Essex Testing Clinic, Inc.

FINAL REPORT

A DOUBLE-BLIND, PLACEBO CONTROLLED CLINICAL EFFICACY EVALUATION OF A PATCH TO SOOTHE KNEE PAIN

IceWave Y
IceWave X

Sponsor

LIFEWAVE PRODUCTS, LLC
1020 Prospect Street, Suite 200
La Jolla, CA 92037

Sponsor Representatives

David Schmidt, CEO

Dr. Steve Haltiwanger
Science Director

Clinical Testing Facility

Essex Testing Clinic, Inc.
799 Bloomfield Avenue
Verona, NJ 07044

Sponsor Code: L51
ETC Panel No.: 09361
ETC Entry Nos.: 17872.01-.02

Date of Final Report

ETC Panel No.: 09361
ETC Entry Nos.: 17872.01-.02

SIGNATURE PAGE

A DOUBLE-BLIND, PLACEBO CONTROLLED CLINICAL EFFICACY EVALUATION OF A PATCH TO SOOTHE KNEE PAIN

IceWave Y
IceWave X

_____ _____
Annemarie E. Hollenback, BA Date
Laboratory Manager
Study Director

_____ _____
Toni F. Miller, PhD, DABT, BCFE Date
Scientific Director
Principal Investigator

QUALITY ASSURANCE STATEMENT

This study was conducted in accordance with the intent and purpose of Good Clinical Practice regulations described in CFR Title 21, Parts 50, 56 and 312 and/or the Declaration of Helsinki, as appropriate.

For purposes of this clinical study:

__X__ Informed Consent was obtained.

_____ Informed Consent was not obtained.

_____ An IRB review was not required.

__X__ An IRB review was conducted and approval to conduct the proposed clinical research was granted.

This study report has been reviewed to assure that it correctly describes the methods of testing and that the reported results accurately reflect the data obtained during the clinical study (ETC Panel No.: 09361; ETC Entry Nos.: 17872.01-.02).

_____ _____

Sherri L. Sayles, MS Date
Manager, Quality Assurance

TABLE OF CONTENTS

A DOUBLE-BLIND, PLACEBO CONTROLLED CLINICAL EFFICACY EVALUATION OF A PATCH TO SOOTHE KNEE PAIN

IceWave Pain Patch (Active)
IceWave Pain Patch (Placebo)

1.0 OBJECTIVE

The objective of this was to determine if the use of a patch reduces pain in subjects with self-perceived arthritic knee pain in one knee after 2 days of use in a study of 60 volunteers, aged 35-75 years, and to compare its effects to a placebo. One-half of the participants used the active test patch and the remaining half used a placebo patch.

2.0 SPONSOR

LIFEWAVE PRODUCTS, LLC
1020 Prospect Street, Suite 200
La Jolla, CA 92037

2.1 Sponsor Representatives

David Schmidt, CEO

Dr. Steven Haltiwanger
Science Director

3.0 CLINICAL INVESTIGATORS

Study Director:	Annemarie E. Hollenback, BA Laboratory Manager
Principal Investigator:	Toni F. Miller, PhD, DABT, BCFE Scientific Director

4.0 CLINICAL TESTING FACILITY

Essex Testing Clinic, Inc.
799 Bloomfield Avenue
Verona, NJ 07044

5.0 STUDY DATES

Baseline (Day 0) Visit:	January 18, 2010
Day 2 Visit:	January 20, 2010
Day 5 Visit:	January 23, 2010

6.0 ETHICS

6.1 Ethical Conduct of the Study

This study was conducted in accordance with the intent and purpose of Good Clinical Practice regulations described in Title 21 of the U.S. Code of Federal Regulations (CFR), the Declaration of Helsinki and/or Essex Testing Clinic (ETC) Standard Operating Procedures (SOPs).

6.2 Subject Information and Consent

This study was conducted in compliance with CFR Title 21, Part 50 (Informed Consent of Human Subjects). Informed Consent was obtained from each subject in the study and documented in writing before participation in the study. A copy of the Informed Consent was provided to each subject.

6.3 Institutional Review Board

This study (and any modification) and appropriate consent procedures, were reviewed and approved by an independent Institutional Review Board (IRB). A letter or certificate of approval was sent by the Investigator/Study Director to the Sponsor prior to study initiation.

7.0 TEST ARTICLE

The test articles used in this study were provided by:

LIFEWAVE PRODUCTS, LLC
1020 Prospect Street, Suite 200
La Jolla, CA 92037

They were received on December 18, 2009 and identified as follows:

ETC Entry No.	Qty Received	Test Article I.D.	Physical Description
17872.01	132 patches	IceWave X	White and green circular patches
17872.02	132 patches	IceWave Y	White and green circular patches

8.0 TEST SUBJECTS

A sufficient number of subjects ranging in age from 35 to 75 years were empanelled for the home-use testing procedure so that approximately 60 subjects would complete the study. (30 subjects used the active patch and the remaining half used the placebo patch).

Each panelist was to read, understand and sign a written Informed Consent Form and complete a brief Medical History Form.

9.0 STUDY DESIGN

9.1 Overall Study Design

The study was a 5-day, double-blind, placebo controlled study. A sufficient number of subjects meeting the inclusion/exclusion criteria were enrolled so that approximately 60 subjects completed the test procedure. (30 subjects in active cell; 30 subjects in placebo cell).

9.2 Subject Selection

A sufficient number of individuals, between 35 and 75 years of age (inclusive) and in general good health, were empanelled so that at least 60 completed the study (30 in the active test have a minimum, self-perceived arthritic pain level of "5" according to a ten-point scale (0-no pain; 9=severe pain) in one knee. All subjects were required to read, understand and sign a written Informed Consent and a complete a brief demographic Medical History Form. Subjects assess their pain at baseline, on Day 1 (prior to treatment) and on Day 3 (during treatment).

9.2.1 Inclusion Criteria

1. Male and female individuals between the ages of 35 and 75 years (inclusive) in general good health (no physical required).
2. Individuals with a minimum, self-perceived arthritic pain level of "5" according to a ten-point scale (0=no pain; 9=severe pain in one knee.
3. Individual indicated their willingness to participate in the study, follow directions and to stay on the study for the full 4 days.
4. Individuals who had not been on any OTC treatment programs for arthritis pain within 2 weeks prior to the individual of the study and who agree to refrain from taking any pain relievers during the course of the study.
5. Individuals who read, understood and signed the Informed Consent Form.

9.2.2 Exclusion Criteria

1. Any individual did not met the inclusion criteria.
2. Women who were pregnant, planning a pregnancy, lactating and/or nursing a child
3. Individual with a known sensitivity to cosmetics, adhesive tapes or personal care products.
4. Individuals with a know sensitivity to any of the components of the test patches.
5. Individuals using a OTC or prescription treatment programs for arthritis within 2 weeks of to study initiation, systemic or topical anti-inflammatory agents or OTC acetaminophen (eg, Tylenol), 8
6. Individuals who cannot agree to refrain from taking pain relievers, systemic or topical anti-inflammatory agents, OTC acetaminophen (e.g., Tylenol), ibuprofen (e.g., Advil) or aspirin during the course of the study.

9.0 STUDY DESIGN (CONT'D)

9.2 Subject Selection (Cont'd)

7. Individuals with any systemic disorder included a known history of allergies which in the opinion of the Investigator could have interfered with the conduct of the study, interpretation of results or increase the risks of an adverse reaction
8. Individuals taking other medications that might have interfered with the test results.
9. Individuals who participated on another study where the legs are the target area 2 weeks prior to study initiation.
10. Individuals with pacemakers.

9.3 Test Procedure

The following chart outlines the study schedule:

VISIT	PROCEDURE
Day 0	Informed Consent and Medical History Collected. Subjects who indicate minimum arthritic pain level of "5" or greater on one knee and who meet all inclusion/exclusion criteria will be enrolled.
Day 1	Enrolled subjects will rate their pain (prior to any treatment) during Day 1 (at pre-designated time points) on a pain assessment daily diary.
Day 2	Subjects return Day 1 diary and will be randomized to receive either the placebo or active pain patch to wear for the duration of the study. Subjects will receive 2 pain patches (both active OR both placebo) and a Day 3 and Day 4 pain assessment daily diary.
Day 3	Subjects wear 1st designated pain patch (active or placebo) on Day 3 and rate their pain on the pain assessment daily diary.
Day 4	Subjects wear 2nd designated pain patch (active or placebo) or Day 4 and rate their pain on the pain assessment daily diary.
Day 5	Subjects return Day 3 and Day 4 pain assessment daily diaries to Testing Facility and are discharged from study.

On Day 0, prior to study enrollment, potential panelists completed an Informed Consent Form and a Medical History Form. Individual who appeared to meet the study criteria based on Medical History review were asked to indicate the level of pain in one of their knees. In order to qualify subjects were required to have a minimum arthritic pain level of "5", according to a 10-paint scale (0=no pain; 9=severe pain) in one knee. Enrolled subjects were given a dairy and they were asked to rate their pain in the same knee a several time-points the following day (Day 1). Subjects were asked to rate their pain upon getting out of bed in the morning, in the early afternoon, in the early evening, before going to bed (an overall assessment of pain experienced during the day).

Subjects returned to the Testing Facility on Day 2 to return their diary. Subjects were given two active test patches or two placebo patches and a new diary. Upon waking the next morning (on Day 3) subjects applied the first patch to the same knee according to the Sponsor's use instructions before getting out of bed in the morning. After remaining in bed for a pre-determined time, subjects got out of bed and subjects rated their pain at the same time intervals on Day 1. Subjects repeated the procedure with the second patch on Day 4. Subjects returned to the Testing Facility on Day 5 to return their pain assessment diaries.

9.0 STUDY DESIGN (CONT'D)

9.3.1 Baseline (Day 0) Evaluation

Subjects reported to the Testing Facility on Day 0 for the baseline visit. Subjects were asked to select the right or left knee and to rate the level of arthritic pain they perceive in that knee according to the following 10-point scale.

Please circle the level of pain you are experiencing in your knee:

|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
0 1 2 3 4 5 6 7 8 9

0= No pain 9=Severe pain

Subjects with a score of "5" or greater in one knee were enrolled. Enrolled subjects received a pain assessment daily diary and were asked to rate their pain at designated times of the day on Day 1 (prior to receiving any treatment).

9.3.2 Day 1 Evaluation

Subjects were given the following pain assessment daily diary instructions to follow on Day 1 (prior to receiving any treatment):

Beginning with when you first get out of bed tomorrow, you will rate the pain you experience in the designated knee on the scales below. For each scale, please circle only one number.

1. Please circle the level of pain you experienced **upon first getting out of bed**:

|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
0 1 2 3 4 5 6 7 8 9

0= No pain 9=Severe pain

2. Please circle the level of pain you experienced **in the early afternoon**:

|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
0 1 2 3 4 5 6 7 8 9

0= No pain 9=Severe pain

3. Please circle the level of pain you experienced **in the early evening**:

|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
0 1 2 3 4 5 6 7 8 9

0= No pain 9=Severe pain

4. Please circle the level of pain you experienced **prior to going to bed**:

|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
0 1 2 3 4 5 6 7 8 9

0= No pain 9=Severe pain

5. Please circle the **OVERALL level of pain you experienced today**:

|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
0 1 2 3 4 5 6 7 8 9

0= No pain 9=Severe pain

9.0 STUDY DESIGN (CONT'D)

9.3.3 Day 2 Visit

Subjects reported to the Testing Facility on Day 2. Day 1 diaries were collected and subjects will receive either the test product or placebo product (products will be distributed according to a randomization). Subjects also received a Day 3 and a Day 4 pain assessment diary identical to the diary that was completed on Day 1.

Subjects were instructed to use the test products the next two days (Day 3 and Day 4).

9.3.4 Day 3 and Day 4 Evaluations

On Day 3 and Day 4, subjects applied the active test patch or placebo patch according to the following instructions:

DIRECTIONS:

First thing in the morning, apply the patch to clean, dry skin on the designated knee.
Apply WHITE patch to the OUTSIDE of the painful knee.
Apply DARK patch to the INSIDE of the same, painful knee.
LEAVE PATCH IN PLACE FOR 12 HOURS.

During the time you are wearing the patch, please complete the pain assessment diary at the indicated time intervals.

Once subjects applied the patch, they began rating their pain in exactly the same manner and at the same time points as Day 1. Additionally, there was a space provided on the diary for subjects to record comments (if any).

9.3.5 Day 5 Visit

Subjects reported to the Testing Facility on Day 5 to return their diaries. Subjects were discharged from the study.

10.0 RESULTS AND DISCUSSION

Sixty-two (62) subjects, 55 females and 7 males between the ages of 38 and 74 were empanelled. A total of sixty-two (62/62) test panelists successfully completed the test procedure. Subject demographics are presented in Appendix 1.

The following table summarizes the demographics breakdown for the two test cells:

Test Articles	# of Subjects Enrolled/Completed	Males	Females	Age Range
IceWave X	31/31	4	27	39-74
IceWave Y	31/31	3	28	38-73

10.0 RESULTS AND DISCUSSION (CONT'D)

10.1 Day 0 – Qualification Pain Assessment

On Day 0, prior to study enrollment, potential subjects who met the study criteria based on Medical History review, were asked to indicate the level of pain in one of their knees. In order to qualify and be enrolled on to the study, subjects were required to have a minimum, arthritic pain level of "5" according to a 10-point scale (0=no pain; 9=severe pain. Individual subject qualification scores are presented in Appendix 2.

The following table presents a summary of mean qualification scores for subjects in each test group.

Mean Qualification Scores

	IceWave X	IceWave Y
Mean Score	6.8	6.6

These scores were used for enrollment purposes only and were not used in determining the efficacy of either test product.

10.2 Day 1 – Mean Pain Assessments

Enrolled subjects were given a pain assessment diary and were asked to rate the their pain at several pre-determined timepoints on Day 1, prior to receiving any treatment

The following table presents a summary of Day 1 mean pain assessment scores.

DAY 1

Mean Pain Assessment Scores (Pre-Treatment)
(+ Standard Deviation [S.D.])

	IceWave X (Pre-Treatment)			IceWave Y (Pre-Treatment)		
	Mean ± S.D.	p-Value	% Change from Baseline	Mean ± S.D.	p-Value	% Change from Baseline
Upon first getting out of bed	6.6 ± 1.1	-	-	6.4 ± 1.0	-	-
In the early afternoon	6.4 ± 0.9	0.306	-3.0%	6.4 ± 0.9	0.846	0%
In the early evening	6.8 ± 0.9	0.450	3.0%	6.7 ± 0.9	0.078	4.7%
Prior to going to bed	7.1* ± 0.9	0.031	7.6%	6.9* ± 0.9	0.031	7.8%
Overall pain level for the day	7.0 ± 0.8	0.089	6.0%	6.9* ± 0.9	0.013	7.8%

**Statistically significant change from baseline, $p \leq 0.05$.*

10.0 RESULTS AND DISCUSSION (CONT'D)

10.2 Day 1 – Mean Pain Assessments (Cont'd)

Prior to any treatment, when mean pain assessment scores from baseline (upon first getting out of bed) were compared to mean pain assessment scores for the rest of the day there was:

- A decrease in self-perceived pain in the early afternoon and an increase in self-perceived pain at all other evaluations for subjects that would be assigned to group IceWaveX; and
- No change in self-perceived pain in the early afternoon and an increase in self-perceived pain at all other evaluations for subjects that would be assigned to test group IceWave Y.

Additionally, there was no statistically significant difference observed between the subjects in the IceWave X test group and the IceWave Y test group at any point on Day 1 (prior to receiving treatment).

10.2.1 Frequency of Response

The following table presents a summary of subjects who showed improvement in the Day 1 mean pain assessments.

Day 1 – Mean Pain Assessments (Pre-Treatment)
Frequency of Response
(% of subjects with improvement from Baseline)

	Improvement		No Change or Worsening	
	IceWave X	IceWave Y	IceWave X	IceWave Y
In the early afternoon	39%	39%	61%	61%
In the early evening	29%	26%	71%	74%
Prior to going to bed	26%	23%	74%	77%
Overall pain level for the day	19%	23%	81%	77%

When compared with baseline, the greatest percentage of subjects showed improvement in pain levels in the early afternoon, however both groups showed an increase in pain levels as the day progressed (pre-treatment).

10.3 Day 3 – Mean Pain Assessment

On Day 3, subjects applied the assigned test patch and completed a pain assessment diary assessment diary identical to the diary that was completed on Day 1. Individual scores and statistical analyses are presented in Appendix 4.

10.0 RESULTS AND DISCUSSION (CONT'D)

10.3 Day 3 – Mean Pain Assessment (Cont'd)

The following table presents a summary of the Day 3 mean pain Assessment scores.

DAY 3

Mean Pain Assessment Scores (+ S.D.)

	IceWave X			IceWave Y		
	Mean ± S.D.	p-Value	% Change from Baseline	Mean ± S.D.	p-Value	% Change from Baseline
Upon first getting out of bed	6.7 ± 1.1	-	-	6.7 ± 1.5	-	-
In the early afternoon	5.5* ± 1.7	<0.001	-17.9%	5.5 ± 1.8	<0.001	-17.9%
In the early evening	5.0* ± 1.8	<0.001	-25.4%	5.2 ± 1.7	<0.001	-22.4%
Prior to going to bed	4.8* ± 2.0	<0.001	-28.4%	5.3* ± 1.9	<0.001	-20.9%
Overall pain level for the day	5.1* ± 2.0	<0.001	-23.9%	5.5 ± 1.6	<0.001	-17.9%

**Statistically significant change from baseline, $p \leq 0.05$.*

On Day 3, when mean pain assessment scores from baseline (upon first getting out of bed) were compared to mean pain assessment scores from the test of the day, there was:

- a decrease in self-perceived pain at every evaluation for subjects who used IceWave X. The greatest decrease in pain was observed before going to bed (28.4%). The decreases observed at each time point were highly significant ($p<0.001$) when compared with baseline; and
- a decrease in self-perceived pain at every evaluation for subjects who used IceWave Y. The greatest decrease in pain was in the early evening (22.4%). The decreases observed at each time point were highly significant ($p<0.001$) when compared with baseline.

There was no statistically significant difference observed between the two test groups at any time on Day 3. However, with the exception of the early afternoon evaluation, IceWave X was associated with a higher percentage of subjects reporting a reduction in pain levels as follows:

- a 13.4% greater response in IceWaveX at the evaluation completed in the early evening;
- a 35.9% greater response in IceWaveX at the evaluation completed prior to going to bed; and
- a 33.5% greater response in IceWaveX for the overall pain level for the day.

10.0 RESULTS AND DISCUSSION (CONT'D)

10.3 Day 3 – Mean Pain Assessment (Cont'd)

The following table presents a summary of subjects who showed improvement in the Day 3 mean pain assessments.

Day 3 – Mean Pain Assessments
Frequency of Response
(% of subjects with improvement from Baseline)

	Improvement		No Change or Worsening	
	IceWave X	IceWave Y	IceWave X	IceWave Y
In the early afternoon	61%	58%	39%	42%
In the early evening	84%	81%	16%	19%
Prior to going to bed	81%	74%	19%	26%
Overall pain level for the day	74%	71%	26%	29%

When compared with baseline, the greatest percentage of subjects showed improvement in the early evening for both IceWave X and IceWave Y. However, for both products, the majority of subjects showed improvement at every evaluation.

10.4 Day 4 – Mean Pain Assessment

On Day 4, subjects applied a second patch from the same assigned test group and completed a pain assessment diary identical to the one that was completed on Day 3. Individual scores and statistical analyses are presented in Appendix 5.

The following table presents a summary of the Day 4 mean pain assessment scores.

DAY 4

Mean Pain Assessment (± S.D.)

	IceWave X			IceWave Y		
	Mean ± S.D.	p-Value	% Change from Baseline	Mean ± S.D.	p-Value	% Change from Baseline
Upon first getting out of bed	5.6 ± 1.6	-	-	5.8 ± 1.8	-	-
In the early afternoon	4.6* ± 1.8	<0.001	-17.9%	5.4 ± 1.8	0.068	-6.9%
In the early evening	4.3* ± 1.9	<0.001	-23.2%	5.2* ± 1.8	0.018	-10.3%
Prior to going to bed	4.1*^ ± 2.1	<0.001	-26.8%	5.1*^ ± 1.6	0.006	-12.1%
Overall pain level for the day	4.4*^ ± 2.0	<0.001	-21.4%	5.3*^ ± 1.6	0.010	-8.6%

**Statistically significant change from baseline, p≤0.05.*
^Statistically significant difference between corresponding timepoints, p≤0.05

10.0 RESULTS AND DISCUSSION (CONT'D)

10.4 Day 4 – Mean Pain Assessment (Cont'd)

On Day 4, when mean pain assessment scores from baseline (upon first getting out of bed) were compared to mean pain assessment scores from the rest of the day, there was:

- a decrease in self-perceived pain at every evaluation for subjects who used IceWave X. The greatest decrease in pain was observed prior to going to bed (26.8%). The decreases observed at each time point were highly significant ($p<0.001$) when compared with baseline; and

- a decrease in self-perceived pain at every evaluation for subjects who used IceWave Y. The greatest decrease in pain was observed prior to going to bed (12.1%). The decreases observed were statistically significant ($p<0.05$) when compared with baseline (with the exception of in the early afternoon, which was not statistically significant).

There was a statistically significant difference observed between the products on Day 4 at the assessment completed prior to going to bed and the overall pain assessment for the day, with IceWave X being associated with a higher percentage of subjects reporting a reduction in pain at both of the assessments. Overall, IceWave X showed a reduction in pain levels that was double the reduction observed with IceWave Y at every assessment on Day 4 as follows:

- a 159.4% greater response in IceWave X at the evaluation completed in the early afternoon.
- a 125.2% greater response in IceWave X at the evaluation completed in the early evening;
- a 121.5% greater response in IceWave X at the evaluation completed prior to going to bed, and
- a 148.8% greater response in IceWave X for the overall pain level of the day.

10.4.1 Frequency of Response

Day 4 – Mean Pain Assessments
Frequency of Response
(% of subjects with improvement from Baseline)

	Improvement		No Change or Worsening	
	IceWave X	IceWave Y	IceWave X	IceWave Y
In the early afternoon	61%	45%	39%	55%
In the early evening	74%	65%	26%	35%
Prior to going to bed	77%	61%	23%	39%
Overall pain level for the day	71%	58%	29%	42%

When compared with baseline, the greatest percentage of subjects showed improvement prior to going to bed with IceWave X and in the early evening with IceWave Y. Overall, the subjects who used IceWave X reported a greater improvement in pain levels throughout Day 4.

11.0 CONCLUSIONS

A clinical efficacy study conducted with 62 subjects (31 subjects using **Test Article: IceWave X** and 31 subject using **Test Article: IceWave Y**) showed:

- self-perceived, artthritic knee pain was significantly improved ($p<0.001$) during 2 days of use with **Test Article: IceWave X**; and

- self-perceived, arthritic knee pain was significantly improved during 2 days of use ($p<0.001$ on first day of use; $p<0.05$ on second day of use) with **Test Article: IceWave Y.**

During the course of the study, **Test Article: IceWave X** was associated with a higher percentage of subjects reporting a reduction in overall pain levels. Additionally, there was a statistically significant difference observed between the test articles on the second day of use, with **Test Article: IceWave X** exhibiting a greater decrease in pain levels. During the second day of use, **Test Article: IceWave X** was associated with a level of pain reduction that was greater than double the level of pain reduction observed with **Test Article**: **IceWave Y** at each evaluation.