

MELAKA
INTERNATIONAL
INTELLECTUAL EXPOSITION

MIIEX '24

12 JUNE '24

Dewan Taming Sari,
Universiti Teknologi MARA Caw. Melaka,
Kampus Alor Gajah, Melaka

*"Empowerment of Special
Needs through Invention
& Innovation"*

**EXTENDED
ABSTRACT**

MiiEX'2024

MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024

**“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND
INNOVATION”**

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UiTM Cawangan Melaka

KM26 Jalan Lendu,

78000 Alor Gajah

Melaka Bandaraya Bersejarah

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MiiEX'2024

MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024

“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND
INNOVATION”

EDITORS AND COMPILERS:

Dr Maimunah Johari

Puan Norlinda Tendot Abu Bakar

Puan Maymunah Ismail

Puan Nor Halawah Ahmad

Cik Afzan Shahilla Amir Hamzah

Puan Azira Rahim

COVER DESIGN:

Rashidy Samsudin

Wan Nur Khalisah Shamsudin

Ridzuan Adli bin Azidin

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INNOVATION, INVENTION, AND DESIGN

FOREWORD BY THE RECTOR OF UiTM CAWANGAN MELAKA



Professor Ts. Dr. Mohd Rasdi bin Zaidi

Rector, Universiti Teknologi MARA (UiTM)

Cawangan Melaka

Welcome to the Melaka International Intellectual Exposition 2024 (MIIEX '24). It is an honour for me, on behalf of UiTM Cawangan Melaka, to thank all of you for joining MIIEX '24. We are proud to inform you that this is the 13th consecutive year that UiTM Cawangan Melaka is organizing this exposition. Since 2009, UiTM Cawangan Melaka has successfully hosted this innovation exposition. Not only have we succeeded in organizing the exposition, but we have also successfully embarked on commercialized products.

2024 is a special year where MIIEX 2024 emphasizes the development of special needs. As we know, special needs indicate a limitation in a person's ability to engage in and benefit from various aspects, such as daily activities and education. Hence, with the theme "Empowering Special Needs Through Invention and Innovation," it is a platform for industries, professionals, academicians, students, and communities to share their innovative ideas and products to increase accessibility for those with special needs.

The successful implementation of MIIEX '24 is our joint success. This event was supported by the Melaka state government through YB Datuk Fairul Nizam bin Roslan, the EXCO of Science, Technology, Innovation, and Digital Communication. I also want to express my

gratitude to Universitas Negeri Padang, Indonesia, Universitas Muhammadiyah, Makassar, Indonesia, the International Association of Economic and Businesses (IAEB), Universiti Sains Islam Malaysia, Ibnu Umami Maktum Research Center (UMMI), USIM, and The Southeast Asia Minister of Education Organization Regional Centre for Special Educational Needs (SEAMEO SEN) as our co-collaborators for MIIEX 2024.

The collaboration from various parties in MIIEX '24 is a platform that will improve cooperation and interweaving among industries, professionals, academicians, students, and communities in shaping their potential in developing innovation products. This exposition also serves as a platform to cultivate and uphold the nation's innovation culture by presenting new ideas and research by young people, especially from academia and universities. Indirectly, MIIEX '24 will encourage all inventors towards empowering Science, Technology, Engineering, and Mathematics (STEM), especially in primary and secondary schools.

The new digital landscape also inspires more innovation and new ideas that contribute to various activities, such as business and industries. As a university that encourages "Research and Innovation," we aim to foster more innovative products that benefit scholars, industries, and communities, addressing issues to improve our present and future life.

This exposition would never happen without dedication, teamwork, and commitment. A round of applause should be given to the committee teams, who are the backbone of this exposition. Their hard work, effort, and time made this exposition possible.

Finally, I would like to conclude this brief remark by thanking all the participants and stakeholders for joining the exposition. We hope that this collaboration never ends here.

Thank you.

FOREWORD BY THE DEPUTY RECTOR (RESEARCH & INDUSTRIAL LINKAGES)



Associate Professor. Dr. Nur Hayati binti Abd Rahman

Deputy Rector (Research & Industrial Linkages), Universiti Teknologi MARA (UiTM) Cawangan Melaka

With much passion and privilege, let me warmly welcome all of you to the Melaka International Innovation Exhibition (MIIEEX), UiTM Cawangan Melaka's flagship event. I firmly believe that events such as these demonstrate the gradual evolution of this platform in terms of its significance and its governing principles within the sphere of learning and the broader scholarly society.

The theme for this year, "Empowering Special Needs Through Invention and Innovation," strongly connects to our mission of using research and technology to make a positive impact on the world we live in. Besides enforcing the message of diversity, this theme also reaffirms our focus on creating products to improve the lives of people with disabilities (PWDs). Such innovations are vital as only through focused constructive changes can society become more sensitive to the needs of all members.

MIIEEX allows researchers, students, and industry professionals to come together, share their innovative research, and develop viable research partnerships. It has been great to see the enthusiasm of the participants and the efforts they put into their projects, which can offer various social and economic benefits. This is why one can state that MIIEEX is a great

opportunity for creating connections between the academic environment and industry, facilitating the implementation of innovative and promising projects.

Finally, I would like to express my sincere appreciation to all the members and supporters of the organizing committee, all the participants, sponsors, and everyone involved in preparing this event. I want to express my gratitude for your commitment and involvement, as the success of MIIEX and the development of an active culture of innovation in our university and beyond is partly owed to your support.

Thank you

FOREWORD BY THE PROJECT DIRECTOR



Dr Zulkefli bin Muhamad Hanapiyah

Senior Lecturer

Assalamualaikum and Warmest Greetings,

It gives me a great pleasure, on behalf of the organizing committee, to welcome all participants and speakers to the Melaka International Intellectual Exposition 2024 (MIIEX '24) with the theme "Empowering Special Needs Through Invention and Innovation." We are honoured and pleased to welcome all participants to this biennial event.

MIIEX '24 is a platform that gathers experts from local and international industries, academia, scientists, researchers, and the community to contribute to the advancement of scientific and technological knowledge. This knowledge helps develop disruptive innovation products that improve daily activities for businesses and the community, especially those with special needs.

MIIEX '24 provides an atmosphere for inventors of all levels to gain new exposure and collaborate. Indirectly, this promotes a collaborative and innovative culture that focuses on cutting-edge technologies and new standards in technology and creativity.

MIIEX '24 is anticipated to serve as an arena for participants to acquire and disseminate revolutionary information on ideas and innovation. It is intended that the competition will expose the contestants' minds to the latest technologies and designs, aligning with the government's goal of encouraging innovation in Malaysia.

Finally, I want to compliment my fellow committee members on their amazing efforts, which were vital to the event's success. In addition, I want to thank our co-organizers, event sponsors, and participants. Optimistically, we hope that all new knowledge discovered, invented, or innovated will lead us toward future sustainability.

Thank you.

**FOREWORD BY MELAKA STATE EXCO OF SCIENCE, TECHNOLOGY,
INNOVATION AND DIGITAL COMMUNICATIONS**



YB Datuk Fairul Nizam bin Roslan

Melaka State Exco of Science, Technology, Innovation and Digital Communications

Welcome to the Melaka International Intellectual Exposition 2024 (MIIEX '24). It is an honor for me, on behalf of UiTM Cawangan Melaka, to thank all of you for joining MIIEX '24. We are proud to inform you that this is the 13th consecutive year that UiTM Cawangan Melaka is organizing this exposition. Since 2009, UiTM Cawangan Melaka has successfully hosted this innovation exposition. Not only have we succeeded in organizing the exposition, but we have also successfully embarked on commercialized products.

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Finally, I would like to conclude this brief remark by thanking all the participants and stakeholders for joining the exposition. We hope that this collaboration never ends here.

Thank you.

MIIEX'24 ORGANISING COMMITTEE

COMMITTEE	NAME
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	TUAN MUHAMMAD IDRIS IRFAN BIN TUAN MOHD AZAHAR
	RASEEDA BINTI HAMZAH
	TS. DR. NOR AFIRDAUS BINTI ZAINAL ABIDIN
DESIGN & MULTIMEDIA	EN RASHIDY SAMSUDIN
	RIDZUAN ADLI BIN AZIDIN
	WAN NUR KHALISAH SHAMSUDIN
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	BUSHRA ABDUL HALIM
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	SITI NAZIRAH BINTI OMAR
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	FAIQAH HAFIDZAH BINTI HALIM
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	PN MAYMUNAH ISMAIL
	PN NOR HALAWAH AHMAD
	PN AZIRA RAHIM
	NORLINDA TENDOT ABU BAKAR
	AFZAN SHAHILLA AMIR HAMZAH
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	ENCIK KHAIRI BIN KHAIRUDDIN
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	MOHD SUFIAN AB KADIR
	SITI MARIAM ALI
	ERRATUL SHELA ESHAK
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	MASLIZA BINTI MOHD RAZALI
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	AFZAN SAHILLA BINTI MOHD AMIR HAMZAH
	MUHAMMAD FURQAN BIN AZHAR
	KHAIRUL AZHAR BIN LOCHMAN

ABOUT MIIEX'24

MIIEX'24 is an innovation competition annually organised by UiTM Melaka with the intention to bring together ideas and inspiration that could fit in for commercialization needs.

This event creates a platform for researchers to establish networking, partnership and opportunities to collaborate with industries.

OBJECTIVES

1. Encourage and instil passion towards inventing and innovating among UiTM Cawangan Melaka staff, students and academicians of local and international higher education institutions;
2. Highlight distinguished talents of skilful inventors and exhibit intellectual products, inventions and innovations among local and private tertiary institutions, government and private agencies, including international participants;
3. Become an effective Business Matching platform for participating research products, matching industries and partnering government agencies;
4. Recognise, inspire and promote invention and innovation products to be patented and commercialized;
5. Increase passion towards inventing and innovating through research and boost interests of government and non-government agencies to obtain consultancy services from a line up experts of higher education institutions and UiTM Cawangan Melaka.

THEME

'EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND INNOVATION'

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“Socket Lock-it”: Tooth Extraction Socket Compression Device for Special Needs Patients

Aminda Faizura Omar ¹, Ahmad Syukri Rosli ¹, Mohd Isyrafuddin Ismail ¹, Tun Yasmin Iffah Mohd Suria Affandi ¹, Nur Nabilah Husna ¹, Mas Suryalis Ahmad ¹

¹ Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Selangor Campus, Malaysia.

aminda@uitm.edu.my

Abstract

Mechanical pressure is important for bleeding control after tooth extractions as it not only augments the coagulation cascade by constricting blood vessel and stimulating platelet plug formation to occlude blood vessels. This is not always possible in individuals with special needs (IWSN), patients who have no opposing teeth or unable to tolerate suturing. This increases the risk for reactionary or prolonged bleeding. The objective of the “Socket Lock-it” is to compress dental extraction sockets by locking the gauze or pressure packs in place to assure the initiation phase of hemostasis is achieved in the early post-extraction period. Utilising non-plastic materials to be more environmentally friendly, this device has two layers of materials: a soft polyurethane inner layer (1.0mm) for soft tissue protection and hard protective co-polyester outer layer to prevent fracture or breakage in the event the patient bites down. This device provides continuous pressure to extraction sites without the need for compliance. Due to the variation in alveolar ridge sizes, this device is malleable when submerged in hot water and can be well adapted to any size of edentulous ridge. It also comes in various shapes according to the extraction site. A metal dot has been impregnated into the edge of the device to easily detect the device in the event of ingestion or aspiration. Another fail-safe method to prevent aspiration is the addition of a hole at edge of the device to help anchor the device extraorally using floss. This easy-to-use device can be used in by any clinician in both adult and paediatric patients therefore can be commercialised to general dentists and specialists to prevent adverse effects of uncontrolled bleeding. The extended

buccal flap not only provide additional retention and but a clear indicator of the direction of the device which can help clinicians effectively use it.

Keywords: bleeding control, pressure, special needs, tooth extraction

1. INTRODUCTION

Bleeding control or hemostasis from dental extractions is required after severing periodontal blood vessels. This process in the sockets begins with the constriction of blood vessels and a platelet plug formation that occludes the broken vessel (Yerragudi et al., 2023). In dentistry, the initial phase of hemostasis is usually achieved by instructing patients to bite on gauze after for at least 10 minutes after the procedure. The pressure mechanically augments the coagulation cascade to halt post extraction bleeding while preventing reactionary or secondary bleeding (Kumbargere Nagraj et al., 2018). In cases of extractions for individuals with special needs (IWSN), this may not be easily achieved and poses issues with prolonged bleeding or wound dehiscence is not well managed in the initial phase.

2. OBJECTIVE

The “Socket Lock-it” device aims to compress dental extraction sockets by locking the gauze or pressure packs in place to assure the initiation phase of hemostasis is achieved in the early post-extraction period.

3. NOVELTY & INVENTIVENESS

As we know, there has yet to be a hemostasis method using a device to introduce initial pressure without surgical intervention. Utilising non-plastic materials to be more environmentally friendly, this device has two layers of materials: a soft polyurethane inner layer (1.0mm) for soft tissue protection and hard protective co-polyester outer layer to prevent fracture or breakage in the event the patient bites down, this device provides continuous pressure to extraction sites without the need for compliance. Despite the short period of intended use, the

soft inner layer prevents for excess trauma on the tissue which could further promote bleeding and impair healing. To make this device more diverse, the hard protective layer comes in a variety of thickness so it can be adapted to both adults and children with special needs. This device comes in 6 different shapes according to the different extraction sites: anterior upper and lower, posterior left upper and lower and posterior right upper and lower. Due to the variation in alveolar ridge sizes, this device is malleable when submerged in hot water and can be well adapted to any size of edentulous ridge. A metal dot has been impregnated into the edge of the device to easily detect the device in the event of ingestion or aspiration. Another fail-safe method to prevent aspiration is the addition of a hole at edge of the device to help anchor the device extraorally using floss.

4. PRACTICALITY & USEFULNESS

This device is easy to use by any clinician as the extended flange is a clear indicator of the buccal side the device. The extension will also allow for better retention of the device reducing the technical skill requirement to use the device. With the presence of designated designs according to the extraction site, this allows for better adherence and faster adaptation to specific extraction regions. In cases where some modifications maybe be needed to the device, it can easily be trimmed or reshaped using standard denture trimming or polishing burs which every dental clinic is equipped with. Taking into consideration the risk and inability for suturing especially in patients with behaviour issues, this device provides direct pressure to the extraction site even if patients refuse to bite or are unable to. It can also benefit geriatric patients lacking opposing teeth which cannot effectively bite down after extractions as well as to better provide contact of tranexamic acid on gauze for patients using anticoagulant to prevent prolonged bleeding.

5. CONCLUSION

Using this simple and easy-to-use device in any practice can reduce the risk of prolonged or reactionary bleeding in patients unable to bite on gauze due to cognitive issues, behaviour issues or a lack of opposing teeth like in the elderly. It can also be beneficial in patients with bleeding risk to stabilise the initial clot within the socket preventing adverse effects in situations where suturing is not possible. With the use of a co-polyester shell with a soft polyurethane inner layer, this device is sustainably made with non-plastic material making it environmentally friendly. The 'Socket Lock-it' should be an addition in any dental practice to assure all patients can safely be discharged without the risk of bleeding.

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