

## Vital-Dent: A Revitalizing Root Canal Solution

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Every day in the United States, 41,000 people will pay approximately \$1,100 each for root canal therapy treatment (RCT) of a diseased or injured tooth. The goal is to eliminate pain, infection and potential space for bacterial ingrowth. Unfortunately conventional RCT does not restore the tooth vitality necessary to prevent bacterial infiltration, to fight infection, and to sense injury. Aging of conventional RCT implant materials can lead to secondary caries. This leaves patients at an increased risk of tooth re-infection and fracture. About 30% of RCT will fail in a patient's lifetime, requiring more complicated and costly treatment, namely false tooth implants or pulling teeth. Revascularization is a promising regenerative RCT alternative, but is only clinically viable for children because results are inconsistent in adults. No therapeutic method or commercial product exists to revitalize RCT treated teeth in adults. Vital-Dent™ is the first commercialization-ready regenerative RCT for adults, and is designed for off-the-shelf (acellular) use in existing clinical workflows at any dental clinic.

### Technology Description

Vital-Dent™ is a revitalizing root canal implant for RCT treated teeth. It consists of a naturally-derived biomaterial and a chemotactic factor which promote migration of progenitor cells from the peri-apical space into the tooth, stimulate angiogenesis and neurogenesis into the tooth, and foster a pro-remodeling immune response to facilitate these. Vital-Dent™ is inserted into the canal space as are conventional RCT fillers. It will produce vital tissue in the tooth canal that guards against bacterial invasion and tooth injury by restoring sensation, intrapulpal pressure, and immune responsiveness. Compared to conventional RCT, Vital-Dent™ will reduce clinical time, procedure number, and total care cost. Vital-Dent™ is an attractive alternate for younger patients seeking to maintain their teeth, and for practitioners wishing to distinguish their practice.

### Advantages

- Regenerates vital root tissue, restoring protective tooth sensations and maintaining a healthy appearance
- Prevents bacterial invasion into the tooth chamber
- Provides consistent positive outcomes compared to current regenerative RCT
- Closer to commercialization than other regenerative RCT treatments

### Applications

- Human root canal treatments performed at family, corporate, and university-affiliated practices by general dentists and endodontists
- Veterinary root canal treatments



### Stage of Development

☐ = Completed, ☐ = In Progress

- ☐ Material development
- ☐ *In vitro* proof of concept
- ☐ Device prototype
- ☐ Pilot *in-vivo* test of prototype
- ☐ Prototype refinement
- ☐ *In-vivo* test (Implants on Sep '18 with outcomes on Feb '19)
- ☐ Competing for funding of a 10 animal preclinical study to start in '19
- ☐ Device design freeze and request for designation to FDA
- ☐ Preclinical GMP study

### IP Status

Provisional Application 62/645,364, March '18

### Notable Mentions

- Innovation Institute Pitt Ventures 1<sup>st</sup> Gear Program: \$3,000
- Semi-Finalist for 2017 Michael G. Wells Competition
- Finalist for 2018 Randall Family Big Idea Competition
- Innovation Institute Pitt Ventures 2<sup>nd</sup> Gear Program Interview Challenge