A comparison study of pain relief from dysmenorrhea between a vibrating tampon and ibuprofen

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Objectives

- Define and explain the physiology and treatment of dysmenorrhea
- Introduce the use of vibration as a novel treatment therapy for dysmenorrhea
- Outline the results of a USA clinical study of the vibrating tampon vs Ibuprofen
- Provide insights into the practice experience report (PER) in Switzerland

Dysmenorrhea

Dysmenorrhea

Onset with or shortly prior to menstruation
lasting 1-2 days.
Spasmodic pain over background of constant lower abdominal pain
Radiates to the back or anterior and/or medial thigh

Associated sx:
Nausea/Vomiting 89%
Diarrhea 60%
Headache 45%
Fatigue /Malaise 80%

Dysmenorrhea

- Peaks in late adolescence 80%
- Incidence decreases with age and parity
- 50% women suffer monthly
- 10% women incapacitated with pain
- $600 million lost work hours in US alone

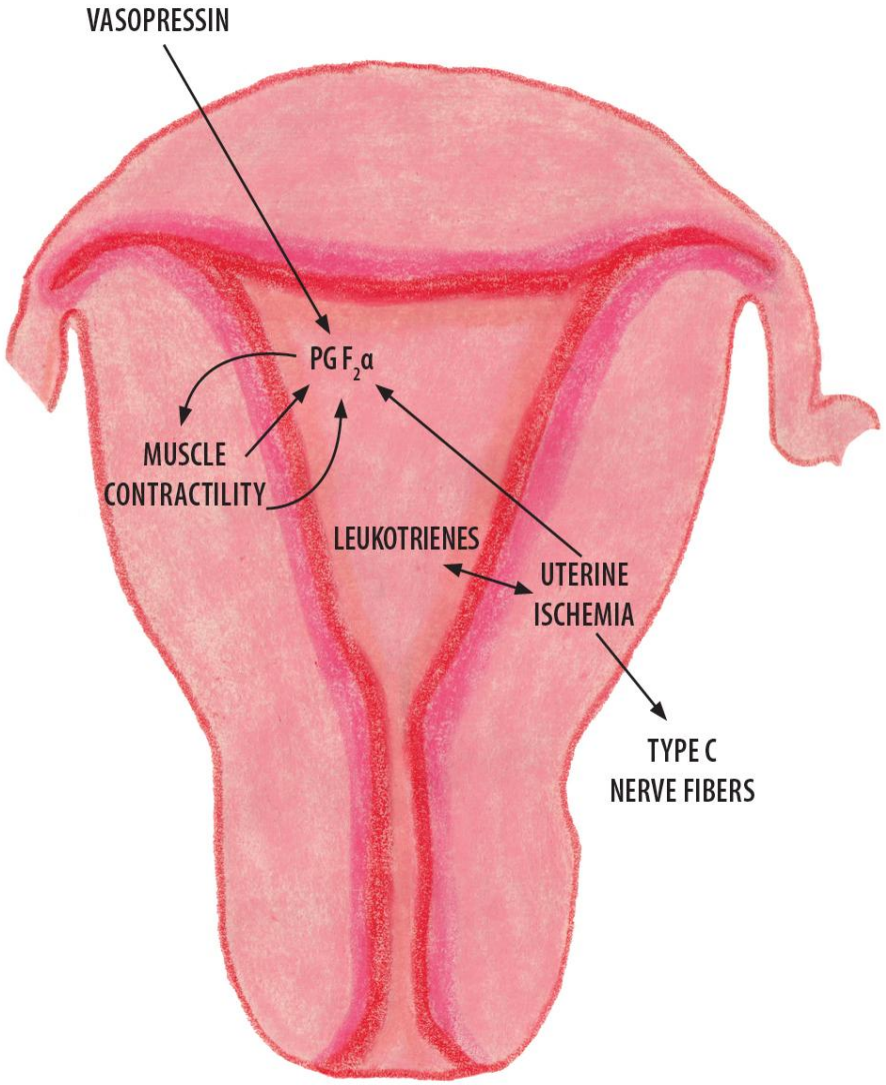
Classification of pain

verbal multidimensional scoring system (VMS)

Grade
Grade 0: Menstruation is not painful and daily activity is unaffected
Grade 1: Menstruation is painful but seldom inhibits the woman's normal activity. Analgesics are seldom required. Mild pain
Grade 2: Daily activity affected. Analgesics required and give relief so that absence from work or school is unusual. Moderate pain
Grade 3: Activity clearly inhibited. Poor effect of analgesics. Vegetative symptoms, e.g. headache, tiredness, nausea, vomiting and diarrhea. Severe pain

http://www.academicjournals.org/ajpp/PDF/pdf2012/22%20O

PATHOPHYSIOLOGY OF DYSMENORRHEA



VASOPRESSIN
mediates production of prostaglandins

PROSTAGLANDIN $F_2\alpha$
potent vasoconstrictor
uterine muscle stimulant

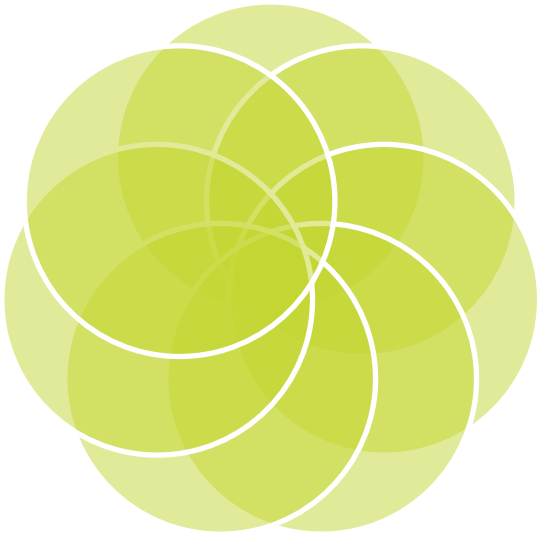
LEUKOTRIENES
stimulates Type C nerve fibers

Treatments for dysmenorrhea

Analgesics esp NSAIDS
(OTC and on prescription)

Surgical intervention

Hormones
(e.g. contraceptive pill)



Home remedies
(e.g. hot-water bottle)

Plant-based products
(e.g. chaste tree,
silverweed,
lady's mantle, etc.)

Preparations
containing magnesium
or iron

**Sport/massage/
relaxation exercises**

Alternative methods of treatment
(e.g. acupuncture or acupressure tens unit)

Vibration:
A new treatment approach

Tamia

...a novel and unique approach

Outside controller with
embedded battery 1.5 V

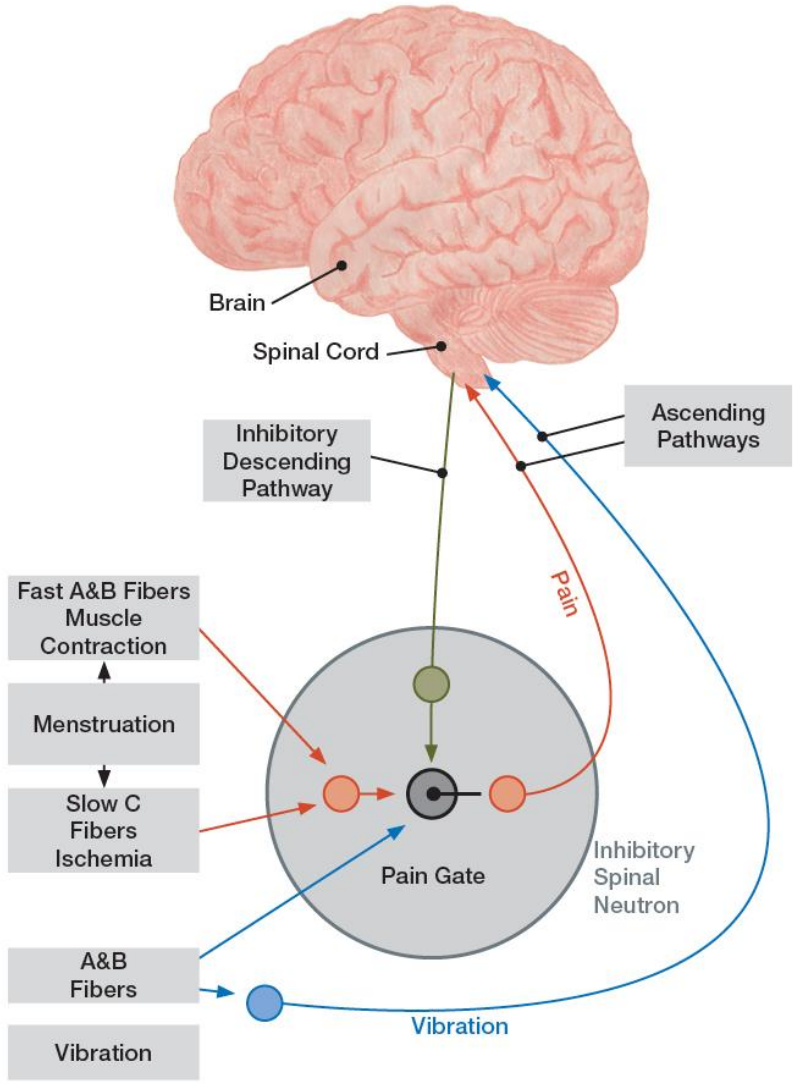
Tampon with embedded vibratory
microunit

Light absorbency one droplet

How does vibration work to treat period pain?

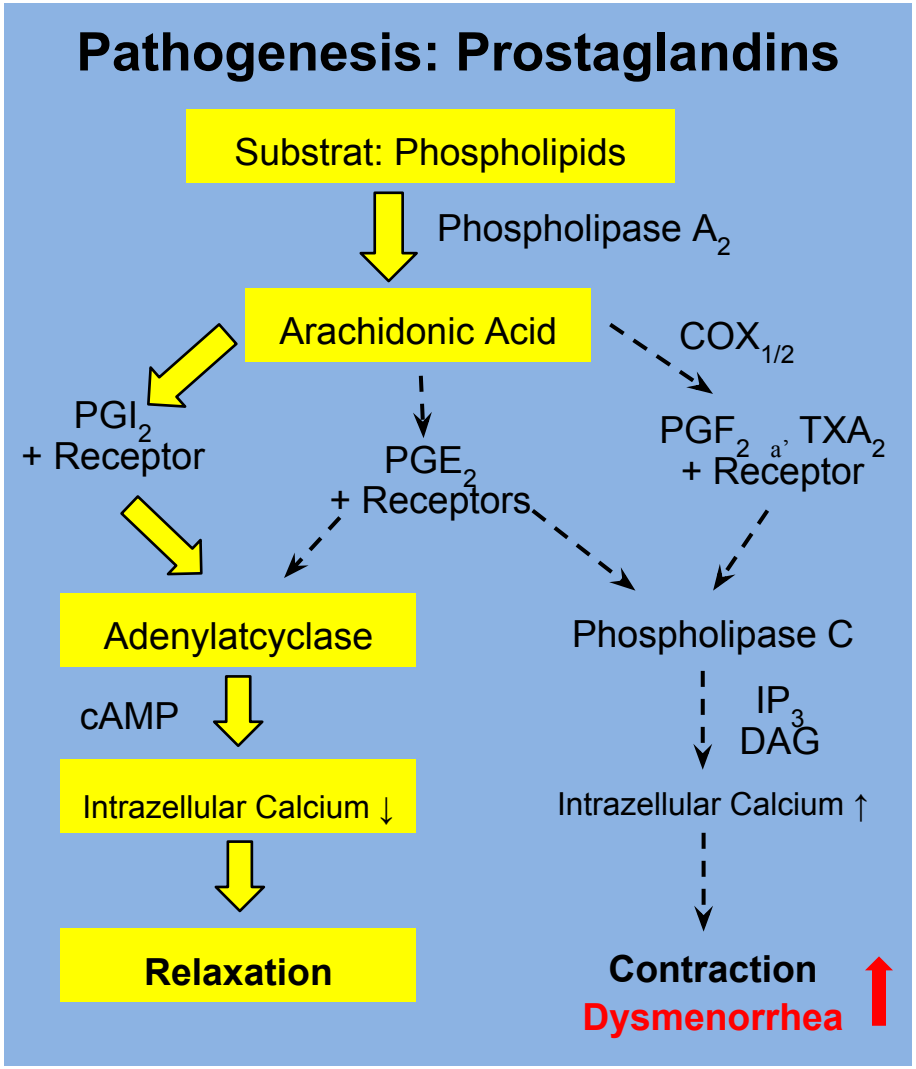
Hypothesis I

Gate theory of pain



How does vibration work to treat period pain?

Hypothesis II
Modulation of Prostaglandins



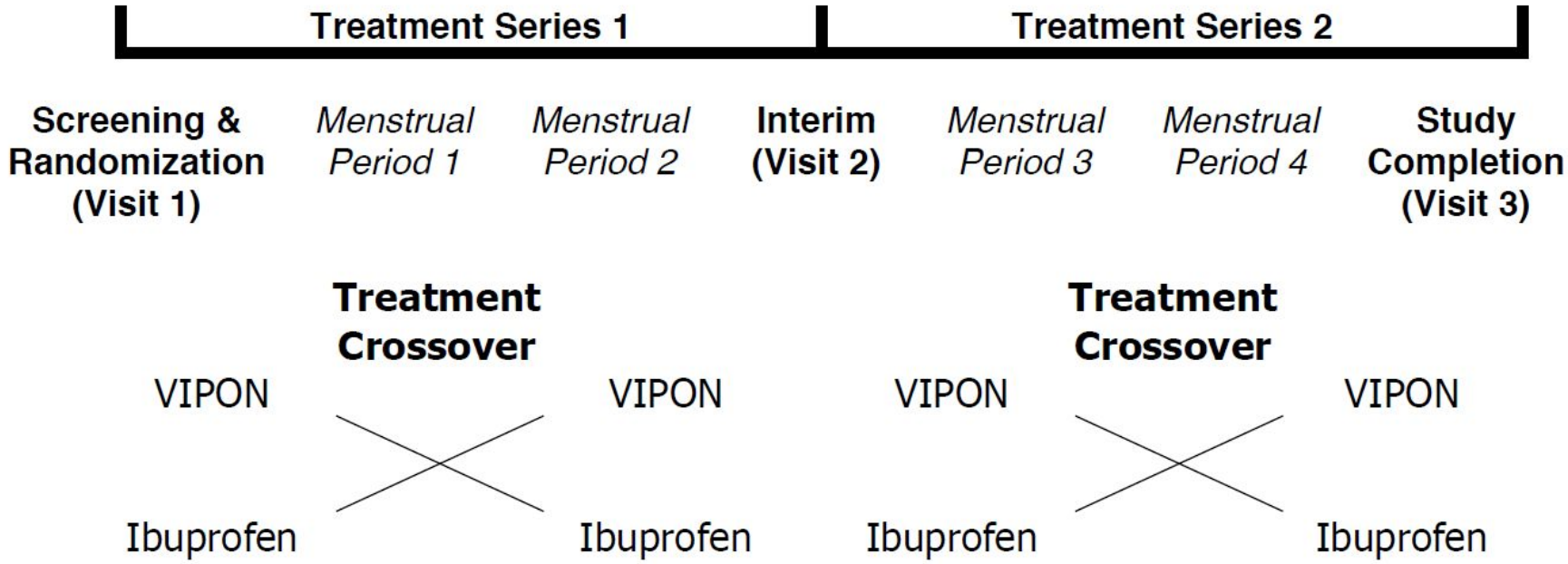
Courtesey of Prof. HP Zahradnik

Vibrating tampon vs Ibuprofen: Results of USA clinical study

A Randomized Four-Way Crossover Comparison Study of Pain Relief from Dysmenorrhea Between the VIPON Tampon and Ibuprofen

- Randomized open label prospective non-inferiority study comparing vibratory tampon (referred to as VIPON) through direct intravaginal application with OTC Ibuprofen for relief of menstrual pain
- Conducted at 2 academic medical centers in the Midwestern United States
- Approved by the institutional review committees at each site and registered with www.clinicaltrials.gov

Four-way crossover study design



Ibuprofen doses: 200-400 mg.

Inclusion/Exclusion

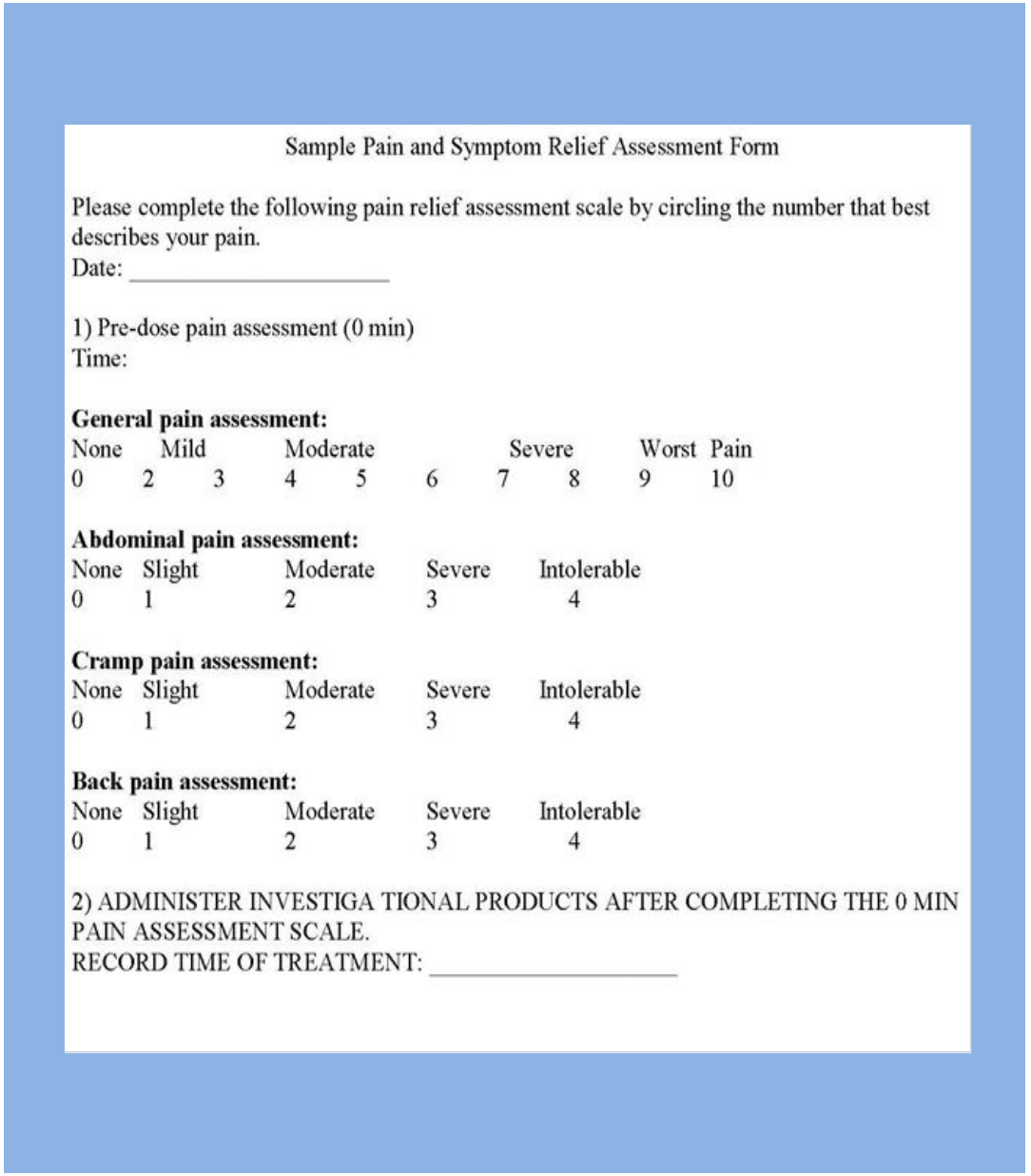
- Study Population: Women age 18 or greater with self-reported dysmenorrhea.
- Inclusion:
  - history of regular menstrual cycles for at least 4 months preceding the study,
  - reliable contraception use
  - willingness to use tampons for collection of menstrual flow
  - medical ability to use Ibuprofen.
- Exclusion:
  - pregnancy,
  - allergic to ibuprofen,

Pain Assessment

Onset of menstrual pain subjects were instructed to complete pain scale

Pain was reported15min.,30 min.,1 hr., 2hr., 8 hr.

Rescue medication was permitted at 2 hrs. if needed



Sample Pain and Symptom Relief Assessment Form

Please complete the following pain relief assessment scale by circling the number that best describes your pain.

Date: _____

1) Pre-dose pain assessment (0 min)

Time:

General pain assessment:

None		Mild		Moderate			Severe		Worst Pain
0	2	3	4	5	6	7	8	9	10

Abdominal pain assessment:

None	Slight	Moderate	Severe	Intolerable
0	1	2	3	4

Cramp pain assessment:

None	Slight	Moderate	Severe	Intolerable
0	1	2	3	4

Back pain assessment:

None	Slight	Moderate	Severe	Intolerable
0	1	2	3	4

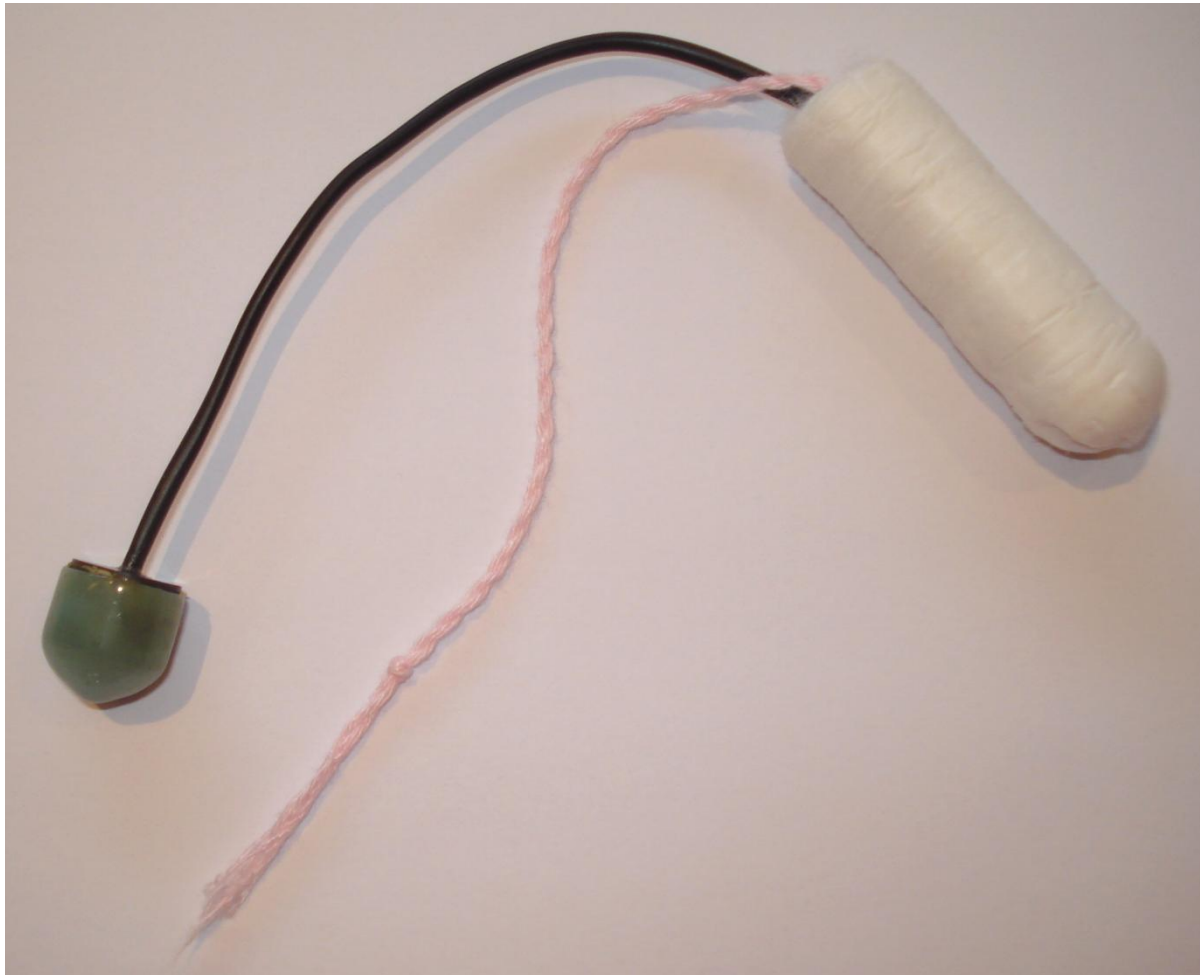
2) ADMINISTER INVESTIGA TIONAL PRODUCTS AFTER COMPLETING THE 0 MIN PAIN ASSESSMENT SCALE.

RECORD TIME OF TREATMENT: _____

Study population

Variable		01 Univ of Kansas Medical Center (n=51)	02 Truman Medical Center (n=64)	Total (n=115)
Age (years)	Mean ± Std Dev Range	31.2 ± 7.3 18.9 – 45.9	32.8 ± 8.7 18.1 – 48.1	32.1 ± 8.1 18.1 – 48.1
Weight (lbs)	Mean ± Std Dev Range	172.0 ± 57.1 74.0 – 312.0	169.8 ± 49.1 106.0 – 347.0	170.8 ± 52.6 74.0 – 347.0
Height (in)	Mean ± Std Dev Range	64.7 ± 2.2 59.0 – 71.0	64.5 ± 2.9 53.0 – 70.0	64.6 ± 2.6 53.0 – 71.0
Race	White Black Asian East Indian West Indian Indian Mulatto	34 (66.7%) 16 (31.4%) 0 (0.0%) 1 (2.0%) 0 (0.0%) 0 (0.0%) 0 (0.0%)	33 (51.6%) 26 (40.6%) 2 (3.1%) 0 (0.0%) 1 (1.6%) 1 (1.6%) 1 (1.6%)	67 (59.2%) 42 (36.5%) 2 (1.7%) 1 (0.9%) 1 (0.9%) 1 (0.9%) 1 (0.9%)

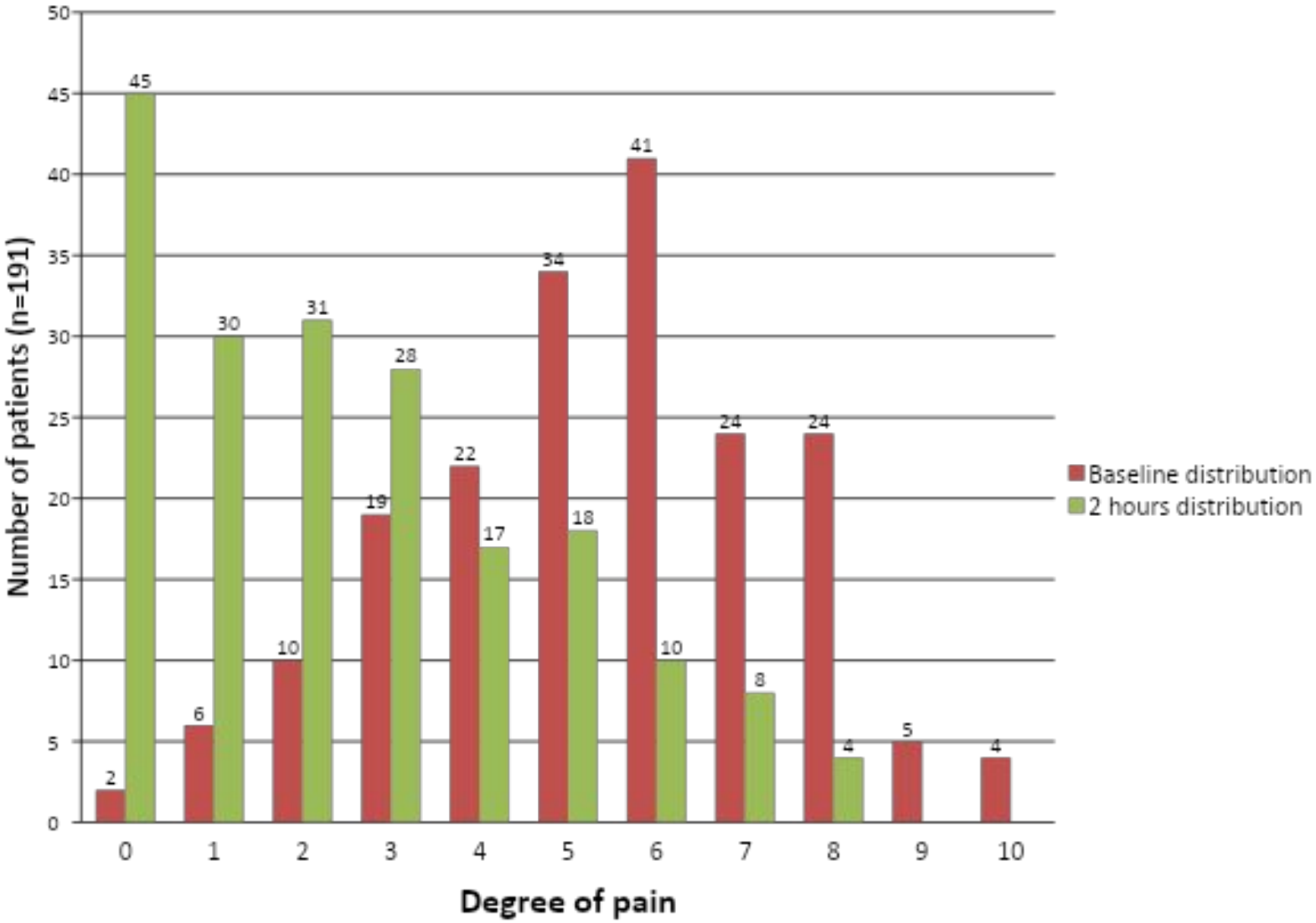
Prototype investigational device used in study



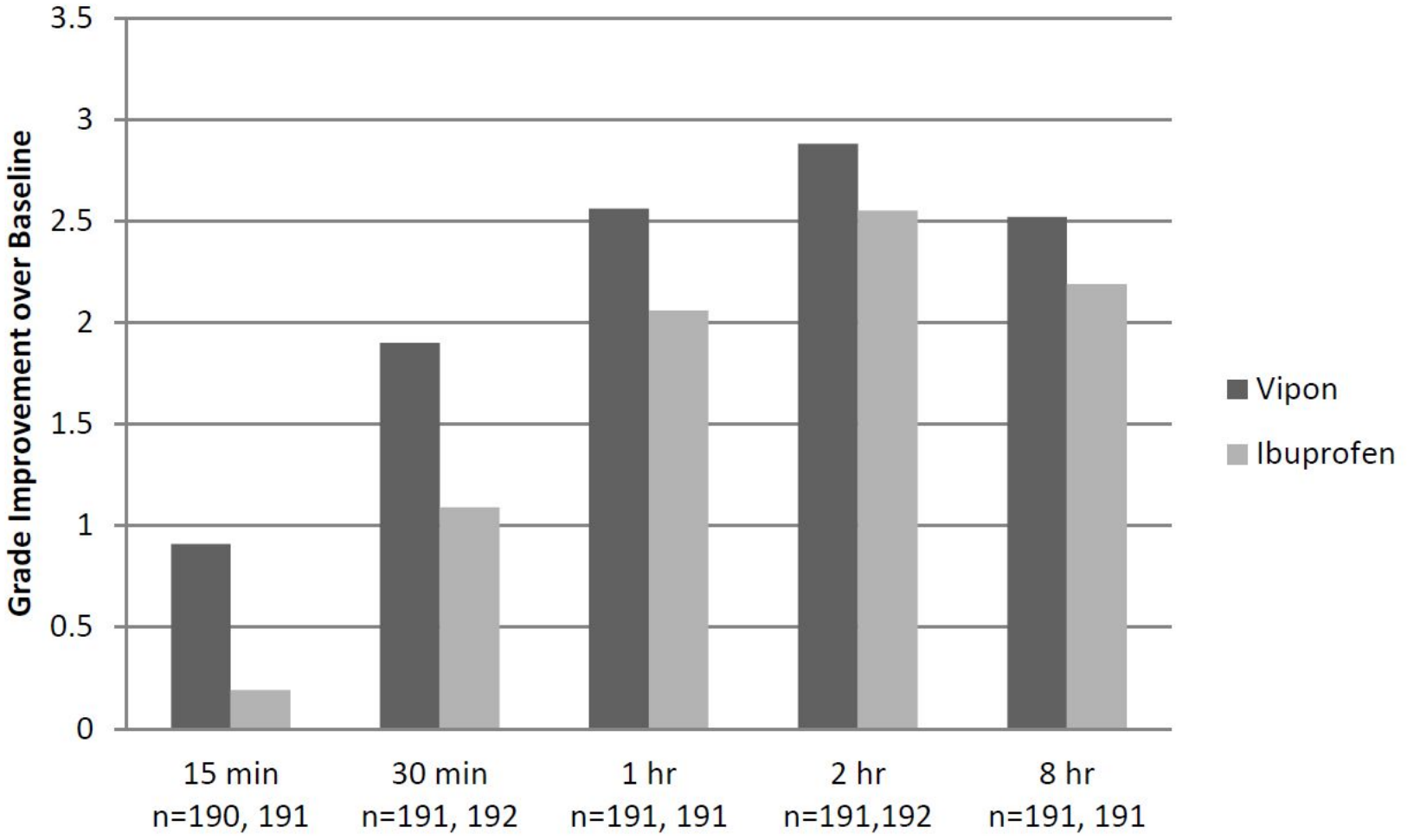
Comparison of methods

Timepoint	Tamia®	Ibuprofen	Effect size[1] (95% CI)	p value
Overall			0.56 (0.37, 0.76)	<0.0001
15 minutes	0.91	0.19	0.74 (0.44, 1.04)	<0.0001
30 minutes	1.90	1.09	0.84 (0.46, 1.21)	<0.0001
1 hour	2.56	2.06	0.53 (0.08, 0.97)	0.0205
2 hours	2.88	2.55	0.36 (-0.12, 0.84)	0.1427
8 hours	2.52	2.19	0.36 (-0.14, 0.86)	0.1619

Change of pain of Vipon users after 2 hours



Mean pain reduction over time



Reduction in specific pain symptoms

Pain Measurement	Time Point	VIPON Mean Score Change (Baseline-Time point)	Ibuprofen Mean Score Change (Baseline-Time point)	Treatment Effect Mean score Change (95% CI)	p-value
Abdominal	**Overall**	N/A	N/A	**0.20 (0.12, 0.28)**	**<0.0001**
	15 minutes	**0.36**	**0.06**	**0.30 (0.17, 0.43)**	**<0.0001**
	30 minutes	**0.73**	**0.45**	**0.29 (0.11, 0.46)**	**0.0011**
	1 hour	0.99	0.84	0.15 (-0.04, 0.34)	0.1287
	2 hours	1.09	1.01	0.09 (-0.11, 0.29)	0.3898
	8 hours	0.99	0.83	0.16 (-0.04, 0.36)	0.1218

Abbreviation: CI = confidence interval.

Reduction in specific pain symptoms

Pain Measurement	Time Point	VIPON Mean Score Change (Baseline-Time point)	Ibuprofen Mean Score Change (Baseline-Time point)	Treatment Effect Mean score Change (95% CI)	p-value
Cramps	**Overall**	N/A	N/A	**0.25 (0.17, 0.34)**	**<0.0001**
	15 minutes	**0.47**	**0.07**	**0.40 (0.26, 0.54)**	**<0.0001**
	30 minutes	**0.92**	**0.50**	**0.43 (0.25, 0.61)**	**<0.0001**
	1 hour	1.07	0.92	0.16 (-0.04, 0.36)	0.1207
	2 hours	1.15	1.11	0.05 (-0.16, 0.25)	0.6360
	8 hours	1.04	0.83	0.22 (-0.002, 0.435)	0.0520

Abbreviation: CI = confidence interval.

Reduction in specific pain symptoms

Pain Measurement	Time Point	VIPON Mean Score Change (Baseline-Time point)	Ibuprofen Mean Score Change (Baseline-Time point)	Treatment Effect Mean score Change (95% CI)	p-value
Back	**Overall**	N/A	N/A	**0.21 (0.13, 0.29)**	**<0.0001**
	15 minutes	**0.24**	**0.02**	**0.23 (0.10, 0.35)**	**0.0005**
	30 minutes	**0.60**	**0.23**	**0.37 (0.19, 0.54)**	**<0.0001**
	1 hour	0.71	0.54	0.18 (-0.01, 0.37)	0.0677
	2 hours	0.78	0.69	0.10 (-0.11, 0.30)	0.3451
	8 hours	0.69	0.52	0.17 (-0.03, 0.37)	0.0876

Abbreviation: CI = confidence interval.

Adverse events

- 80% cycles had no adverse events reported
- Two serious adverse events reported: pregnancy and acute appendicitis
- No adverse events reported could be determined to have a causal relationship
- Local vaginal complaints reported in < 1% cases (vaginal mycosis)

A Randomized trial comparing the VIPON tampon and ibuprofen for dysmenorrhea pain relief

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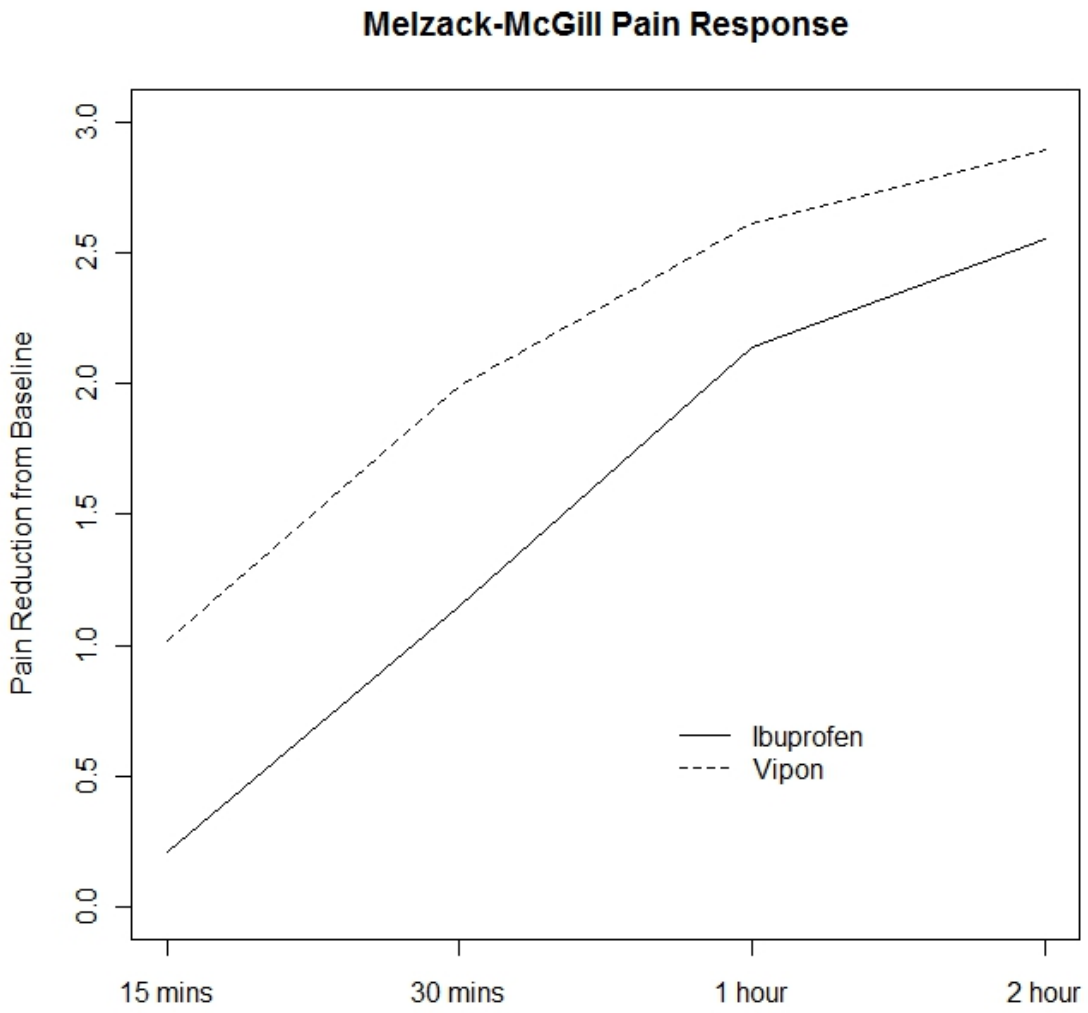
Statistical Analysis

- Primary endpoint variable: Intensity of pain 2 hours post treatment
- Hierarchical linear fixed model with change in base-line to post-treatment time.
- The greater VIPON and ibuprofen pain relief change defined greater pain reduction.
- Non-inferiority limit set prospectively at -10%

Results



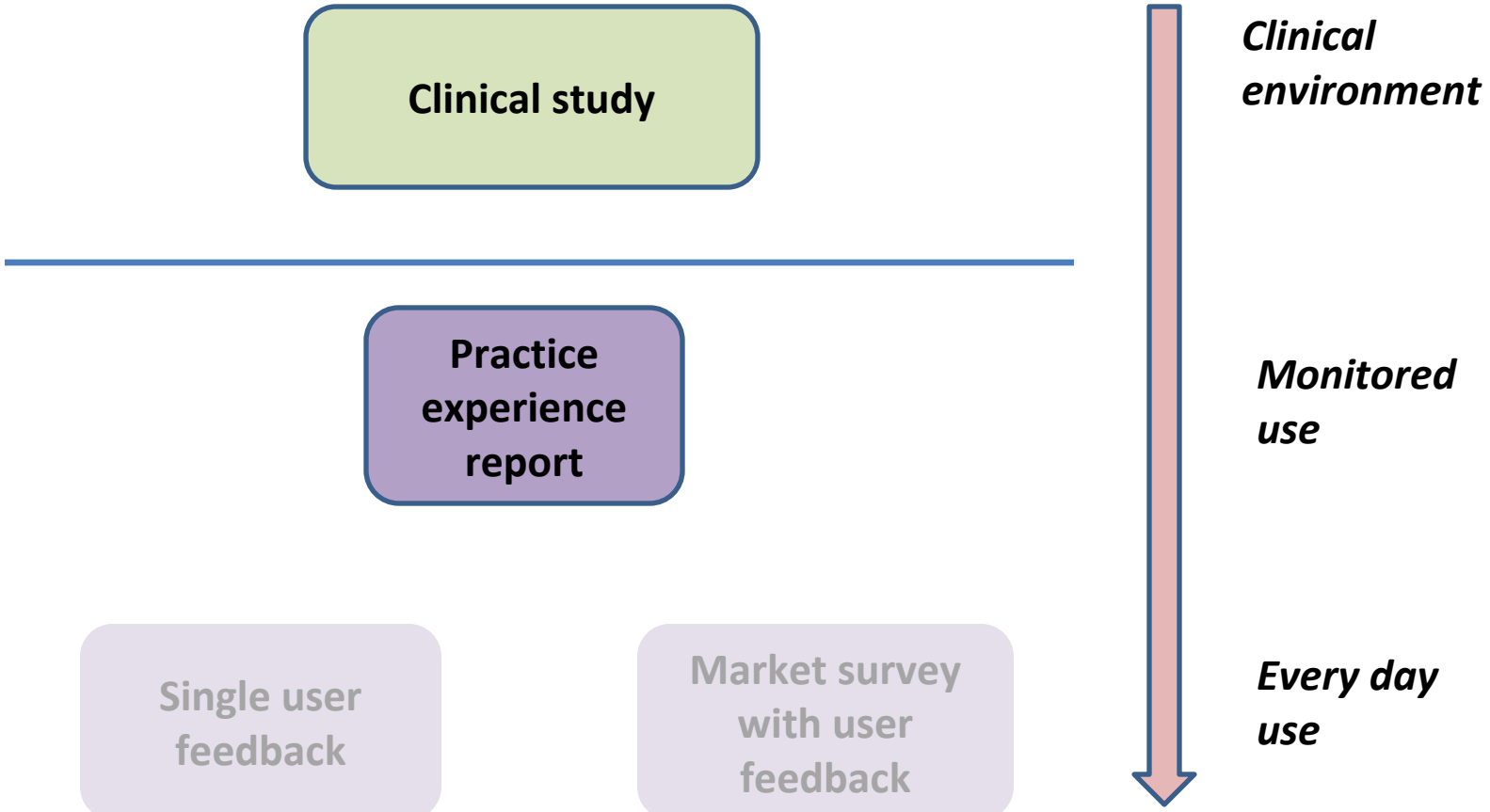
375 cycles
102 patients

Conclusion from clinical trial

- Tamia is as effective as ibuprofen for pain relief ($p<0.010$)
- During the first hour after starting treatment, Tamia reduces pain statistically significantly faster than ibuprofen.
- Compared to ibuprofen, Tamia also provides more rapid relief from additional pain symptoms such as backache in the first 30 minutes.
- Average median and mean pain reduction when using Tamia is higher than with ibuprofen
- More than 50% of participating women were completely pain-free or almost pain-free one to two hours after using Tamia.

Insights into practice experience report (PER) in Switzerland

Efficacy monitoring



Practice experience report (PER) from gynaecologists in Switzerland

- Participants: 50 patients aged 16-47 (mean 28.8 years), 82 evaluable cycles
- Practice based care by 8 gynaecologists who gave Tamia to patients with primary dysmenorrhea.
- Patients were given 2 tampons (tampon1 for first menstrual cycle and tampon2 either as additional treatment in same cycle or for use in subsequent cycle)
- The patients completed a questionnaire with regard to alleviation of pain and satisfaction

Practice experience report (PER)

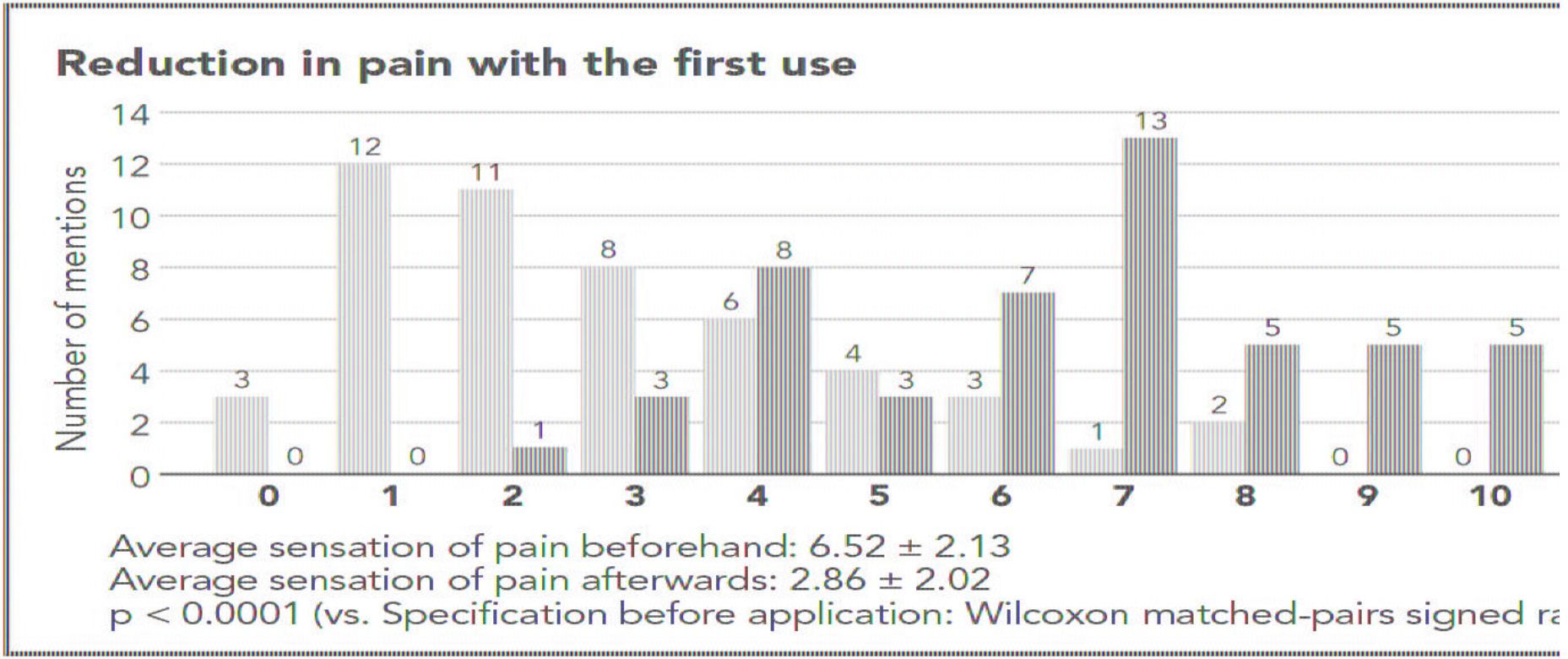


Figure 2: Pain before and after the first use of Tamia

Pain related findings from PER

- Tamia achieved a highly significant pain reduction ($p < 0.0001$).
- In more than 2/3 of patients, the pain-relieving effect occurred within 45 minutes.
- 40% of the women were completely pain-free after the treatment
- 66% of the women stated that treatment with Tamia was equal to or better than their previous treatment methods.
- More than half of the participants did not require any additional medication.
- For 75% of the women, one Tamia application per menstrual period was sufficient to treat their pain successfully.

Satisfaction with Tamia

- The majority of users stated that they were satisfied or very satisfied with the Tamia treatment method.
- A large majority of the women rated Tamia as very simple or simple to use.
- 75% of the users stated that they would recommend Tamia to a friend or their own daughter.
- The majority of users mentioned that Tamia had a positive impact on their quality of life.
- For many the reduced use of or abstention from painkillers is the most important advantage of the product.

Tamia

- Tamia offers a new approach to the treatment of period pain that:
  - Is safe
  - Is as effective as Ibuprofen and works more rapidly
  - Is long lasting
  - Allows freedom from pharmacologic treatment
  - Is easy to use
  - Has high user acceptance

- Tamia is treatment for the future


Tamia
Tamia®
Wirkt gegen Menstruationsschmerzen
Efficace contre les douleurs des règles
Agisce contro i dolori mestruali