Propel is the Acceleration Company

• Propel is the only company to provide scientifically proven solutions that accelerate ideal outcomes in all phases of treatment.

• We offer the gold standard, with our patented Excellerator® drivers for MOPs, that allow doctor control while being able to focus on both whole mouth treatments as well as individual tooth movements.

• With VibraPro® we offer the most technologically advanced, cost effective vibration device as an additional tool, for patients that want to participate in accelerating their treatment at home with a minimal 5-minute per day commitment.
Why the “5”? 

★ 5-Minutes Daily Wear Time 

• 5 Ultimate Benefits 
  ① More Efficient Aligner Seating 
  ② Relieves Orthodontic Pain 
  ③ Accelerates Tooth Movement 
  ④ Fast Tracks Retention 
  ⑤ Stimulates Bone Growth and Remodeling
Advantages & Clinical Benefits
Is bone formation induced by high-frequency mechanical signals modulated by muscle activity?

S. Judex and C.T. Rubin

Department of Biomedical Engineering, Stony Brook University, Stony Brook, NY 11794, USA

The hypothesis that bone formation is induced by high-frequency mechanical signals is based on the observation that bone formation is enhanced by mechanical loading. However, the mechanisms by which these signals are transduced into bone formation are not well understood. This study investigates the role of muscle activity in modulating the mechanical signals that induce bone formation. The results suggest that muscle activity can modulate the mechanical signals that induce bone formation, and that this modulation is mediated by high-frequency mechanical signals. The findings have implications for the design of bone augmentation procedures and the development of new therapies for bone loss.

Osteogenic Effect of High-frequency Acceleration on Alveolar Bone

INTRODUCTION

The alveolar process of the jaw supports teeth during function. This bone has significant effects on the health of patients with periodontal disease. Significant resorption of bone also has great impact on clinical dentistry, including removable prostheses and the success of dental implants. The etiological and pathological methods for the maintenance of bone growth in the bone have been studied, but these techniques are invasive, constrained, or limited. Therefore, a significant demand exists for an invasive treatment for the preservation or increase of alveolar bone, the base for denture prosthesis and non-invasive bone loss. Today, there is a growing interest in the development of non-invasive methods for bone regeneration.

Mechanical stimuli rely on the ability of the skeleton to adapt to changes in mechanical loading. Studies on the effects of mechanical loading have shown that mechanical stimuli can induce bone formation. However, the mechanisms by which these stimuli induce bone formation are not well understood. This study investigates the role of mechanical signals in modulating bone formation and the potential for bone regeneration.

Mechanical signals generated by muscle activity can induce bone formation. The results suggest that muscle activity can modulate the mechanical signals that induce bone formation, and that this modulation is mediated by high-frequency mechanical signals. The findings have implications for the design of bone augmentation procedures and the development of new therapies for bone loss.
Clinical Evidence

Is bone formation induced by high-frequency mechanical signals modulated by muscle activity?
JOURNAL OF MUSCULOSKELETAL AND NEURONAL INTERACTIONS

KEY CONCLUSIONS

• Bone can differentiate between various frequencies of vibration in terms of remodeling
• Subjects exposed to high frequency vibration (90hz) showed bone formation rates 159% greater than controls
• Bone formation rates in low frequency vibration subjects (45Hz) were not statistically different than controls
• The structural benefits that bone can gain through exposure to vibration are apparent
Clinical Evidence

Osteogenic Effect of High-frequency Acceleration on Alveolar Bone
Alikhani M, Khoo E, et al. (April, 2012) JOURNAL OF DENTAL RESEARCH

KEY CONCLUSIONS

• The experimental group had significant increases in bone quality over the same period of time compared to sham and control groups

• Increased bone remodeling activity resulted in thicker and denser bone trabeculae

• Localized high frequency force of low magnitude is able to induce osteogenic activity within the surrounding bone.

• High frequency acceleration (vibration) caused nearly twice as much bone remodeling as low frequency vibration (5 min/day application)
Vibratory stimulation increases interleukin-1 beta secretion during orthodontic tooth movement


KEY CONCLUSIONS

• 15 adult subjects underwent bi-lateral extraction of first premolar and canine distilization. Experimental canine was vibrated at 125Hz with an electric tooth brush

• Cumulatively, experimental teeth moved 61% more versus control teeth (over the 3 months T0-T3)

• After 2 months of vibration IL-1β jumped to approximately 3 times higher than levels observed in T1 or T2.

• In combination with orthodontic force, HFV stimulation appeared to increase bone resorption activity, accelerated tooth movement and greatly enhanced secretion of the inflammatory marker (IL-1β) in GCF.
Clinical Evidence

**Pain control in orthodontics using a micropulse vibration device: A randomized clinical trial**
Lobre W, Callegari B, et al. (online ahead of print; submitted Sep-2015)
THE ANGLE ORTHODONTIST

**KEY CONCLUSIONS**

- 30 participants were asked to rate chewing/biting pain and overall pain during 4 months of adjustments and wire changes.

- Patients in the experimental group used the vibration devices for 20 minutes daily.

- All participants using vibration reported that they were in less pain while using the device.

- The use of a vibration device significantly reduced the perception of overall and biting pain in patients undergoing orthodontic treatment versus controls.
Clinical Evidence

High-Frequency Acceleration: Therapeutic Tool to Preserve Bone following Tooth Extraction
Alikhani M, Lopez J, et al. (January, 2016) JOURNAL OF DENTAL RESEARCH

KEY CONCLUSIONS

High-Frequency (HFA) accelerates bone healing in the tooth extraction socket

Application of HFA in the long term preserves Alveolar bone

HFA increased bone healing through intramembranous ossification

“ Our study supports HFA as a simple treatment to promote alveolar bone formation. ”
Vibration Therapy in Orthodontics: Realizing the Benefits
Dr. Amit Lala (Pre-Print; AAO 2016)
Ortho: International Magazine of Orthodontology (DTI)

KEY CONCLUSIONS

Vibration therapy has many potential benefits including applications for aligner seating, relief of normal orthodontic pain, accelerated tooth movement, enhanced retention and applications for implant dentistry and prosthodontics.

A device operating in the high frequency range would likely be most effective in creating tooth movement as well as offering shorter wear times.

AcceleDent operates in the low frequency range explaining why recent study results have shown no significant impact on OTM. It requires a long, 20 minutes daily wear time impacting compliance.

HFV therapy could revolutionize the concept of orthodontic retention.

HFV therapy may be useful in implant dentistry and prosthodontic treatment.
High Frequency Vibration

• Definition
  • High Frequency Vibration - greater than 90Hz
  • Low Frequency Vibration - less than 45Hz

• Research Results
  • HFV shown to cause significantly more bone remodeling than controls
  • LFV shown to be much less effective or no better than controls

• VibraPro\textsuperscript{5} operates at 120Hz; AcceleDent operates at 30Hz
• VibraPro\textsuperscript{5}’s higher frequency is one key reason for shorter wear time
Clinical Evidence

Data From Aligner Seating Studies

• 100% of patients found the VibraPro\textsuperscript{5} device extremely easy to use
• 100% of patients have a preference in favor of VibraPro\textsuperscript{5} over other available aligner seating options
• With VibraPro\textsuperscript{5} patients had excellent seal and seating
• While using VibraPro\textsuperscript{5}, 100% of patients experienced little to no discomfort when switching to new tight fitting aligners
• Using VibraPro\textsuperscript{5} patients changed aligners every 5-7 days
The \textbf{VibraPro}^5 Device
VibraPro® Why the “5”?

★ 5-Minutes Daily Wear Time

• 5 Ultimate Benefits
  ① More Efficient Aligner Seating
  ② Relieves Orthodontic Pain
  ③ Accelerates Tooth Movement
  ④ Fast Tracks Retention
  ⑤ Stimulates Bone Growth and Remodeling
Product Overview

- The VibraPro\textsuperscript{5} is a device that uses high frequency vibration to seat clear plastic aligners.

- Full and complete aligner seating with VibraPro\textsuperscript{5} may lead to:
  - Enhanced comfort
  - Faster aligner treatments as properly seated aligners express their programming more efficiently.
The VibraPro\textsuperscript{5} Components

- VibraPro\textsuperscript{5} device
- VibraPro\textsuperscript{5} mouthpiece
- USB flash drive preloaded with Usage Summary Software
- Wall adapter
- Charging cable
# Product Comparison

<table>
<thead>
<tr>
<th>Overview</th>
<th>VibraPro</th>
<th>AcceleDent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Specifications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration Frequency</td>
<td>120Hz</td>
<td>30Hz</td>
</tr>
<tr>
<td>High / Low Frequency Vibration</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Patient Wear Time (min/day)</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Package Size</td>
<td>4.5 x 4 x 2.3</td>
<td>8 x 6 x 3</td>
</tr>
<tr>
<td>ROI / Value for Doctor</td>
<td>Excellent</td>
<td>None</td>
</tr>
<tr>
<td><strong>Clinical Findings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased Bone Formation</td>
<td>Significant</td>
<td>No</td>
</tr>
<tr>
<td>Accelerated Tooth Movement</td>
<td>Significant</td>
<td>No</td>
</tr>
<tr>
<td><strong>Potential Applications / Uses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accelerated Tooth movement</td>
<td>✓</td>
<td>+/-</td>
</tr>
<tr>
<td>Clear Aligner Seating</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Enhanced Retention</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Pain Relief</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Bone Growth / Density Modification</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Other Considerations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Targeted Application</td>
<td>Yes</td>
<td>No - Full Arch Only</td>
</tr>
</tbody>
</table>

- Current U.S. Indication for use
Directions For Use

- **Remove device** from packaging and **clean** the mouthpiece (rinse with water & dry).
- **Charge** the device fully prior to first use/first patient appointment.
- Assign the device to a specific patient ID **prior to first patient appointment**. Once assigned, device will be ready for use.
  - **To assign the device, use the VibraPro5 Usage Summary Software** provided on the USB flash drive received with device
- Connect the mouthpiece
- Press (apply firm pressure) the white on-switch. **The device will gently ramp up to full vibration.**
- 5 minutes per use and will automatically Shut-Off after Treatment
- Light blinks green to indicate cycle is complete
- After each time patient uses during treatment, clean and charge device.
## Device Status Notifications

<table>
<thead>
<tr>
<th>Status Light</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blue</strong> (Continuous Blinking)</td>
<td>5 minute cycle in progress</td>
</tr>
<tr>
<td><strong>Green</strong> (3 Blinks)</td>
<td>5 minute cycle completed</td>
</tr>
<tr>
<td><strong>Green</strong> (Continuous Light)</td>
<td>Device is fully charged</td>
</tr>
<tr>
<td><strong>Red</strong> (3 Blinks)</td>
<td>• Switch is pressed by user before treatment is complete</td>
</tr>
<tr>
<td></td>
<td>• When 5 minute treatment is interrupted and not completed within the 30 minute window</td>
</tr>
<tr>
<td></td>
<td>• When device is on/vibrating and user connects to USB (vibration device will stop)</td>
</tr>
<tr>
<td></td>
<td>• When 5 minute treatment is interrupted and user connects to USB within 30 minute time window</td>
</tr>
<tr>
<td><strong>Magenta</strong> (6 Blinks)</td>
<td>Device is at low battery level</td>
</tr>
<tr>
<td><strong>Amber</strong> (Continuous Light)</td>
<td>Device is plugged in to charger</td>
</tr>
</tbody>
</table>
Using the VibraPro\textsuperscript{5} Software

Assigning a Patient: Step by Step

• Please connect VibraPro\textsuperscript{5} to your computer via the blue wire provided with your device.
• Please insert USB into computer. When prompted, select the Apple or PC folder that corresponds to your computer. Save “VibraPro\textsuperscript{5}” file to your desktop (you will only do this one time) and open the software.
• Once Open, please select “Assign Device to a Patient.”
Using the VibraPro\textsuperscript{5} Software

Assigning a Patient: Step by Step

- Enter new patient details and customized patient ID of your choice and select “Add patient.”
Using the VibraPro\textsuperscript{5} Software

Assigning a Patient: Step by Step

- At this point, please select “Assign” to the right of the newly entered patient details. Device is now ready to record patient use.
- You will be able to obtain the usage summary when you next plug in the vibration device at subsequent patient visits.
Using the VibraPro\textsuperscript{5} Software

Accessing Usage Data

- To view patient usage data, please open the VibraPro5 software which should be saved to your desktop.
- Please select “Usage Summary From Device” to view data for patient currently using device.
  - If you would like to access data from stored users, please open software and select “Usage Summary From Stored Records” to access archived information.
Using the VibraPro\textsuperscript{5} Software

Usage Results Example
Propel@FullPower

Marketing Support
Marketing at Delivery of VPro5

Product Brochure
Case Gallery
Promotional Packages
Advertising
  • OrthoTribune AAO Preview Issue and Dailies
  • OPUS (May – Dec)
Articles
  • Device Reviews
  • Research Article – M. Alikhani
  • OPUS – Propelling Ortho (Sept / Oct)
Instructional Materials
  • Patient User Guide
  • Video Tutorials

In-Office Marketing
  • Product Video
  • Testimonials
  • POP (Desktop Stands, Demo Units, Posters)

Web / Social Media Kit
Initial Case

VibraPro®

Results

Propel@FullPower
Initial Results

• Aligner Intervals Decreased Dramatically By All Participants
  • Brigham - 5 days trays to 7 day trays
  • Shipley – started with 6 day trays; has now accelerated to 5 day changes
  • All others at 7 day changes

• Cases tracking very well

• Doctor and patients excited about results and finishing early
Quotes

"While using the VibraPro®, 100% of patients experienced little to no discomfort when switching to new tight fitting aligners"
Dr. Payam Ataii

“I love this device. It’s easy to use and doesn’t take a lot of my time. It took a few days to adjust to the vibrations, but now I am completely comfortable with using it. I am so excited and pleased that I can cut my treatment time so much and look forward to my new smile”.
VibroPro® Patient – Dr. Gary Brigham

“I am extremely pleased with both the results and patient response to Propel's vibration device. Aligner tracking is excellent, with patients exchanging aligners every 5, 6, or 7 days. My patients are delighted with the possibility of dramatically shortening their treatment time. This device is the perfect compliment to my use of MOPS, and further positions my practice at the cutting edge of accelerated orthodontics".
Dr. Gary Brigham
Questions?
# Vibration Objections and Answers

<table>
<thead>
<tr>
<th>Objection(s)</th>
<th>Answer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What clinical research do you have that your vibration works?</td>
<td>We have many research studies that show the benefits of high frequency vibration. Let me detail some of them with you.</td>
</tr>
<tr>
<td>Do you have cases?</td>
<td>While our initial cases are still in progress, the results so far have been terrific showing good tooth movement and aligners tracking at 5 to 7 day intervals.</td>
</tr>
<tr>
<td>Is the device FDA approved?</td>
<td>Yes, we are registered as a class 1 medical device.</td>
</tr>
<tr>
<td>Isn’t AcceleDent Patented? How are you not infringing?</td>
<td>Actually our vibration technology was developed at NYU and we have our own patents. Our device is different in many aspects and patent infringement is not a concern.</td>
</tr>
<tr>
<td>Does vibration really work? I’ve heard about several studies on AcceleDent showing lack of efficacy.</td>
<td>There’s plenty of research showing that vibration has multiple benefits to orthodontics. That research also shows that the frequency of vibration is very important to efficacy. Our device operates at an optimal frequency.</td>
</tr>
<tr>
<td>I have a lot of AcceleDent in stock and haven’t been able to sell them.</td>
<td>I’m sorry that you have had a bad experience with their device. What are your patients major objections to accepting treatment?</td>
</tr>
<tr>
<td>My patients complained about gagging and hated AcceleDENT’s mouthpiece so I stopped ordering them.</td>
<td>Our mouthpiece is completely different and thus far patients have had only positive experiences.</td>
</tr>
<tr>
<td>AcceleDent is the leader in vibration. What proof do you have that yours comparable?</td>
<td>AcceleDent was first to market, but research and doctor experience have shown mixed results at best. Our device operates at the optimal frequency that current research supports as being most efficacious.</td>
</tr>
<tr>
<td>I am a diamond level provider with AcceleDent and get patient referrals on a regular basis. I don’t want to give up my status or patient referrals.</td>
<td>How many referrals are you actually getting from their website. What would your case acceptance be if you told your patients they only had to wear the device 5 minutes per day and it was more affordable.</td>
</tr>
<tr>
<td>Propel has said MOPs is the better choice and vibration doesn’t work. Why are you now changing your position?</td>
<td>Propel still maintains that MOPs is the gold standard acceleration treatment. We haven’t changed our position but Propel’s vibration device operates on different principles.</td>
</tr>
<tr>
<td>Since you’re getting into vibration that must mean MOPs doesn’t work.</td>
<td>Propel still maintains that MOPs is the gold standard acceleration treatment. However we never said vibration doesn’t work - to the contrary we see HFV can have many benefits.</td>
</tr>
<tr>
<td>Vibration is too expensive and my patients won’t pay for it.</td>
<td>We agree that other vibration options have been too costly. Propel’s solution offer a great value to the patient and the opportunity for ROI for the doctor.</td>
</tr>
<tr>
<td>My patients won’t be compliant.</td>
<td>We understand that compliance has been an issue with other the vibration option’s 20 minute daily wear requirement. Our device, at 5-minute per day wear time is far more convenient.</td>
</tr>
<tr>
<td>Will the higher frequency be comfortable for the patient?</td>
<td>Our device ramps up over 30 seconds so the patient easily adjusts to the stimulation. Patients that have used the device note that although the vibration noticeable it is not uncomfortable.</td>
</tr>
<tr>
<td>Can the device really be effective in only five minutes per day?</td>
<td>Efficacy is about having the optimum frequency to remodel bone. Because we operate at a higher frequency we can be effective in 5 minutes per day.</td>
</tr>
<tr>
<td>AcceleDent has 12 mouthpieces. How can you fit every patient with only one?</td>
<td>It’s about delivering vibration to the occlusal surface and our universal mouthpiece makes full occlusal contact in the majority of patients. However we are evaluating whether additional configurations would be valuable.</td>
</tr>
<tr>
<td>Can we try one, if we buy/have bought Propel?</td>
<td>While we never offer free trial devices, as a good Propel customer we do have a special adoption program. With your next order of MOP devices we can offer a special price on a trial of six vibration units.</td>
</tr>
<tr>
<td>This device is too new and I’ll wait until others try it.</td>
<td>Doctor, your patients want this therapy and will seek it out. You want to be able offer this don’t you? Why don’t we start with a smaller order given your concern.</td>
</tr>
</tbody>
</table>
Cases in Progress

- Participating Doctors
  - Dr. Payam Ataii
  - Dr. Gary Brigham
  - Dr. David Boschken
  - Dr. Alla Dorfman
  - Dr. Thomas Shipley
  - Dr. Bella Shen
- Cases started in November through Jan
- In various early stages of progress towards finish