

Real-Time Jaw Drilling Monitoring Systems for Dental Implantation Surgery

Jaw drilling is an inexact and, often, blind art. During jaw drilling procedures, Dentists performing Dental Implantation Surgery (DIS) do not know the precise location of their drill tip in relation to nerves, blood vessels and other sensitive tissues along the drilling path and its surroundings. JetGuide's system complements pre-procedure imaging techniques (CT, panoramic x-ray and regular x-ray), thus advancing Dental DIS to a higher level with an *intra-operative* monitoring and guiding.

JetGuide's Dental proprietary is based on a unique ultrasonic technology, provides dentists with a simultaneous **feedback** on: (a) the distance between the bottom tip in the drilled bore and sensitive tissues, (b) the distance between the bottom tip and the pre-planned depth, (c) the depth of the drilled bore and (d) the drilling direction. The easy-to-use, the saved time and cost effective instrument takes the guesswork out of drilling, enabling dentists to drill into jaw without fear of harming these sensitive soft tissues. The result - greater surgeon and patient **confidence** in the successful outcome of the procedure.

JetGuide's Dental comprises of the following sub-units: a front-end, an electronic system and a display. The front-end consists of an ergonomic **disposable** handpiece. The system is *easy-to-use, affordable, short learning curve, accurate, compact, no harmful radiation and saves time.*

Thanks to differences in ultrasonic velocities of propagation between different tissues, it measures the distance between the bottom of the drilled bore in jaw and the closest layer of a sensitive tissue in its trabecular region of jaw's bone. This information, obtained from the reflected signals, is processed and displayed almost in real-time (less than 1 sec.) on a screen, placed within the surgeon's field of view

With this intra-operative jaw drilling monitoring and guiding system, **more dentists** will be able to perform DIS - enabling them to work *safer, more accurate and faster.* The first instrument of this kind was successfully clinically examined in more than 40 human DIS, in Rambam Health Care Center, during March-April 2008 [Eli E. Machtei, et. al., "Novel ultrasonic device to measure the distance from the bottom of the osteotom to various anatomical landmarks" Journal of Periodontology, July 2010]. Further clinical trial were performed successfully in more than 20 human trials, during 2013-14, using the Beta-Site miniature system

Market. The ISO Dental technical committee estimated in 2010 the global dental implant market at \$4.2 billion, increasing by 12% annually at least, where JetGuide systems will take over \$1.3 billion.

JetGuide's initial dental implant market is growing at a rapid pace. Patients are demanding implants as the preferred tooth replacement procedure. Dentists recognize this demand and its potential for increasing their revenue stream through dental implants. Most dentists perform implantation surgeries after attending a short course and in spite of that, the number of malpractices is incresed; **with JetGuide Dental, these procedures will be performed with confidence, more efficient and faster.**

Today, *every* dentist in Europe is allowed to perform implantation surgery.

JetGuide's potential, as seen through trends in the dental implant market is great.

Business model. JetGuide's market strategy: establish production expertise and generate rapid sales; The Company plans to enter the dental implant market through (a) dental supply distributors and (b) partnership with OEMs as dental devices and implants.

Success in marketing of dental products including its regulatory approvals will leverage its success all over the globe.

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■ KEY PERSONNEL

Jacob Halevy-Politch, D.Sc., E.E. Held senior positions at RAFAEL, Member of the research & academic staff of the Technion I.I.T., Officer in the Israeli Air-Force (IAF).

Professor Dan Adam, D.Sc. World recognized scientist in the field of ultrasonic applications in Biomedical systems. Member of the academic staff of the Technion I.I.T.

Andrei Craft, D.D.S. Over 25 years experience as oral and maxillofacial surgeon; specialist in dental implantology.

Nahum Rosenberg, M.D., MOrth. Senior orthopedic surgeon at the Rambam Health Care Center and Ass. Professor at the School of Medicine, Technion I.I.T., Haifa, Israel

■ COMPANY STATUS

Ownership: Founders, The Trendlines Israel Fund, Misgav Venture Accelerator & a Private Investor.

Achievements: 2006 – Prototype completed and tested *ex-vivo*.

2007 – Advanced prototype development

2008 – Successful *in vivo* human trials (>40) (Helsinki+IMH approvals)

2012/Q3 – Completed the Beta-Site systems system

2013/14 – Successful clinical human trials (>20) with the Beta-Site system.

■ REVENUE MODEL

Revenue will be realized from sales of JetGuide Dental systems and per procedure disposables.

■ INTELLECTUAL PROPERTY

Patents:

US#7748273 B2; Japan #4676503; EC #1836487, licensed also to Great Britain, France, Germany and Switzerland; Israel #166115 and a 2nd USPTO #8402829.

■ REGULATORY CLEARANCE

FDA notification 513(g): JetGuide Dental will be reviewed as 510(k) Class II.