

**GOCE DELCEV UNIVERSITY, STIP, NORTH MACEDONIA
FACULTY OF ELECTRICAL ENGINEERING**

ETIMA 2023

**SECOND INTERNATIONAL CONFERENCE
27-29 SEPTEMBER, 2023**



**TECHNICAL SCIENCES APPLIED IN ECONOMY,
EDUCATION AND INDUSTRY**



УНИВЕРЗИТЕТ
ГОЦЕ ДЕЛЧЕВ

ЕЛЕКТРОТЕХНИЧКИ
ФАКУЛТЕТ



ЕЛЕКТРОТЕХНИЧКИ ФАКУЛТЕТ,
УНИВЕРЗИТЕТ „ГОЦЕ ДЕЛЧЕВ”, ШТИП, СЕВЕРНА
МАКЕДОНИЈА

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GOCE DELCEV UNIVERSITY, STIP, NORTH MACEDONIA

ВТОРА МЕЃУНАРОДНА КОНФЕРЕНЦИЈА
SECOND INTERNATIONAL CONFERENCE

ЕТИМА / ETIMA 2023

ЗБОРНИК НА ТРУДОВИ
CONFERENCE PROCEEDINGS

27-29 септември 2023 | 27-29 September 2023

ISBN: 978-608-277-040-6

DOI: <https://www.doi.org/10.46763/ETIMA2321>



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Издавач / Publisher

Електротехнички факултет, Универзитет „Гоце Делчев“, Штип, Северна
Македонија
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Адреса: Крсте Мисирков, 10 А 2000, Штип/ Address: Krste Misirkov, 10A, 2000 Stip

E-mail: conf.etf@ugd.edu.mk

CIP - Каталогизација во публикација Национална и универзитетска библиотека
"Св. Климент Охридски", Скопје

62-049.8(062)

004-049.8(062)

МЕЃУНАРОДНА конференција ЕТИМА (2 ; 2023)

Зборник на трудови [Електронски извор] / Втора меѓународна конференција
ЕТИМА 2023, 27-29 септември 2023 = Conference proceedings / Second
international conference, 27-29 September 2023 ; главен и одговорен уредник
Сашо Гелев]. - Штип : Универзитет "Гоце Делчев", Електротехнички факултет ;
Stip : "Goce Delcev" University, Faculty of Electrical engineering, 2024

Начин на пристапување (URL): <https://www.doi.org/10.46763/ETIMA2321>. -

Текст во PDF формат, содржи 200 стр.илустр. - Наслов преземен од екранот. -

Опис на изворот на ден 25.03.2024. - Трудови на мак. и англ.

јазик. - Библиографија кон трудовите. - Содржи и: Appendix

ISBN 978-608-277-040-6

а) Електротехника -- Примена -- Собири б) Машинство -- Примена -- Собири

в) Автоматика -- Примена -- Собири г) Инфоматика -- Примена -- Собири

COBISS.MK-ID 63335173





Втора меѓународна конференција ЕТИМА
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Втора меѓународна конференција ЕТИМА Second International Conference ETIMA

PREFACE

The Faculty of Electrical Engineering at University Goce Delcev (UGD), has organized the Second International Conference *Electrical Engineering, Informatics, Machinery and Automation - Technical Sciences applied in Economy, Education and Industry-ETIMA*.

ETIMA has a goal to gather the scientists, professors, experts, and professionals from the field of technical sciences in one place as a forum for exchanging the ideas, strengthening the multidisciplinary research and cooperation, and promoting the achievements of technology and its impact on every aspect of living. We hope that this conference will continue to be a venue for presenting the latest research results and developments on the field of technology.

Conference ETIMA was held as online conference. More than sixty colleagues contributed to this event, from five different countries with more than thirty papers.

We would like to express our gratitude to all the colleagues, who contributed to the success of ETIMA'23 by presenting the results of their current research and by launching the new ideas through many fruitful discussions.

We invite you and your colleague to attend ETIMA Conference in the future as well. One should believe that next time we will have opportunity to meet each other and exchange ideas, scientific knowledge and useful information as well as to involve as much as possible the young researchers into this scientific event.

The Organizing Committee of the Conference

ПРЕДГОВОР

Меѓународната конференција *Електротехника, Технологија, Информатика, Машинство и Автоматика-технички науки во служба на економија, образование и индустрија-ЕТИМА* е организирана од страна на Електротехничкиот факултет при Универзитетот „Гоце Делчев“.

ЕТИМА има за цел да ги собере на едно место научниците, професорите, експертите и професионалците од полето на техничките науки и да претставува форум за размена на идеи, да го зајканува мултидисциплинарното истражување и соработка и да ги промовира технолошките достигнувања и нивното влијание врз секој аспект од живеењето. Се надеваме дека оваа конференција ќе продолжи да биде настан на кој ќе се презентираат најновите резултати од истражувањата и развојот на полето на технологијата.

Конференцијата ЕТИМА се одржа online и на неа дадоа свој придонес повеќе од шеесет автори од пет различни земји со повеќе од триесет труда.

Сакаме да ја искажеме нашата благодарност до сите колеги кои придонесоа за успехот на ЕТИМА'23 со презентирање на резултати од нивните тековни истражувања и со лансирање на нови идеи преку многу плодни дискусии.

Организационен одбор на конференцијата

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PHYSIODISPENSER – AND ITS USE IN DENTAL MEDICINE

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Abstract:

A physiodispenser is a specialized dental drill that is designed to prepare the implant site in the jawbone during the dental implant placement procedure. The use of a physiodispenser is important because it ensures that the implant site is properly prepared and the implant is placed with precision and accuracy. It cut bone very efficiently with controlled torch, speed and gear. There is constant saline irrigation system which washed away wash the bone debris and blood and also act as coolant. So after surgery patient will not get pain and swelling. It has very low noise, comfortable for patient. The physiodispenser is key technology in implant dentistry. The Physio-Dispenser is a device enabling us to embed the implants into the bone. Its main advantage is that, compared to standard dental sets of instruments, almost every part of the dispenser can be sterilized, which prevents spreading of infection into the operation wound. It allows bone surgery at low speed becomes extremely safe and patients will typically not get any swelling after surgery. It uses a combination of high-speed rotary motion and gentle oscillation to create precise, controlled channels in the bone for the dental implant to be placed. The oscillation feature helps to minimize damage to the surrounding bone tissue and increase the accuracy of the implant placement.

Key words:

comfort, control, drill, implant, physiodispenser

1. Introduction

A physiodispenser is indeed a medical device used in dentistry. It is designed specifically for drilling during dental procedures, allowing for precise and controlled movements.

A physiodispenser typically has adjustable speed settings to accommodate different drilling needs during dental procedures. The speed can be controlled by the dentist or technician operating the device.

Regarding the drill itself, it is usually a specially designed bur or bit that is used for drilling into the bone during dental implant placement. These drills are typically made of high-quality materials and come in various sizes to accommodate different implant sizes.

In this study we will show you some different types of physiodispensers and advantages and disadvantages of using the physiodispenser, also the specifics about it.

In dental implantology, a physiodispenser is commonly used to prepare the site where the dental implant will be placed. It allows for precise and controlled drilling into the bone, ensuring the implant is securely and accurately positioned. The use of a physiodispenser helps minimize trauma to the surrounding tissues and promotes faster healing.

2. Advantages

The surgical handpiece is like a superhero, swooping in to save the day, and its precision and power. It allows dentist to perform implant procedures with ease and accuracy, ensuring that those implants go in just right. One of the main benefits of surgical handpiece is versatility. It can be used of a variety of tasks during the implant procedure, from drilling the pilot hole to shaping the bone. It's like have the Swiss army knife in the dentist's hand.

Another advantage is the speed and the efficiency. It brings to the table. With the surgical handpiece, dentists can complete the procedures in a fraction of the time compared to the traditional manual methods.

2.1. Disadvantages

Like any superhero, the surgical handpiece has its kryptonite. One of the main concerns is the heat generated during the drilling process. This heat has potentially damaged the surrounding tissue if not managed properly. So dentists need to be mindful and take precautions to prevent any unwanted heat-related complications.

Another drawback is the noise. The sound of a dental handpiece can be a bit unnerving for some patients. It's like a dental symphony but not everyone is a fan of that particular tune, (14)

2.2. Types of physiodispensers

There are several types of physiodispensers used in dental implantology, each with its own features and advantages. Here are a few examples:

1. Surgical Handpiece: This is the most common type of physiodispenser. It is a handheld device that connects to the dental unit and is used to prepare the implant site by drilling into the bone.

2. Piezoelectric Handpiece: This type of physiodispenser uses ultrasonic vibrations to cut through the bone. It is particularly useful in delicate procedures where precision is crucial, as it minimizes trauma to the surrounding tissues.

3. Electric Handpiece: These physiodispensers are powered by an electric motor, allowing for more controlled and precise drilling. They often come with adjustable speed settings to accommodate different surgical needs.

4. Implant Motors: Implant motors are more advanced physiodispensers that offer a range of features. They typically provide torque control, speed adjustment, and preset drilling protocols. Some models even have integrated cooling systems to reduce heat generation during surgery.

The main difference between these physiodispensers lies in their power source and functionality. While all of them serve the purpose of drilling the implant site, their specific features cater to different clinical demands and preferences.

We've got electric ones, the air-driven ones, and even the ultrasonic ones. It's like a dental tool extravaganza. The electronic physiodispensers are the Energizer bunnies of the dental world. They keep going and going, providing the consistent and reliable power source for those implant procedures. No need to worry about running out of juice mid-operation. On the other hand we have the air-driven physiodispensers. These are like the dental equivalent of a turbocharged engine. They deliver high speed rotation, making implant procedures a breeze.

And let's not forget the ultrasonic physiodispensers. These futuristic tools use ultrasonic vibrations to create precise and controlled movements. It's like they're performing the dental symphony.

Now when it come for advantages for these physioidispensers it's all about efficiency and accuracy. The make the implant process faster and more precise, ensuring that your pearly whites are in good hands. With their different features, these physioidispensers allow dentist to customize their approach based on a patient's needs. It's like having a dental toolbox with all the right tools for the job, (3)

2.3. Specifics for some physioidispensers

1.The Surgic Pro2

Wireless pedal control

Bluetooth connectivity allows you to choose the optimal position without worrying about the length of the cable. The foot control is 400 g lighter than the previous model (including the hangar), which makes it easier to set up. You can focus on healing.

“Coolant Flow Volume Button”, “Program Button” and “Forward / Reverse Button” can be customized with 3 installed buttons that allow the operator to select the desired operation mode. In the energy-efficient power supply, 3 AAA batteries are used, which last about 6 months. A signal light shows when the batteries are running low.

Connectable to the ultrasound system "VarioSurg 3"

The Surgic Pro2 can easily be connected to the NSK Variosurg 3 ultrasound surgical system by adding our Bluetooth connection module. Using the NSK connection stand, two units can be safely stacked to save space.

One foot control

You can easily switch between Surgic Pro2 and VarioSurg 3 for improved flexibility and workflow.

Compatible with iPad

Installing a dedicated app and connecting an iPad to the control unit allows detailed procedural data to be displayed in real-time, such as rotational speed and torque range.

Process data can also be saved. Data can also be displayed and saved when connected to the Osseo 100+. Data management on the traceability of procedural details allows tailoring of implant treatment to individual patients.

Visibility is significantly improved by the high-resolution color LED

The use of a high-resolution color LED screen allows the blood and gums to be seen as if they were naturally lit, providing increased visibility during treatment. The LED light source generates a minimal amount of heat and has an excellent life expectancy.

2.Surgic pro'2

Technology and functions

- LCD touch screen
- Visibility is guaranteed by the large, high-contrast LCD screen with backlight.
- The screen can be adjusted in 10 brightness levels. Intuitive and easy-to-understand screen icons enable smooth operation.

Simple interface and clean screen

- Touchpad sensitivity can be adjusted to reliably respond when using surgical gloves and surgical barriers.
- Extremely narrow screen bezel makes cleaning easier.
- The new design takes into account the latest requirements for the treatment and control of cross-infections.

Quiet and smooth irrigation pump

The irrigation pump provides a consistent and constant flow that works quietly in the background. Setting up the irrigation tubing is quick and easy, and the pump fits seamlessly into the Surgic Pro2's compact and elegant design, (2)

3. Conclusion

When it comes to physiodispenser, these nifty gadgets play a crucial role in dental implant procedures. Think of them as the superheroes of the dental world, swooping in to save the day with the features and advantages. The use of a physiodispenser is important because it ensures that the implant site is properly prepared and the implant is placed with precision and accuracy. It cut bone very efficiently with controlled torch, speed and gear. There is constant saline irrigation system which washed away wash the bone debris and blood and also act as coolant. So after surgery patient will not get pain and swelling. It has very low noise, comfortable for patient. The physiodispenser is key technology in implant dentistry.

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