Official Title:

# Volumetric Analysis of Peri-Implant Soft Tissue Changes Between Polyethereketone (PEEK) Anatomic Healing Abutments and Standard Healing Abutments in Posterior Single Implant Restoration : A Prospective Randomized Clinical Trial

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Pending

Protocol ID / Protocol Number:

Study IIS 26/25

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Sponsor:

Faculty of Dentistry, Universiti Teknologi MARA Selangor

Principal Investigator:

Dr Nur Hafizah Kamar Affendi

*CLINICAL TRIAL PROTOCOL*

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| Study Product | Anatomic Healing Abutment |
| Manufacturer | Institut Straumann AG |
| Sponsor: | Faculty of Dentistry, Universiti Teknologi MARA Selangor |
| Protocol author | Dr Nur Hafizah Kamar Affendi<br>Consultant Prosthodontist<br>Centre of Studies for Restorative Dentistry (Prosthodontics)<br>Faculty of Dentistry Universiti Teknologi MARA Selangor<br>Signature:  |
| Reviewed and approved by | Professor Dr. Mohd Yusmiaidil Putera Mohd Yusof<br>Consultant Forensic Odontologist & Dentomaxillofacial Imaging<br>Center for Oral & Maxillofacial Diagnostics & Medicine Studies<br>Faculty of Dentistry<br>Universiti Teknologi MARA<br>Sungai Buloh Campus, Selangor<br>Signature:<br>  |

This Protocol Incorporates the Following Ammendments

| Document | Date of Issue |
|---|---|
| Protocol Version 1.0 | 08 Oct 2025 |

## Confidential Statement

*The information in this document is confidential and is proprietary to sponsor-investigator initiates studies. It is understood that information in this document shall not be disclosed to any third party, in any form, without prior written consent of an authorised officer*

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Synopsis

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| Study Title | Volumetric Analysis of Peri-implant soft tissue changes between Polyetheretherketone (PEEK) Anatomic Healing Abutments and Standard Healing Abutment In Posterior Single Implant Restoration : A Prospective Randomized Clinical Trial |
| Protocol Number | Study IIS 26/25 |
| Study Registration | This Protocol will be registered at https://register.clinicaltrials.gov/prs/beta/records |
| Objectives | This prospective randomized clinical trial will evaluate the clinical outcomes of the implant crown fabricated with standard scan body (control) and polyetheretherketone (PEEK) anatomic healing abutment (test).<br><br>Primary objectives:<br>To compare volumetric soft-tissue changes at healed sites before implant placement and after implant crown loading when using a standard healing abutment versus a polyetheretherketone anatomic healing abutment<br><br>Secondary objectives:<br><br>To evaluate the immediate and time-dependent peri-implant soft-tissue dimensional changes following removal of the standard healing abutment compared with the polyetheretherketone anatomic healing abutment.<br><br>To compare Pink and White Esthetic Score (PES/WES), keratinized mucosal width, and mesiodistal papilla height between implant crowns conditioned with a standard healing abutment versus a polyetheretherketone anatomic healing abutment. |

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| | To determine whether the polyetheretherketone anatomic healing abutment improves time efficiency and crown-fitting accuracy in the prosthetic workflow compared with the standard scan body.<br><br>To compare Oral Health Impact Profile (OHIP) scores and patient-reported outcome measures (PROMs) between digital impressions taken with a standard scan body and polyetheretherketone anatomic healing abutment**.** |
| Study Design | A Prospective Open label double arm Randomized controlled Clinical Trial |
| Study Product | Anatomic Healing abutment |
| Study Duration | 24 months |
| Study Centre | Universiti Teknologi MARA, Artius Dental Specialist Centre, Alfonso Dental Laboratory |
| Number of Subjects | 38 (19 control, 19 test) |
| Study Population | The study population involved healthy participants aged 18 above, requiring a single first molar implant with sufficient prosthetic space (≥5 mm), mesiodistal distance ≥8 mm, and buccolingual ridge width ≥6 mm who meets the inclusion and exclusion criteria |
| Inclusion criteria | • legally competent to provide written informed consent form prior to any study related procedures.<br>• Subjects of either sex and aged 18 above<br>• requires replacement of a single missing posterior tooth with adequate mesiodistal dimension (≥8 mm)<br>• intact adjacent teeth on both sides with existing opposing tooth condition<br>• good oral hygiene, plaque score <25% bpe1<br>• adequate keratinized mucosa width (kmw) minimum 6 mm at the edentulous site |

<table>
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<ul>
<li>adequate bone volume to accommodate the planned dental implant placement of 5.5 mm diameter and 10 mm in length as verified by Cone Beam Computed Tomography (CBCT)</li>
<li>adequate interoccusal distance (crown height space) of at least 6mm measured from alveolar crest to the occlusal table.</li>
</ul>
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<tr><td>Exclusion criteria</td><td>
<ul>
<li>Localized or generalized periodontitis</li>
<li>Presence of active acute infection</li>
<li>History of malignancy, radiotherapy or chemotherapy</li>
<li>Bone metabolic diseases (e.g.: osteogenesis imperfecta, Paget’s disease) or current use of medications affecting bone metabolism</li>
<li>Untreated bruxism or parafunctional habits</li>
<li>Severe occlusal discrepancy</li>
<li>Any medical condition contraindicating implant placement or alter daily activities to a level consistent with ASA (American Society of Anesthesiologist) III classification (including cardiovascular, hepatic, renal, gastrointestinal, metabolic, neurologic, pulmonary, endocrine, autoimmune or psychiatric disorders)</li>
<li>Subjects in need of bone grafting at the site of intended implantation site.</li>
<li>Subjects that are pregnant</li>
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<tr><td>Treatment plan</td><td>Screening of eligible patient will take place within 12 weeks from the start of the trial. All eligible subjects will receive full mouth scaling and prophylaxis, will go through CBCT investigation, and will attend for 6 visits (from 12 months follow up) for clinical treatment and evaluations.
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<tr><td>Visit</td><td>Treatment details</td><td>Schedule</td></tr>
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| | Visit 1 | Informed consent, IOS Scan (T0), intraoral photo, | Within 30 days of enrollment |
| | Visit 2 | Implant placement, ISQ Value, X-ray, Photo, | 3 weeks after visit 1 |
| | Visit 3 | Postoperative follow up | 2 weeks after visit 2 |
| | Visit 4 | IOS scan SHASSB, AHA (T1), TIME,OHIP, PROMS | 8 weeks after visit 2 |
| | Visit 5 | IOS scan (T2i, T2d), Delivery of implant crown, PESWES, | 4 weeks after visit 4 |
| | Visit 6 | 12 months recall visit, PESWES, IOS (T3) OHIP, PROMS | 12 months after visit 5 |
| Investigational device | Anatomic Healing abutment | | |
| Registration Status | MDA Clearance | | |
| Primary analysis | The primary analysis of volumetric soft tissue changes will be performed after all subjects complete the 12 months follow up | | |
| Primary endpoint | • Three-dimensional volumetric analysis changes at healed sites before implant placement and after implant crown loading | | |
| Secondary Endpoint | • KMW height variation (KMHv), Mesial papilla height variation(MPHv) and distal papilla height variation(DSHv) | | |

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| | • Three-dimensional volumetric analysis changes of immediate and time-dependent peri-implant soft-tissue dimensional changes<br>• Pink Esthetic White Esthetic Score<br>• Implant fit, OHIP, PROMS |
| Statistical Consideration | Statistics of the endpoints will be collected by single principal investigator and will be outlined in the statistical method |
| Safety | The subjects will be monitored for adverse events by the Investigator untuil the end of follow up for each subjects. Any adverse events or complication will be reported to Straumann |
| Countries in which the study will be performed | Malaysia |
| Number of participating Centres | 2 centers |
| Principal Investigators at Centers | Dr Nur Hafizah Kamar Affendi, DDS |
| Date of Study Initiation | March 2026 |
| Date of Study Completion | Enrolment through June 2026, Follow up complete for all subject by March 2028 |
| Compliance | The ethical and scientific principles governing clinical research as set out in the Declaration of Helsinki, the principles of ICH GCP, ISO 14155:2011 and applicable medical device regulations/ guidelines. |

Contact Information

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ABBREVIATIONS

| | |
|---|---|
| ADE | Adverse Device Effect |
| AE | Adverse Event |
| ASA | American Society of Anesthesiologists |
| ASADE | Anticipated Serious Adverse Device Effect |
| CADCAM | Computer-Aided Design and Computer-Aided Manufacturing |
| CBCT | Cone Beam Computed Tomography |
| CDM | Clinical Data Management |
| CG | Control Group |
| CI | Confidence Interval |
| CRA | Clinical Research Associate |
| CRF | Case Report Form |
| CRO | Contract Research Organization |
| ED | Essential Document |
| FDI | Fédération Dentaire Internationale |
| GCP | Good Clinical Practice |

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|---|---|
| HIV | Human Immunodeficiency Virus |
| ICD | Informed Consent Document |
| ICH | International Conference on Harmonization |
| IEC | Independent Ethics Committee |
| IFU | Instructions for Use |
| IG | Investigational Group |
| IRB | Institutional Review Board |
| ISO | International Organization for Standardization |
| ISQ | Implant Stability Quotient |
| ISF | Investigator Study File |
| ITT | Intention-To-Treat |
| OHIP-M | Oral Health Impact Profile (Malaysia) |
| PI | Principal Investigator |
| PIS | Patient Information Sheet |
| PROMS | Patient Reported Outcome Measure |
| RFA | Resonance Frequency Analysis |
| SADE | Serious Adverse Device Effect |
| SAE | Serious Adverse Event |
| SOP | Standard Operating Procedure |
| UiTM | Universiti Teknologi MARA |
| USADE | Unanticipated Serious Adverse Device Effect |

**Background and rationale**

In recent decades, implant supported restorations have evolved into a well-established therapeutic option for restoring a single missing tooth(1). One of the key factors contributing to their success is the presence of a well-contoured prosthesis that closely mimics the morphology of adjacent teeth. In addition, the restoration must support the health of hard and soft tissues surrounding the peri-implant mucosa. To replicate the peri-implant soft-tissue contour, the conventional workflow employs an analog impression protocol, which may prone to deformation caused by dimensional changes in impression materials or dental stone.(2) This process also requires longer chairside time and may cause patient discomfort. Considering these limitations, digital impressions obtained using intraoral scanners have been introduced to address these challenges (3)

With advances in computer-aided design and manufacturing (CAD/CAM), the workflow to fabricate implant restorations is commonly carried out using scan body. Once the implant has osseointegrated, the routine clinical protocol involves disconnection of the titanium standard healing abutment,followed by scanning the scan body , peri-implant mucosa contour, the antagonist arch, and occlusal registration. This workflow, however, requires repeated component disconnections, which may lead to peri-implant mucosal collapse and inaccuracies in soft tissue profile replication.(4) Furthermore, the use of standard healing abutment size often creates a circular soft tissue contour, resulting in an unfavourable emergence profile that may require additional surgery or recontouring. Therefore, reproducing the anatomy of the contralateral tooth with a well-contoured implant restorative emergence profile (IREP) is commonly recommended through the use of a custom healing abutment. (5)

Several methods have been introduced to fabricate customized healing abutments, including the chairside addition of flowable composite to temporary abutments.(6) In addition, the computer-aided design and computer-aided manufacturing (CAD/CAM) socket seal abutment (SSA) has been proposed to preserve soft and hard-tissue dimensions following implant placement.(7) This workflow includes an additional step of milling the SSA and cementing it to a temporary abutment during the same surgical appointment. However, this approach carries a risk of contamination and requires additional time and cost. (8) Despite these developments, challenges remain with the current use of standard scan bodies. Most standard

scan bodies have a conical or cylindrical shape that fails to replicate the natural morphology of a tooth, especially in posterior molar regions. Furthermore, regardless of the patient's gingival phenotype, peri-implant mucosal collapse occurs rapidly often within 20 seconds after losing the physical support following the removal of the customized healing abutment and insertion of the scan body.(9) This soft tissue deviation may cause unstable mucosal margin and exert excessive pressure when delivering final implant restoration, often leading to additional chairside adjustments.

To overcome the peri-implant soft tissue deviation and accurate replication, a novel anatomic healing abutment fabricated from polyetheretherketone (PEEK) has been introduced to capture digital impression without removing the healing abutment. This allows one-step formation of an emergence profile that mimics natural tooth anatomy and may reduce the chairside time. Utilizing a predefined emergence profile in the software library, the AHA eliminates the need for additional soft tissue modification, expedites the prosthetic workflow, and includes an identification code for accurate scanning. Despite these advantages, there is currently no clinical evidence validating the use of AHA for preserving peri-implant soft tissue, improving workflow efficiency, crown-fitting accuracy, or evaluating its impact on patient-related outcomes. This warrants further investigation through controlled clinical evaluation. Therefore, this study aims to evaluate the dimensional changes of peri-implant soft tissue following implant placement in healed sites before and after crown delivery, to assess the immediate and time-dependent soft-tissue stability after standard healing abutment and AHA removal. Additionally, this study will compare the pink white esthetic score (PESWES) , keratinized mucosa width (KMW) , mesiodistal papilla height variation and patient-related outcomes of digital impression workflows using either a standard scan body or AHA for posterior single-implant restorations.

**References to background**

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## 2.0 Research Objective

This study aims to evaluate soft-tissue volumetric changes, peri-implant emergence profile dimensional changes, prosthetic workflow time efficiency, crown-fitting accuracy, Oral Health Impact Profile (OHIP), and patient-reported outcomes for posterior single-implant restorations fabricated using a standard scan body in comparison with polyetheretherketone anatomic healing abutment within a complete digital workflow.

### 2.1 Primary Objectives

1. To compare volumetric soft-tissue changes at healed sites before implant placement and after implant crown loading when using a standard healing abutment versus a polyetheretherketone anatomic healing abutment.

### 2.2 Secondary Objectives

2. To evaluate the immediate and time-dependent peri-implant soft-tissue dimensional changes following removal of the standard healing abutment compared with the polyetheretherketone anatomic healing abutment.
3. To compare Pink and White Esthetic Score (PES/WES), keratinized mucosal width, and mesiodistal papilla height between implant crowns conditioned with a standard healing abutment versus a polyetheretherketone anatomic healing abutment.
4. To determine whether the polyetheretherketone anatomic healing abutment improves time efficiency and crown-fitting accuracy in the prosthetic workflow compared with the standard scan body.

5. To compare Oral Health Impact Profile (OHIP) scores and patient-reported outcome measures (PROMs) between digital impressions taken with a standard scan body and polyetheretherketone anatomic healing abutment**.**

**3.0 Statement on Ethical Issue**

This study will be conducted with the highest respect for the individual participants in accordance with the requirements of this clinical study protocol and in accordance with the following:

• The ethical principles that have their origin in the Declaration of Helsinki.

• International Conference on Harmonisation (ICH) E6 Good Clinical Practice: Consolidated Guideline.

• ISO 14155:2011 (2nd Edition) Clinical Investigation of Medical Devices for Human ubjects – Good Clinical Practice.

• All applicable laws and regulations, including, without limitation, data privacy laws, clinical trial disclosure laws, and regulations.

3.1 Independent Ethics Committee

The Ethics Committee involved in the clinical trial will review the protocol and any amendments and advertisements used for recruitment. The IEC will review the patient information sheet and the informed consent document, their updates (if and any written materials given to the patients. A list of all IECs to which the protocol has been submitted and the name of the committee chairmen will be included in the clinicat trial report

3.2 Regulatory Authority Authorisation/Approval/Notification

All ethical and regulatory approvals must be available before a patient is exposed to any trial-related procedure, including screening tests for eligibility.

### 3.3 End-of-Trial and End-of-Trial Notification

End-of-Trial is defined as the date the last patient performs the last visit in the trial. At the end of the trial, the regulatory authorities and IECs will be notified about the trial completion according to the institutional requirements.

### 3.4 Ethical Conduct of the trial

This trial will be conducted in accordance with the ethical principles that have their origins in the Declaration of Helsinki, in compliance with the approved protocol, GCP, and applicable regulatory requirements.

### 3.5 Patient Information and Informed Consent

An English master version of the Patient Information Sheet (PIS) and Informed Consent (ICD) will be provided for translation and adaptation into local languages. If changes are made to the PIS and ICD by the IEC, and/or regulatory authority, the amended documents must be submitted to IEC for final approval. The patient will receive a copy of the patient information sheet and his/her signed informed consent documents. The Investigator will obtain a freely given written consent from each patient after an appropriate explanation of the aims, methods, anticipated benefits, potential hazards, and any other aspects of the trial which are relevant to the patient's decision to participate. The informed consent document must be signed and dated by the trial patient before he/she is exposed to any trial-related procedure, including screening tests for eligibility. The Investigator will also sign and date the informed consent document. The Investigator will explain that the patients are completely free to refuse to enter the trial or to withdraw from it at any time, without any consequences for their further care and without the need to justify their decision. If new information becomes available that may be relevant to the trial patient's willingness to continue participation in the trial, a new patient information sheet and informed consent documents will be forwarded to the IECs (and regulatory authority, if required). The trial patients will be informed about this new information, and re-consent will be obtained. Data protection will be handled in compliance with ICH guideline, ISO14155:2011, local laws, and local regulations.

### 3.6 Compliance Reference Document

The Declaration of Helsinki, the consolidated ICH-GCP, ISO14155:2011, and other national law(s) shall constitute the main reference guidelines for ethical and regulatory conduct

## 4.0 Study Population and Subject Recruitment

### 4.1 Study population

The study population involved healthy participants aged 18 above, requiring a single first molar implant with sufficient prosthetic space (≥5 mm), mesiodistal distance ≥8 mm, and buccolingual ridge width ≥6 mm who meets the inclusion and exclusion criteria
Subjects will be recruited where the principal investigators are practicing in university clinic and through private practice that meet the inclusion and exclusion criteria. No minors and vulnerable subjects are involved.

### 4.2 Subject inclusion criteria

- legally competent to provide written informed consent form prior to any study related procedures.
- Subjects of either sex or aged 18 above
- requires replacement of a single missing posterior tooth with adequate mesiodistal dimension (≥8 mm)
- intact adjacent teeth on both sides with existing opposing tooth condition

- good oral hygiene, plaque score <25% bpe1
- adequate keratinized mucosa width (kmw) minimum 6 mm at the edentulous site
- adequate bone volume to accommodate the planned dental implant placement of 5.5 mm diameter and 10 mm in length as verifified by Cone Beam Computed Tomography (CBCT)
- adequate interoccusal distance (crown height space) of at least 6mm measured from alveolar crest to the occlusal table.

4.3 Subject exclusion criteria

- Localized or generalized periodontitis
- Presence of active acute infection
- History of malignancy, radiotherapy or chemotherapy
- Bone metabolic diseases (e.g.: osteogenesis imperfecta, Paget's disease) or current use of medications affecting bone metabolism
- Untreated bruxism or parafunctional habits
- Severe occlusal discrepancy
- Any medical condition contraindicating implant placement or alter daily activities to a level consistent with ASA (American Society of Anesthesiologist) III classification (including cardiovascular, hepatic, renal, gastrointestinal, metabolic, neurologic, pulmonary, endocrine, autoimmune or psychiatric disorders)
- Subjects in need of bone grafting at the site of intended implantation site.
- Subjects that are pregnant

4.4 Obtaining informed consent

The trial patients must personally sign and date the informed consent document before any study specific procedures are performed. Written and verbal versions of the participant information sheet and Informed consent document will be presented to the trial patients detailing no less than: the exact nature of the study; the implications and constraints of the protocol; the known side effects and any risks involved in taking part. It will be clearly stated that the trial subject is free to withdraw from the study at any time for any reason without

prejudice to future care, and with no obligation to give the reason for withdrawal. The person who will obtain the consent must be suitably qualified and experienced and have been authorised to do so by the Principal Investigator. A copy of the signed Informed Consent will be given to the trial subjects. The original signed document will be retained at the study site.Participation in this clinical trial is voluntary and will not affect the dental services to the patient.

4.5 Withdrawal Study Design

Subjects are free to withdraw from the study at any time for any reason. Subjects may also be withdrawn from the study at any time at the discretion of the investigator. It should be understood by all that concerned that an excessive rate of withdrawals could render the study difficult to interpret. Missing data on efficacy assessments could significantly impact on the interpretation of the study results. Hence, unnecessary withdrawal of subjects should be avoided. Should a subject withdraw or is withdrawn, every effort must be made to complete and report the observations as thoroughly as possible.

*4.5.1 Reason for withdrawal*

A subject will be withdrawn from the study for any of the following reasons:
a) Lost to follow-up.
b) Death.
c) Discontinuation of study treatment because of the investigator's clinical judgement that for safety reasons (e.g., adverse event) it is in the best interest of the subject to stop treatment.
d) The subject becomes pregnant.
e) Protocol violation.
f) Any other reason, in the investigator's discretion to initiate stopping the study based on subject safety or if information indicates the study's results may be compromised

*4.5.2 Whether and how subjects are to be replaced:*

To generate a reliable result, a total of 34 participants (n=17/group) was required to detect a statistically significant difference in peri-implant soft-tissue volumetric change between the AHA and SSB workflows, with an actual power of 0.807 as calculated by G Power 3.1. To account for an anticipated 10% dropout rate**,** the final sample size will be 38 participants (n=19/group)**.** Subject that are considered screen failure will be replaces. Subject that has been randomized, received treatment during Visit 2 are considered enrolled and will not be replaced. Investigators should have back-up subjects in their lists should replacement become necessary

*4.5.3 Protocol Deviations*

Deviations from the established procedures are not permitted. If a deviation occurs, the deviation will be recorded in the Protocol deviation Log and shall be notified immediately in the informed consent. The IRB shall be notified according to the requirements of the local IRB.

## 5.0 Study Design

5.1 Type and design of study

This is a prospective, open label, randomized, double arm study for subject in need for dental implant in the posterior mandible with BLX Implant. The group allocation will be as follows:

Group A: Control (Participant will received implant supported restoration conditioned with standard healing abutment and fabricated with standard scan body)

Group B: Test (Participant will received implant supported restoration conditioned with PEEK anatomic healing abutment)

5.2 Randomization

Randomization will be performed prior to implant surgery following CONSORT 2025 guidelines. A computer-generated random number sequence will be prepared in advance, and allocation will be concealed using Sequentially Numbered, Opaque Sealed Envelopes (SNOSE). Randomization will take place during the consent visit. This randomization process will be performed by a (independent) research assistant who is not involved in the data collection or analysis and masked to the trial patients. Trial patients will be enrolled by investigators who will assign trial patients to the respective groups after opening the sealed envelope. Participants will be allocated equally into two groups (n = 19 each). Patients randomized to the control group (SHA) will undergo single-stage surgery at Visit 1, while those randomized to the test group (AHA) will undergo single-stage surgery when the PEEK AHA is available.

5.3 Study Intervention

Study intervention -Test Arm

Study device

Monolithic zirconia screw retained crown conditioned and fabricated with AHA digital workflow

Test treatment name

Group B: PEEK AHA

Test treatment description

Prior to surgery, a digital intraoral scan of the implant site will be recorded as the baseline soft-tissue contour ($T_0$) at Visit 1. During implant placement at Visit 2, a BLC implant (5.5 × 10 mm) will be placed 1 mm subcrestally using a fully guided surgical protocol and immediately condition with polyetheretherketone (PEEK) anatomic healing abutment (AHA XL, gingival height 1.5 mm abutment height of 3 mm) . After 8 weeks of healing period, a digital impression will be captured using an intraoral scanner without removing the AHA ($T_1$) at Visit 3. A full-anatomical, contoured monolithic zirconia crown will then be digitally designed using the

predefined emergence profile available in the EXOCAD software library. The monolithic zirconia crown will be bonded extraorally to a titanium-base abutment (Variobase, Straumann) using a self-curing adhesive luting agent (Multilink Hybrid Abutment, Ivoclar Vivadent).

During Visit 4, prior to delivery of the implant restoration, an intraoral scan will be performed immediately after AHA removal ($T_{2i}$), and 10 minutes after AHA removal ($T_{2d}$). The completed restoration will then be screwed intraorally onto the implant through the occlusal screw-access channel, and the access holes will be sealed with PTFE tape and flowable light-cured composite resin. At Visit 5 for 12 months recall visit, an intraoral scan($T_3$) will be performed to record soft-tissue changes.

Control intervention -Control Arm

Study device

Monolithic zirconia screw retained crown conditioned with titanium standard healing abutment (SHA) and fabricated with standard monoscan body

Test treatment name

Group A: SHA SCANBODY

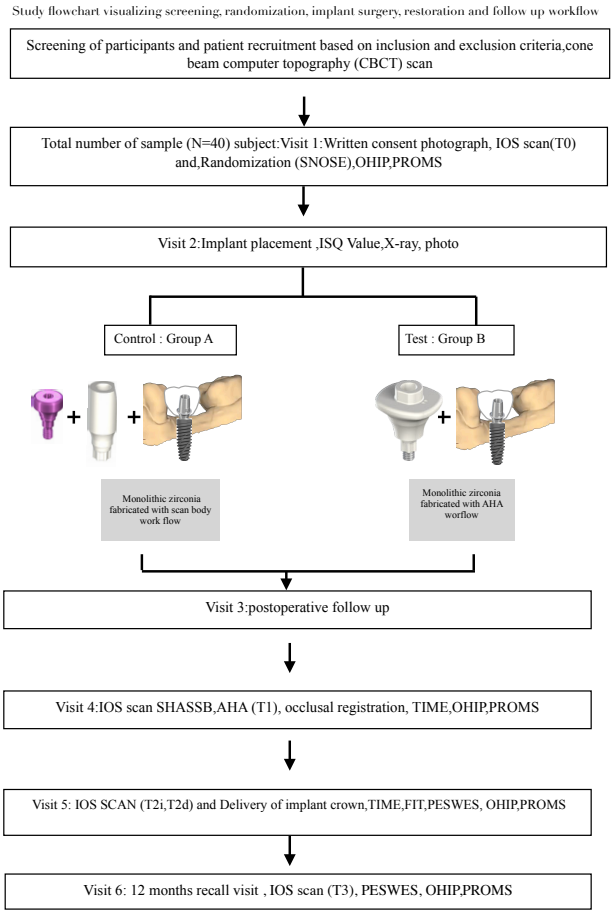
Test treatment description

Prior to surgery, a digital intraoral scan of the implant site will be recorded as the baseline soft-tissue contour ($T_0$) at Visit 1. During implant placement at Visit 2, a BLC implant (5.5 × 10 mm) will be placed 1 mm subcrestally using a fully guided surgical protocol and immediately conditioned with a standard healing abutment (6 mm diameter, gingival height 1.5 mm, abutment height 2 mm), followed by follow up appointment . After an 8-week healing period, a digital impression will first be captured using an intraoral scanner without removing the healing abutment ($T_1$)**,** followed by an additional scan with the standard scan body at Visit 4**.** A full-anatomical, contoured monolithic zirconia crown will then be digitally designed using the the EXOCAD software. The monolithic zirconia crown will be bonded extraorally to a titanium-base abutment (Variobase, Straumann) using a self-curing adhesive luting agent (Multilink Hybrid Abutment, Ivoclar Vivadent).

During Visit 5, prior to delivery of the implant restoration, an intraoral scan will be performed to record peri-implant soft-tissue changes immediately after SHA removal ($T_{2i}$), and 10

minutes after SHA removal ($T_{2d}$). The completed restoration will then be screwed intraorally onto the implant through the occlusal screw-access channel, and the access holes will be sealed with PTFE tape and flowable light-cured composite resin. At Visit 6 for 12 months recall visit,, an intraoral scan ($T_3$) will be performed to record soft-tissue changes.

## 5.4 Study flowchart




## 5.5 Study Endpoints

The primary analysis of volumetric soft tissue changes will be completed after 12 months from baseline ($T_0$)

### 5.5.1 Primary endpoint

- Volumetric analysis of peri-implant tissue changes

The peri-implant soft tissue profile will be assessed from the intraoral scans (IOS). The data collection will consist of four appointments: (1) $T_0$ (Baseline, before implant placement) $T_1$(Digital impression with AHA or SHA/SSB) $T_{2i}$ (Prior to delivery of restoration, digital implant impression immediately after AHA or SHB removal) $T_{2d}$(Prior to delivery of restoration, digital implant impression 10 minutes after AHA or SHB removal) $T_3$(12 months recall visit). Figure 1. Once the digital impressions are obtained, the STL files will be exported into designed software ( Geomagic Control X, Geomagic x Inspect software). The pairs of scans (**$T_0$–$T_3$**), ($T_1$- $T_{2i}$) and ($T_1$- $T_{2d}$) will be superimposed following a strict alignment protocol within a common coordinate system.

For volumetric variation analysis, the digital protocol described by Fernandes et al. (2023) and Lertwongpaisan et al will be applied. After superimposition of the study models, a color map will be generated for quantitative measurement of dimensional variation occurring in the surrounding peri-implant tissue to determine whether volume increases or decreases.

For this analysis, a 3D volumetric region of interest will be selected considering including the soft tissue volume in from the implant platform. The Boolean function will be recorded as Total Volume variation ($TVv_{TO-T3}$, $TVv_{T1-T2i,}$ $TVv_{T1-T2}$) in cubic milimeters and percentages ( Figure 2 a,b)

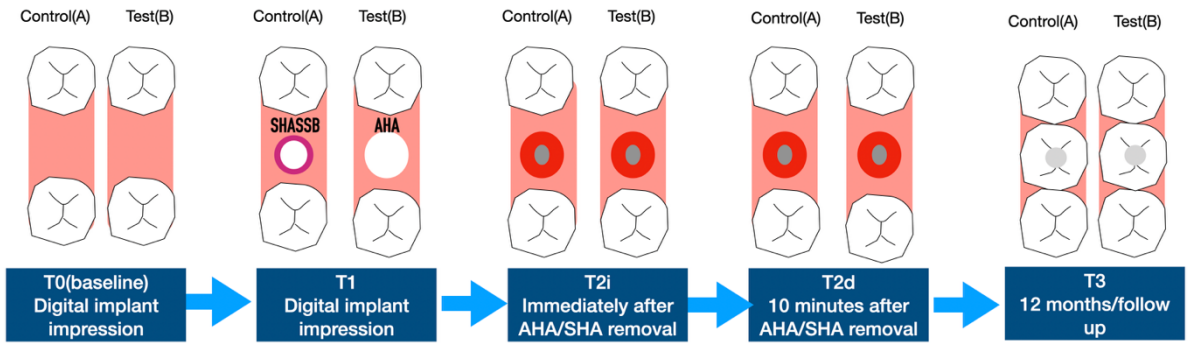



Figure 1: Workflow for intraoral scan timeline for 3D Volumetric Soft-Tissue Analysis

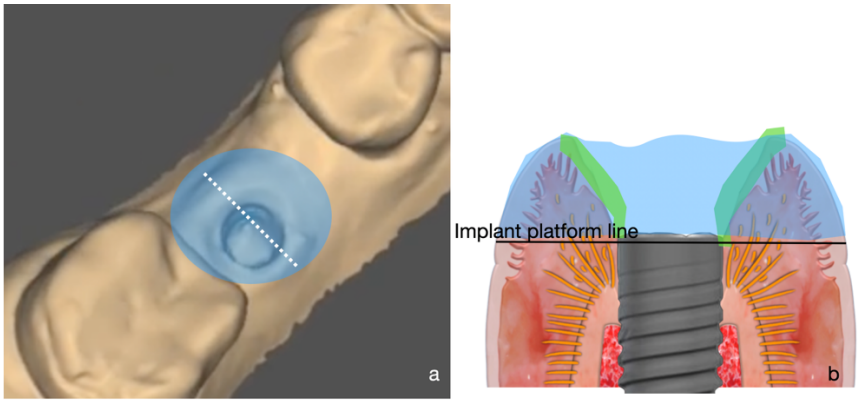



Figure 2. Schematic diagram 3D analysis of the peri-implant volumetric analysis. (a) Buccolingual cross-section (white dash) showing the region of interest (ROI) (b) Schematic diagram in 2d :Total volume volumetric soft tissue changes (blue zone/T0-T3), volumetric changes with SSB/ AHA (T1 (digital impression), T2i (immediately after removal), and T2d (10 minutes after removal)

5.5.2 Secondary endpoint

- Pink and White Esthetic Score (PES/WES), keratinized mucosal width, and mesiodistal papilla height

For the keratinized mucosa width (KMW) and mesiodistal papilla height variation, the STL files of $T_1$ and $T_4$ will be overlapped within the same common coordinate system. A standardized line will be created to serve as horizontal reference for vertical measurement from mucogingival junction and free gingival margin. The mean difference of these variables represent KMW height variation (KMHv), Mesial papilla height variation(MPHv) and distal papilla height variation(DSHv). (Figure 3)

The PES will be used to evaluate peri-implant soft tissue esthetics and will be assessed at 3 and 12 months after implant placement. PES includes seven parameters: mesial papilla, distal papilla, soft tissue level, soft tissue contour, root convexity, soft tissue color, and soft tissue texture. Each parameter is scored from 0 to 2, where 0 indicates an obvious discrepancy with the contralateral tooth, 1 indicates a minor discrepancy, and 2 indicates no discrepancy. The maximum possible PES is 14, with scores ≥8 considered esthetically acceptable and scores ≥12 indicating an excellent result.

The WES will be used to evaluate the esthetic integration of the implant crown and will be assessed based on five parameters: tooth outline, volume, shade, surface texture, and

translucency. Each parameter is scored from 0 to 2, following the same scoring criteria as PES. The maximum WES is 10, with scores ≥6 considered esthetically acceptable.

PESWES evaluation will be performed using standardized intraoral photographs (vestibular and occlusal views) captured with a DSLR camera and macro lens. Clinical photographs will be calibrated using the clinical crown length, and each restoration will be compared with the contralateral natural tooth.

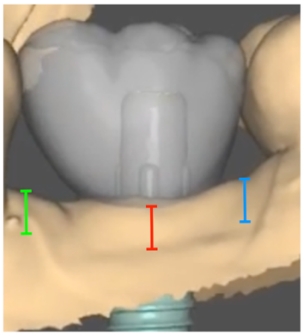


Figure 3. Schematic diagram in 2D of coordinated standard line from mucogingival junction to free gingival margin in KMW height variation (KMHv,red), Mesial papilla height variation(MPHv,blue)and distal papilla height variation(DSHv,green)

5.5.3 Additional analysis

- Patient reported outcome measures ((PROMS), Oral Health Impact Profile (OHIP)

Patient satisfaction outcome measures (PROMS) will be assessed using a visual analogue scale (VAS) to capture subjective perceptions of each digital workflow. At each IOS assessment visit, participants will complete five VAS items evaluating: (1) comfort during digital impression taking, (2) perceived duration of the procedure, (3) convenience of the procedure, (4) overall satisfaction, and (5) willingness to undergo the same procedure again. Each item will be scored on a 0–10 cm calibrated line anchored at “unsatisfied” (0) and “fully satisfied” (100). Assessments will be performed immediately following each impression procedure and at the 12-month follow-up.

The Oral Health Impact Profile (OHIP) will be used to assess the impact of treatment on oral health-related quality of life. OHIP questionnaires will be administered at baseline

(preoperative, Visit 1), IOS digital impression (Visit 3), restoration placement (Visit 4), and during follow-up visits at 12 months post-restoration. (Visit 5),

- Time, fit

In the clinical phase**,** the time required for each procedural step will be recorded separately. For the control group, impression-taking will include removal of the healing abutment, insertion of the scan body, intraoral scanning of the implant site and adjacent teeth, scanning of the opposing arch, maxillomandibular relationship registration, removal of the scan body, and reinsertion of the healing abutment. For crown delivery, the recorded steps will include removal of the healing abutment, try-in of the monolithic implant crown, interproximal adjustment, occlusal adjustment, screw retention, and closure of the occlusal access channel. The same clinical timings will be recorded for the test group.

The implant crown fitting accuracy will be evaluated using four parameters: marginal fit**,** proximal contact**,** occlusal contact**,** and crown morphology**.** Marginal fit will be assessed using a dental explorer with a tip diameter of 150 µm. Proximal contact will be evaluated using waxed dental floss, and occlusal contact will be assessed with red articulating film (AccuFilm II; Parkell Inc). Crown morphology will be examined for anatomical accuracy in cusp, ridge, pit, and fissure formation. Each parameter will be scored according to the established 3-point scale: *Clinically Excellent* (score 1), *Clinically Acceptable* (score 2), or *Correction Needed* (score 3). Total fit scores will therefore range from 4 (excellent in all categories) to 12 (poor in all categories).

## 6.0 Treatment Procedures

### 6.1 During trial

Surgical procedures will be carried out under local anaesthesia using aseptic technique. Participants will rinse with 0.12% chlorhexidine for 60 seconds preoperatively. A mid-crestal incision with a full-thickness mucoperiosteal flap will be raised, and osteotomy preparation and implant placement will follow the manufacturer’s recommended drilling sequence.

In both groups, a BLC implant (5.5 × 10 mm) will be placed, and primary stability will be assessed using insertion torque and implant stability quotient (ISQ). For Group A (control), flaps will be repositioned and conditioned immediately with a titanium SHA, followed by suturing with 4-0 Vicryl. For Group B (test), flaps will be repositioned and conditioned with a PEEK AHA.

At 8 weeks, digital impressions will be taken for both groups using an intraoral scanner ($T_1$). The datasets obtained from the IOS will be exported in STL format for processing in EXOCAD software and subsequent milling of the restorations. Prior to delivery of the restoration, intraoral scans will be recorded immediately after ($T_{2i}$) and 10 minutes after ($T_{2d}$) removal of the AHA and SHA. The restorations will then be tried in, adjusted, and finalized according to the study protocol. At the 12-months recall visit, an intraoral scan ($T_3$) and all evaluated outcome parameters will be recorded at each scheduled follow-up visit.

6.2 Visit Windows

Subject need to be seen within the following windows

| Visit | Treatment details | Schedule |
|---|---|---|
| Visit 1 | Informed consent, IOS Scan (T0), intraoral photo, OHIP, PROMS | Within 14 days of enrollment |
| Visit 2 | Implant placement, ISQ Value, X-ray, Photo, | 3 weeks after visit 1 |
| Visit 3 | Postoperative review | 2 weeks after visit 2 |
| Visit 4 | IOS scan SHASSB, AHA (T1), OHIP, PROMS | 8 weeks after visit 2 |
| Visit 5 | IOS scan (T2i, T2d), Delivery of implant crown, PESWES, | 4 weeks after visit 3 |
| Visit 6 | 12 months recall visit, PESWES, IOS (T3) OHIP, PROMS | 12 months after Visit 4 |

6.3 Rescue Procedure

If the implant fails to osseointegrate, it will be removed, and no other treatment options will be offered to the patient.

## 7. Assessment of Safety

Adverse events (AE) will be monitored and collected by the study team from the point of signed consent until 30 days (for non-serious AEs and serious AEs) after the last day of study participation. For each AE, a detailed explanation will be obtained from the subject and subject's medical record. All AEs will be recorded on the CRFs.

7.1 Definition

7.1.1 Adverse Event (AE)

An AE is defined as any untoward medical occurrence or unintended disease or untoward clinical signs (including abnormal laboratory findings) in subjects, users or other persons, whether related to the intervention medical device. It includes events related to the intervention medical device or the control, events related to the procedures involved and or users and other persons, it is restricted to the events related to the investigational medical device.

7.1.2 Adverse Device Effect (ADE)

An adverse event related to the use of an intervention medical device. The definition includes adverse events resulting from insufficient use, inadequate instructions for use, deployment, implantation,installation, or operation or any malfunction of the intervention medical device. This definition includes any event resulting from user error or from ntentional misuse of the intervention medical device.

7.1.3 Serious Adverse Event (SAE)

An adverse event is considered serious if it results in any of the following:

i. Death

ii. A life-threatening AE

iii. Requires inpatient hospitalization or prolongs existing hospitalization

iv. Persistent disability/incapacity

v. Medically important event by the Investigator

7.14 Serious Adverse Device Effect (SADE)

An adverse device effect that has resulted in any of the consequences characteristic of a serious adverse device effect.

a) Anticipated Serious Adverse Device Effect (ASADE)

ASADE is an effect which by its nature, incidence, severity, or outcome has been identified in the risk analysis report.

b) Unanticipated Serious Adverse Device Effect (USADE)

USADE is an effect which by its nature, incidence, severity or outcome has not been

identified in the risk analysis report.

7.2 Evaluation and Recording of AE

7.2.1 Severity of Event

Mild: Events require minimal or no treatment and do not interfere with the patient's daily activities.

Moderate: Events result in a low level of inconvenience or concern with the therapeutic measures. Moderate events may cause some interference with functioning.

Severe: Events interrupt a patient's usual daily activity and may require systemic drug therapy or other treatment. Severe events are usually potentially lifethreatening or incapacitating.

7.2.2 Relationship to Investigational Medical Device

For all collected AEs, the clinician who examines and evaluates the patient will determine the AE's causality based on temporal relationship and his/her clinical judgment. The degree of Causality will be graded using the categories below.

Definitely:

The relationship of the AE and the study device or the study procedure can be established

Probably:

While a clear relationship to the study device or to the study procedure cannot be established, the AE is associated with an expected AE or there is no other medical condition or intervention, which could explain the occurrence of such an event.

Possibly:

There is no clear relationship between the AE and the study device or study procedure; however, one cannot conclude that there is no relationship.

Unrelated:

There is no relationship between the AE and the study device or study procedure. This may include but is not limited to the incident being an expected outcome of a previously existing or concurrent disease, concomitant medication, or procedure the subject experienced.

Expectedness:

The Investigator will be responsible for determining whether an AE is expected or unexpected. An AE will be considered unexpected if the nature, severity, or frequency of the event is not consistent with the risk information previously described for the study products.

7.3 Evaluation and Recording of AE

7.3.1 Reporting of Adverse Events and Serious Adverse Event

The investigator will record all reportable events with start dates occurring any time after informed consent is obtained until 30 days (for non-serious AEs and Serious AEs) after the last day of study participation. At each study visit, the Investigator will inquire about the occurrence of AE/SAEs since the last visit. Events will be followed for outcome information until resolution or stabilization.

7.3.2 SAE/SADE Reporting

In the case of a SAE/SADE, the Principal Investigator must notify the Sponsor within 1 working day after the Investigator first learns of the event. The IRB/IEC must also be notified according to their notification policies.

7.3.4 USADE/ASADE Reporting

In the case of an USADE/ASADE, the Investigator shall notify the Sponsor and respective IRB/IEC as soon as possible, but in no event later than 10 working days after the Investigator first learns of the effect. The Sponsor is responsible for conducting an evaluation of an USADE/ASADE and shall report the results of such evaluation to the respective IRB/IEC and the Investigator within 10 working days after the Sponsor first receives notice of the USADE /ASADE Report.

Pregnancy

If a female trial subject becomes pregnant during the trial, she must be followed up until the outcome of the pregnancy is known. The outcome of the pregnancy must be reported to the Sponsor on the appropriate SAE CRF. The follow-up treatment will be continued but the patient will be considered as a drop-out.

Allergy

Some people might have an allergic reaction to titanium alloy or nickel-titanium alloy after implant placement such as rash or hives, swelling in the soft tissues of the mouth, chronic

inflammation in the gums around the implant, problems with wound healing and chronic fatigue syndrome. In case of allergic reaction, the investigator must notify Sponsor within 1 working day after the investigator first learns of the events.

Serious Adverse Events Reporting

Attention to*:*
Dr Nur Hafizah Binti Kamar Affendi
Consultant Prosthodontist/Senior Lecturer
Centre of Restorative Dentistry Studies,
Faculty of Dentistry, Universiti Teknologi MARA,
Selangor
Phone: +60132878284
Email: hafizah_kamar@uitm.edu.my

## 8. Statistical method

8.1 Study Design and sample size calculation

The sample size is calculated based on findings from previous studies evaluating dimensional peri-implant soft-tissue changes as the primary outcome measured within a standardized region of interest (ROI) **(**Crespi et al., 2024; Fernandes et al., 2023). The sample size was calculated using G*Power 3.1.9.4 for a t-test comparing two independent means (two groups**)**. The analysis was performed using a two-tailed test, with an effect size (Cohen's d) of 1.0, a significance level (α) of 0.05, and a power (1–β) of 0.80. Based on these parameters, a total of 34 participants (n=17/group) was required to detect a statistically significant difference in peri-implant soft-tissue volumetric change between the AHA and SSB workflows, with an actual power of 0.807 as calculated by G Power 3.1. To account for an anticipated 10% dropout rate**,** the final sample size will be 38 participants (n=19/group)**.**

8.2 Statistical Method

Data analysis will be performed using IBM SPSS Statistics V25 (IBM Corp., Armonk, NY, USA). The significance level will be set at $p \leq 0.05$. Descriptive statistics will be presented as means and standard deviations for continuous variables and as frequencies and percentages for categorical varibales. For inter-intra rater reliability, Cohen's kappa statistics, interpreted according to Landis and Koch's benchmarks, will be used to assess inter-rater reliability. For the outcome analysis:

Volumetric variables at the different time points and specific region of interest will be evaluated with an independent sample t-test or Mann–Whitney *U* test to disclose differences for continuous nonpaired variables.

PES/WES. TIME, FIT, OHIP and PROMs score comparison between the two groups will be conducted using independent *t*-tests if data are normally distributed; otherwise, the Mann–Whitney *U* test will be applied.

| Objective | Independent variable (Predictor) | Dependant Variable (outcome) | Data Type | Normality Test | Two Group comparison |
|---|---|---|---|---|---|
| Volumetric soft-tissue change (healed site baseline vs after crown loading) | Standard healing abutment vs PEEK AHA | Volumetric soft-tissue change ($mm^3$) | Continuous | Shapiro–Wilk | normally distributed: Independent t-test , not normally distributed: Mann–Whitney U |
| Immediate and time-dependent peri-implant soft-tissue change after abutment removal | Standard healing abutment vs PEEK AHA | Dimensional soft-tissue change | | | |
| 3a. PES/WES | SHA VS PEEK AHA | PES/WES score | Score/ ordinal | | |
| 3b. Keratinized mucosal width | Healing abutment type: Standard vs PEEK AHA | KMW (mm) | Continuous/ ordinal | | |
| 3c. Mesiodistal papilla height variation | Healing abutment type: Standard vs PEEK AHA | Papilla height variation (mm) | | | |
| 4a. Time efficiency | Workflow component: Standard scan body (SSB) vs PEEK AHA | Time taken (minutes) / number of steps | | | |
| 4b. Crown-fitting accuracy score | Workflow component: SSB vs PEEK AHA | Crown-fitting accuracy score | Score/ ordinal | | |
| 5. OHIP and PROMs | Workflow component: SSB vs PEEK AHA | OHIP score and PROMs scores | Score / ordinal | | |

8.3 The Level of significance to be used

Where applicable, 95% confidence intervals will be calculated to support descriptive statistics.

8.4 Procedure for Accounting for missing, Unused and Spurious Data

Missing or spurious data will not be imputed.

8.5 The selection of subject to be included in the analyses and analysis data set.

The selection of subjects to be included in the analyses will include per protocol set (PP) for all primary and secondary analyses. The PP population will include all participants who received the allocated implant intervention and completed the study without major protocol deviations, with complete clinical and digital datasets available for analysis..

## 9. Data management

Required clinical data for this study will be collected by Principal Investigator. All clinical data will be collected and recorded in the clinical database using a case report form attached in the appendix.

### 9.1 Data Entry

Data will be entered into the database using a paper case report form for all subjects who informed consent is obtained. The principal investigator or authorized designee is responsible for the completion and signature of all CRFs

### 9.2 Data Validation and Data Query

Data validation checks will be performed on entered data to assure data quality, and to generate data queries (missing data, suspected data error [out of range values and nconsistent data]). If data validation leads to discrepancies, data management will generate queries. Any other questions or queries arising from data validation checks will be printed and communicated to site via Data Clarification Form/Query Form. The investigator or designee will resolve the query using the Data Clarification Form/Query Form, and sign and date it before returning it to CDM. All the above procedure will be carried out according to the Straumann Standard Operating Procedures.

### 9.3 Data Handling & Record Keeping

CRF Data will be managed by Principal Investigator

## 10. Administrative Matters

10.1 Privacy and Confidentiality of Personal Information

All personal data gathered in this trial will be treated in strictest confidence by investigators, Sponsors personnel and independent ethics committee. No data will be disclosed to any third party without the express permission of the subject concerned, except for sponsor personnel (monitor, auditor), independent ethics committee and regulatory organizations in the context of their investigation related activities that, as part of the investigation will have access to the CRFs and source documents. The Investigator will ensure that the confidentiality of the subjects' data will be preserved. The patients will not be identified by their names, but by an identification system, which consists of an assigned number in the trial. Documents that are not for submission to the Sponsor (eg. the signed Informed Consent documents), will be maintained in the Investigator Study File by the Investigator in strict confidence. The trial subjects are not given access to their study data during the entire the study.

10.2 Finance and Insurance

In case of any damage or injury occurring to a patient in association with the intervention medical device or the participation in the trial, the principal investigator has contracted an insurance which covers the liability of the Investigator in the trial in compliance with the laws.

10.3 Record Keeping

The Investigator must maintain adequate and accurate records to document the conduct of the study and substantiate the study data. These Essential Documents (ED) are: -

- Signed Confidentially Agreement
- Signed clinical agreement with the sponsor
- Protocol and amendment
- IRB/IEC Approval

- Informed Consent Document
- Case Report Forms
- Curriculum vitae of Investigators
- Signed Financial Disclosure
- Other appropriate documents in accordance with GCP

10.4 Publication Policy

At the end of the trial, one or more manuscripts for publication may be prepared in collaboration between the Investigator(s) offered authorship and the Straumann under Investigator Initiated Studies. Results from the trial must be reported in entirety in a responsible and coherent manner and results from subsets should not be published in advance as approved in clinical trial agreement.

Appendices

## Curriculum Vitae.....

**NUR HAFIZAH KAMAR AFFENDI (DR.)**
**Senior Lecturer/Consultant Prosthodontist**
**MDC:4364 PRO0100**

Centre of Restorative Dentistry Studies
Faculty Of Dentistry, Sungai Buloh Campus
Universiti Teknologi MARA
Jalan Hospital, 47000, Sungai Buloh Selangor
Email: hafizah_kamar@uitm.edu.my
Tel No: 0132878284

## Academic qualification.....

Diplomate International Congress of Oral Implantology (ICOI) USA ,2016

Fellowship International Congress of Oral Implantology (ICOI) USA,2016

Certificate Advanced Program in Prosthodontics, Certificate Advanced Program in Implant Dentistry New York University USA, 2016

Doctor Of Dental Surgery, University Science Malaysia, 2008

## Specialty Areas.....

| Main Field | Sub field | Field (Specialty) | Keywords |
|---|---|---|---|
| Health Science | Dentistry | Prosthodontics | Veneer, dental aesthetics, smile design, fixed prosthodontics |
| | | Implant Dentisry | Implant abutment, immediate implant, implant overdenture, full arch implant |

## Current and Past Careers.....

**Universiti Teknologi Mara (UiTM), Sungai Buloh Campus (2011-present)**

- Senior Lecturer (DUG56) and Consultant Prosthodontist (*DSEC* No: PRO0100) at Centre of Restorative Dentistry (7 Oct 2022- current)
- Senior Lecturer (DUG54) and Prosthodontist at Centre of Restorative Dentistry Studies (12 Jan 2017-7 Oct 2022)
- Lecturer (DUG51) at Centre of Restorative Dentistry Studies (16 July 2016-16 Dec 2016)
- Trainee Lecturer (DUG45 and DUG51P) at Centre of Restorative Dentistry Studies, Faculty of Dentistry UiTM (16 July 2011-16 July 2013)

**Visting Prosthodontist (Private Practice)**

- Artius Dental Specialist Centre, Jalan Tun Razak, Kuala Lumpur (2020-current)
- Klinik Pergigian Pakar Ortodontik OMNI, Kota Damansara (2018-2022)

**Segi University of Oral Health Centre, Kota Damansara (2011-2015)**

- Visiting Prosthodontist/Lecturer at Prosthodontic Clinic

**Ministry of Health, Malaysia (2008-2001)**

- First Year Dental Officer (U41) at Klinik Pergigian Jalan Gambut, Klinik Pergigian Berserah, Hospital Tunku Ampuan Afzan,Pahang
- Dental Officer (U44) at Klinik Pergigian Raub, Hospital Raub, Pahang

## Administrative Responsibilities

- Coordinator for MQA DCP902, DCP903 from Jan 2024-Mac 2024
- Committee of Research Group, Tier 5, Excellence Entity (Maxillofacial Implant Research Group) from Jan 2022- current
- Clinic Manager and Inventory. (Prosthodontics Specialist Clinic) 2022-2023
- Lecturer In charge (Implantology Module) from 2016- current
- Curriculum Task Review Committee for DS974 (Doctor in Prosthodontic)
- Coordinator (Dr in Prosthodontics) DCP902, DCP903 from July 2021-July 2011
- Coordinator (DClintdent Prosthodontics) in Prosthodontics from July 2021-2022
- Main Coordinator (Preclinical MSD701) Prosthodontic from July 2021-2022
- Lecturer In charge (Clinical) DPR 602 Prosthodontic from July 2020-2021
- Lecturer In Charge (Preclinical) DPR602 Prosthodontic from July 2018-2020
- Module Coordinator DPR 602 Prosthodontic form July 2017-July 2018
- Progress Coordinator DPR602 Prosthodontic from July 2016-2018

## Invited Expert

*International Engagements*

- **Person in charge** for CADCAM workshop and clinical attachment (Postgraduate in Restorative and Prosthodontics) at Mahidol University, Faculty of Dentistry, Thailand -July 2023
- **Appointed Field Expert/Forum** for INTERNATIONAL TEAM IMPLANTOLOGY Study Club Director for Southeast Asia Annual Scientific Meeting Jakarta,Indonesia Fenruary 20-21 2025

*National Engagements*

- **Expert Asessor** Outcome Based Education (OBE)/Malaysian Qualification Framework (MQF) for Stand Alone Micro Credentials (SAMC) Implant for Beginner, MAHSA University, 16 October 2025- 16 October 2027
- **Panel of Assessor** for Postgraduate Program in DR In Paediatric Dentistry, Curriculum Review Committee,Universiti Teknologi MARA. 1 April 2025 – 31 December 2025
- **Panel of Assessor** for **MQA (FULL ACCREDITATION)** Postgraduate Diploma in Implant Dentisrty (IMU, Kuala Lumpur) 19 March 2025- 20 March 2025

- **Panel of Assessor** for Postgraduate Program in DClintdent Restoratif (Prosthodontik), Curriculum Review Committee, School of Dental Science, University Science Malaysia. 1 April 2021 – 31 December 2021
- **Clinical Trial Investigator** for *Nitium Technology Sdn Bhd* (funded grant by Ministry of Science Technology/MOSTI), Jan 2021-Sept 2022
- **Appointed Field Expert/Key Opinion Leader** at *Ultra dent Inc USA*. 2016-2022 for workshop, publications and consultation of product
- **Appointed Field Expert / Key Opinion Leader** at *Straumann Group* MY 2024-2024 for workshop, publications, research and consultation of product

*University/Faculty Engagements*

- **Judge** for Video Competition UiTM International Dental Scientific Symposium. 19 March 2024
- **Panel of Assessor** DUCS (Internal Research Grant Scheme). 1 Januari 2021- 31 Dec 2021
- **Panel of Assessor** for Prosthodontic and Undergraduate Candidate intake for Dclintdent Prosthodontics April 2023

## Invited Speaker

- **Beyond Implant Restoration : Navigating Material and Design Choices in Modern CADCAM Dentistry** : Malaysia International Dental Show (MIDS) 22 July 2025
- **A Review of Restorative Space for Successful Approach in Digital Implantology:** Ani Dent Dental Education, Taiwan Oct 27 2024
- **Essential Insight on Digital Implant Restoration by Digital Dentistry Association**, Oct 11, 2024
- **What's Next? Essential Skills to Kickstart Your Practice** 6 June 2024
- **New Gen Dentist GT: Grand Hyatt Kuala Lumpur: How to incorporate high level implant service into your practice?** May 26th 2023
- **A Review of Restorative Space for Successful Approach in Digital Implantology**: ITI (Straumann and Ancora Imparo) Aug 6th 2023
- **On site Course: Essential Esthetic Dentistry: Veneer and Partial Veneer:** Kl Trillion, Ancora Imparo June 11th 2023
- Webinar: **The Fundamental Concept for Implant Supported Prostheses** by Ancora Imparo May 25th-May 26th 2022
- **Implant Induction Course:** Ancora Imparo and Straumann Inc, May 25th-May 26th
- 2022
- **How essential is Implant Dentistry in everday Practice** May 8th 2022
- 12th Biennial Congress of Asian Academy of Prosthodontics AAP2021, Indonesia: **Implant Overdenture Using CADCAM Milled Titanium Bar with Locator Attachment**, Sep 12th 2021
- Workshop on Photography Course, Universiti Teknologi MARA, Feb 5th 2021
- **Laser Application Workshop**, Universiti Sains Malaysia-All you wanted to know about Diode Laser April 29th 2019
- Ulradent Product Inc, Selangor- **All you wanted to know about Diode Laser**, April 7th 2019

- 11th Biennial Congress of Asian Academy of Prosthodontics: AAP2018, Kuala Lumpur **Enhancing Clinical Dentistry with Diode Laser.** September 21- 23,2018
- 11th Biennial Congress of Asian Academy of Prosthodontics: AAP2018, Kuala Lumpur: **Sequential and simplified approach for implant supported fixed implant restoration- a clinical report.** September 21- 23,2018
- A Dental Implant Course(AUDIC), Kuala Lumpur : **Basic Prosthodontics in Implant Dentistry.**
- Malaysia International Dental Exhibition and Conference 2017, Kuala Lumpur: **Immediate Implant Placement Immediate Provisionalization** July 28-30, 2017
- ICOI Autumn Congress, Singapore: **Surgical Technique to enhance coronal contour of alveolar ridge**. October 27-29, 2016
- 14th Annual Implant Alumni Symposium, New York, NY: **Clinical Advantages of Surgical Tunnel Technique;** November 5, 2015
- 14th Annual Implant Alumni Symposium, New York, NY: **Poly-D-Lactic Acid vs Conventional GBR for Ridge Augmentation**. November 5, 2015
- NYUCD/NYUCN Annual Research Day and Student Research: **Implant Placement Lateral to Inferior Alveolar Nerve**. April 23-24, 2015

## Reviewer.....

*Journal Reviewer*

- BMC Oral Health: *Sequential Multidisciplinary Protocol for Dental Implant Rehabilitation in Ectodermal Dysplasia: A clinical case report* 29 July 2025
- BMC Oral Health- Receiving and Living with Dental Implant : *A Qualitative Interview Study from Patients*. Perspective in Germany 7 April 2025
- Archives of Orofacial Science( Scopus Indexed) – *Accuracy of Dental Implant Placement under 3D Surgical Guide Template* : A Systematic Review, 2025 May 7
- Elective research Project: *Reviewer (1. Odontometric of primary molars in selected group of Malaysian Children, 2.Post-traumatic Stress disorder (ptsd) among dental and medical students diagnosed with covid-19 at Uitm Sungai Buloh,3. Preferred method for selection of Acrylic Resin Teeth among Prosthodontic Patients Treated by UITM Dental Students. 2024 April 15*
- International Journal of Research and Reports in dentistry (Scopus Indexed)*: Immediate implant placement with and without soft tissue graft*: A Scoping Review 2024 May 2024
- Malaysian Journal of Medicine & Health Sciences (Scopus-Indexed) *Laser in Dentistry: An Overview*" 2024 August 9
- Archives of Orofacial Science(Scopus-Indexes): Advertising the tooth : *An Analysis of content and Compliance of Malaysian Dental Clinic Facebook and Instagram Post* 2024 Jun 12
- European Journal of Dentistry (Scopus-Indexed ) *Anti-candidal Efficacy of Erythrosine with Nano tio2 and Blue LED-mediated Photodynamic Therapy on Candida albicans biofilms on acrylic resin. A Preliminary study*. 2022 Nov 15
- Archives of Orofacial Science(Scopus-Indexed): *Oral rehabilitation of a patient with generalized inflammatory gingival overgrowth exacerbated by felodipine: a case report.* 2020 Nov 24

- Malaysian Journal of Science Health and Technology(My Cite-Indexed): *Cleanliness of Canal Walls Following Retreatment of Maxillary First Molar*. 2021 March 31

## Acquired Research Grants.....

- A prospective Randomized Clinical Trial on Digital Impressions with Standard Scan Body Versus Anatomic Healing Abutment for the Fabrication of posterior Single Implant Restorations: (Investigator Initiated Studies (International Grant, Switzerland – **USD 65000** PHD Research Funding-ongoing
- Automated Teeth Detection and Labelling for Dental Charting using Convolutional Neural Network on 3d Intraoral Scans (Imap Industry Matching Program **RM253,352.00**)- ongoing
- The Fracture Resistance of Cad Cam Screw Retrievable and Cement Retained Implant Supported Prostheses Cemented to A Novel Prefabricated Abutment a Comparative Analysis (Ducs Research Grant From Universiti Teknologi MARA, Malaysia **RM 20,000**)- 18 April 2020- 18 April 2024 - completed
- A Prospective, Open Label, Randomized, Double Arm, Multicenter Study to Evaluate the Performance of Nitident Tuah Porous Niti Dental Implants In Single Tooth Gap In The Posterior Mandible – External Industrial Grant from Nitium Technology Sdn Bhd **(RM97,430**)- completed

## Reasearch Project .....

*PHD (DS950)*

1. Co- Supervisor: Surface Porosity expedite Implant Stability in restoring single tooth gap in the posterior mandible ( Nor Wati @ Nur Atikah Mustafa ( 2020833964)- ongoing

*Master (Postgraduate Coursework) DDS933/932*

1. Main Supervisor: Fracture Resistance and fractographic analysis of CADCAM SRCR Implant supported crowns bonded to various titanium-based abutment (Ammar Yaseer Bin Abdul Hakim @ Abdul Khakin (2021811818)- completed (2021-2024)
2. Main Supervisor: Predictive modelling of Tooth Angulation and underlying alveolar bone wall thickness (Jumana babiker (2017424598) -completed (2016-2020)

*Undergraduate (DPC601)*

1. Main Supervisor: A new paradigm in dental Education: Exploring the student Perception, Experience, and the psychological impact in the midst of COVID 19 pandemic
2. Main Supervisor: The incorporation of Social Media Marketing by Dentist in Malaysia
3. Co-Supervisor: A follow up study of the success of single implant and implant supported crown placed at the Faculty of Dentistry (UiTM
4. Co-Supervisor: A Survey on Preference for Continuing ProfessionalDevelopment among General Dental Practitioners in Malaysia: A Pilot Study

## Publications

*Journal articles*

2025

1. **Affendi NH**, Hakim AA, Ahmad R, Mustafa NW, Yusof MM, Mahmud M. The Effect of Crown Design on Fracture Strength and Mode of Implant-supported Molar Crown Bonded to Titanium-based Abutment. The Journal of Contemporary Dental Practice. 2025 Aug 20;26(6):565-672.

2024

2. **Affendi NH**, Ahmad R, Wah LT, Hamid NF, Hakim AY. Screw-retrievable cement-retained implant restorations: A scoping review of fracture strength and clinical performance. Dental and medical problems. 2024;61(2):257-68.
3. Hakim Ay, khakin a, Ahmad R, **Affendi NH**. Fracture toughness and fracture mode of cement-retained versus screw-retrievable cement-retained implant-supported crowns: a pilot study: Received 2024-03-01; Accepted 2024-03-26; Published 2024-03-27. Journal of Health and Translational Medicine (JUMMEC). 2024 Mar 27:341-8.
4. NWNA M, **NH KA**, E S, MAA K, MH I, LK T, MZ S. In vitro evaluation of cytotoxicity and genotoxicity of porous nickel titanium dental implants produced by metal injection molding technique. Journal of Biomedical Materials Research Part B: Applied Biomaterials. 2024 Jan;112(1):e35306.

2023

5. **Affendi NH**, Bohari NF, Bin Salihan AR, Rosman NA. Education Perception, Experience, and Anxiety Level Among Undergraduate Dental Students in Malaysia During the Covid 19 Pandemic. Malaysian Journal of Medicine & Health Sciences. 2023 Jul 1;19(4).
6. **Affendi NH**, Babiker J, Mohd Yusof MY. CBCT assessment of alveolar bone wall morphology and its correlation with tooth angulation in the anterior mandible: a new classification for immediate implant placement. Journal of periodontal & implant science. 2023 Jan 6;53.
7. Hamid NF, Ahmad R, Lim TW, **Affendi NH**, Ariff TF. Integration of Massive Open Online Course (MOOC) in Conventional Teaching and Learning for Fixed Prosthodontics-A Case Study. Integration.;12:25-023.
8. Mustafa NW, Ahmad R, Ahmad Khushaini MA, **Kamar Affendi NH**, Ab Ghani SM, Tan SK, Ismail MH, Goo CL, Kassim MZ, Lim TW, Teh LK. Porous NiTi Dental Implant Fabricated by a Metal Injection Molding: An in Vivo Biocompatibility Evaluation in an Animal Model. ACS biomaterials science & engineering. 2023 Dec 1;10(1):405-19.

2022

9. **Affendi NK**, Suzuki T, Cho SC. Screw-retained restoration of a facially shifted postextraction implant in the esthetic zone with immediate provisionalization. Journal of Osseointegration. 2022;14(1):26-30.
10. Rahimi, S.N., Tengku Mohd Ariff, T.F., **Kamar Affendi, N.H**. and Ahmad, R., 2022. Surface modifications of dental implant and its clinical performance: a review. Compendium of Oral Science (CORALS), 9(1), pp.52-66.

11. **Affendi NH**, Babiker J, Yusof MY. A Narrative Review of Alveolar Bone Analysis and CBCT Classification related to Immediate Implant Placement in The Anterior Maxilla.
12. Zulkefle NJ**, Affendi NH.** Multidisciplinary approach for aesthetic rehabilitation in gummy smile and fluorosis: a case report. Indonesian Journal of Prosthodontics. 2022 Jun 1;3(1):1-5.

2021

13. Babiker J, **Affendi NH**, Yusof MY, Chu SJ. Qualitative and Quantitative Assessments of Alveolar Bone Dimension and Its Correlation with Tooth Angulation in the Anterior Maxilla for Immediate Implant Placement. The Journal of Contemporary Dental Practice. 2021 Nov 1;22(11):1238.

2020

14. **Kamar Affendi NH**, Ahmad R, Vahidi F, Hassan MZ, Rahimi SN. The Integration of a Dual-Wavelength Super Pulsed Diode Laser for Consistent Tissue Ablation in the Esthetic Zone: A Case Series. Case Reports in Dentistry. 2020 Dec 4;2020.
15. **Affendi NH,** Hamid NF, Razak MS, Nudin II. The Pattern of Social Media Marketing by Dentist in Malaysia. Malaysian Dental Journal. 2020 Jan 1(1).

2019

16. Yusof MY, Mah MC, Reduwan NH, Kretapirom **K, Affendi NH**. Quantitative and qualitative assessments of intraosseous neurovascular canals in dentate and posteriorly edentulous individuals in lateral maxillary sinus wall. The Saudi dental journal. 2019 Dec 1;32(8):396-402.

2018

17. Hamid NF, **Affendi NH**, Anwar NE, Ikhwan NF. A survey on preference for continuing professional development among general dental practitioners in Malaysia: A pilot study. European Journal of General Dentistry. 2018 May 1;7(2):41.

2017

18. **Kamar Affendi NH,** Abd Hamid NF. Unsplinted Metal Reinforced Implant Retained Overdenture for An Edentulous Arch. Compendium of Oral Science (COS). 2017; 4:40-6.

2016

19. Choucroun G, Mourlaas J, **Kamar Affendi NH**, Froum SJ, Cho SC. Sinus floor cortication: classification and prevalence. Clinical implant dentistry and related research. 2017 Feb;19(1):69-73.

*Proceeding Paper*

2024

1. **Nur Hafizah Kamar Affendi** . Management of implant prostheses complications placed in inadequate space using a digitally assisted workflow and reorganized approach. The 14th biennial Congress of the Asian Academy of Prosthodontics (AAP)
2. Mustafa NW, Ab Ghani SM, Amin IM, Khushaini MA, **Affendi NH**, Tan SK, Sulaiman E, Ahmad R. Interactions of Cell-Porous NiTi Biomaterial and Nickel Ion Release. International Dental Journal. 2024 Oct 1;74:S303.

2023

3. Ammar Yaseer Abdul Hakim*, Rohana Ahmad, **Nur Hafizah Kamar Affendi**: The effect of crown design on Fracture Resistance of Implant Supported Prostheses

Between Cement Retained and Screw Retrievable Cement Retained: A Pilot Study: The British Society of Prosthodontics

4. Ammar Yaseer Abdul Hakim*, Rohana Ahmad, **Nur Hafizah Kamar Affendi**: The effect of crown design on Fracture Resistance of Implant Supported Prostheses Between Cement Retained and Screw Retrievable Cement Retained: A Pilot Study: Research, Innovation &Entrepreneurship International Symposium, Faculty of Dentistry, Universiti Kebangsaan Malaysia.

2021

5. **Affendi NH**, Bohari NF, Bin Salihan AR, Rosman NA. : Education Perception, Experience, and Anxiety Level Among Undergraduate Dental Students in Malaysia During the Covid 19 Pandemic. 11th Dental Students Symposium UiTM

2020

6. **Affendi NH,** Hamid NF, Razak MS, Nudin : The Pattern of Social Media Marketing by Dentist in Malaysia. 10th Dental Students Symposium UiTM

2019

7. Hidayat MF, **Kamar Affendi NH**, Hasirin RA, Wan Mohd Noor WA. Evaluation of peri-implant soft and hard tissues around dentalimplants placed at the Faculty of Dentistry, UiTM. 9th Dental Students Symposium UiTM

2017

8. **Affendi NHK,** Biological and biomechanical considerations in Immediate Implant Placement and Immediate Provisionalization. 13th IDCMR Congress

2016

9. Hamid NF, **Affendi NH**, Anwar NE, Ikhwan NF. A survey on preference for continuing professional development among general dental practitioners in Malaysia 9th Dental Students Symposium UiTM

*Academic Book*

1. BOOK CHAPTER : Bridging Societies in a VUCA World through Innovation- Chapter 2: GP Gingival Scan
2. BOOK CHAPTER: Bridging Health Professionals and Communities through Innovation: Chapter 5: SET IT RIGHT: Teeth Set Up Made Easy

**Thesis/Panel/Postgraduate examiner**.....

| Role | Candidate Name | Date |
|---|---|---|
| Internal Examinership (Treatment planning, Case Completed) | Postgraduate Professional Examination (Clinical)<br>**Doctor In Prosthodontics (DCP903)**<br>1. Fazliza Binti Mohd Fathoni (2021616816)<br>2. Ammar Yaseer Bin Abdul Hakim @ Abdul Khakin (2021811818)<br>3. Bibi Aisiah binti Babu Osman (2021479908)<br>4. Muhammad Nur Izham bin Khairuddin (2021252098)<br><br>Postgraduate Professional Examination (Clinical)<br>**Doctor In Prosthodontics (DCP902)**<br>5. Fazliza Binti Mohd Fathoni (2021616816) | 2-3 September 2025<br><br>27-29 Aug 2024 |

| | | |
|---|---|---|
| | 6. Ammar Yaseer Bin Abdul Hakim @ Abdul Khakin (2021811818)<br>7. Bibi Aisiah binti Babu Osman (2021479908)<br>8. Muhammad Nur Izham bin Khairuddin (2021252098)<br><br>**Doctor In Prosthodontics (DCP902,DCP903)**<br>1. Mas Linda Mohd Osman (2020296868)<br>2. Nadiyah Abdullah Zawawi (2020276436)<br><br>**Doctor In Prosthodontics (DCP902,DCP903)**<br>1. Muhammad Amal bin Abdul Wahab (2020422184)<br>2. Nadhirah binti Ghazali (2020284294)<br>3. Mohd Khairul Firdaus Bin Mazlan (2020673264)<br><br>**Doctor of Clinical Dentistry Prosthodontic (DCP901)**<br>1. Nurul Hanim Bt Othman (2018866358)<br>2. Nurul Jannah Bt Zulkefflee (2018693768)<br><br>**Doctor of Clinical Dentistry Prosthodontic (DCP901)**<br>1. Jumana babiker (2017424598)<br>2. Mohd Zulkifli binti Kassim (2017629726)<br>3. Siti Nadia binti Rahimi (2017685426)<br>4. Noor Aaina binti Zainon (2017614812)<br><br>**Doctor of Clinical Dentistry Prosthodontic (DCP901)**<br>1. Rostam Iffendi Idris (201665374)<br>2. Juzailah Binti Roffie (2016839962)<br>**3.** Sayfaldeen Muhannad Ali (20162020) | 16-17 Aug 2023<br>27-29 Aug 2024<br><br>2-5 Sept 2022<br>16-17 Aug 2023<br><br>15-18 Nov 2021<br><br>15-18 Nov 2021<br><br>15 – 17 Sept 2020 |
| Panel (Defense Research Proposal) | Dr In Prosthodontics, Faculty of Dentistry, UiTM<br>1. Muhammad Amal bin Wahab (2019260078)<br>Dr In Prosthodontics, Faculty of Dentistry, UiTM<br>1. Nur Abidah Binti Mohamed Shukri (2024494474) | 14 May 2020<br><br>29 July 2025 |

**Innovations/Intelectual Property (IP)**.....

2024
IIDENTEX: Ai Dentify (Enhancing Dental Care with an AI Driven Color Coded System)

2022
IIDENTEX: International Invention & Innovation in Dentistry Exhibition (VERSY T Abutment). 14 November 2022 **(PI:2023001625)**

2021
E-Content Development Competition :Integration of Massive Open Online (MOOC) Fixed Partial Denture Prostheses DFP901 20-27 August 2021

2020
IIDENTEX: International Invention & Innovation in Dentistry Exhibition (GPGSCAN). 20 October 2020

2019
IIDENTEX: International Invention & Innovation in Dentistry Exhibition: SET IT RIGHT **IP (CRLY00020349)**

## Accolades and Awards

2025
1. Asean Dentistry Award 2025 1st Place in Single Tooth Implant Supported Restoration
2. Asean Dentistry Award 2025 2nd Place Complex Aesthetic Restoration

2024
1. BRONZE award: IIDENTEX AiDentify

2022
2. Gold award: Versy T ABUTMENT IIDENTEX: Effective and Retentive

2021
3. Kim Award: Removable Partial Denture Asian Academy of Prosthodontist
4. BRONZE award: IIDENTEX GP G scan
5. Reviewer's Choice Award: ERP 2022 'Education Perception, Experience, and Anxiety Level Among Undergraduate Dental Students in Malaysia During the Covid 19 Pandemic'

2020
6. Anugerah Perkhidmatan Cemerlang
7. Gold AWARD NATIONAL E CONTENT DEVELOPMENT: MOOC FIXED PARTIAL DENTURE PROSTHESES competition (20-27TH August 2021
8. Reviewer's Choice Award: ERP 2020 'The incorporation of Social Media Marketing by Dentist in Malaysia'

2019
9. 3rd place: ICOI Autumn Congress, Singapore: Surgical Technique to enhance coronal contour of alveolar ridge. Nur Hafizah Binti Kamar Affendi; Sang-Choon Cho; Stuart J. Froum; Peter M. Loomer
10. Silver award: IIDENTEX 'SET IT RIGHT'

2014
11. Perdana Scholarship Award USA

## Taught course

*Postgraduate Coursework) DCP902/DCP903*
1. Veneer, Partial Veneer and Fixed Prosthodontics
2. Impression in Fixed Prosthodontics
3. Restorative Materials
4. Principles of Aesthetic Dentistry
5. Bone Evaluation
6. Treatment planning for edentulous maxilla and mandible with implant

7. Surgical Considerations in implant
8. Complications of implant
9. Others: seminar, journal club, module test, preclinical project

*Undergraduate (DPR602)*

4. Veneer, Partial Veneer and Fixed Prosthodontics
5. Complete cast crown, metal ceramic crown and all ceramic crown
6. Digital CADCAM
7. Aesthetic and tooth discolouration management
8. Iatrogenic Factors in Fixed Prosthodontics
9. Introduction to Implant Prosthodontics

*Diploma (DCS 151)*

10. Fixed Prosthodontics Armamentarium

## Professional Affiliations and Membership.....

2023

1. ITI Study Club Director (Malaysia 3)

2022

2. President Digital Dentistry Association (DDA)

2020

3. International Team for Oral Implantology (ITI)

2019

4. Malaysian Association of Aesthetic Dentistry (MAAD)
5. Malaysian Association of Prosthodontist (MAP) (lifetime)
6. Academy of Osseointegration (AO)

## Services/Student/Community.....

2025

1. World Oral Health Day 2025 in collaboration with Haleon (CE/2025/00764

2024

1. Advisor: DIGITAL DENTAL ASSOCIATION : Intraoral Scanner Day
2. ITI Mega Study Club ( Ancora 1,Ancora 2, Malaysia 1, Malaysia 3)

2023

3. Pensyarah Pengiring Sukan Antara Universiti
4. Pensyarah Pengiring MscD Restoratif dan Mscd Prosthodontic ke Faculty of Dentistry, Mahidol University.

2022

5. AJK Dental Student Scientific Symposium

2021

6. PICK (PROGRAM IMMUNISASI COVID KEBANGSAAN) Dewan Berlian, UiTM Puncak Alam 7 Jun 2021 – 22 Ogos 2021

2020

7. Mentor Mentee Cohort 2021-2025

2019

8. Deputy Chairperson: An Overview of Fixed Prosthodontics (21.3.2023- 22.3.2023)
9. Program Ramah Mesra Alumni dan Pelajar Tahun Akhir PPSG

2017

10. Global Clinical case Contest by Denstply Sirona Academy: Supervisor

2016

# Curriculum vitae


**MOHD YUSMIAIDIL PUTERA MOHD YUSOF (DR.)**
**Professor & Consultant Forensic Odontologist**
**BDS MSc PhD MOHRE FPFA FICD**

Scan me

**Address**: Faculty of Dentistry
Universiti Teknologi MARA
47000 Sungai Buloh
Selangor

**Email**: yusmiaidil@uitm.edu.my
**Phone**: +60361266536


## *Education*

**MOHRE (Health Research Ethics) University of Malaya, 2021**
Dissertation: Development of Standard Electronic Informed Consent Checklist (STeICC) for Research Ethics Review

**Ph.D. (Forensic Odontology) Ghent University, Belgium, 2016**
Thesis: Contemporary Dental Age Estimation Models in Children and Sub-adults

**PG. Dip. (Advanced Medical Imaging) Katholieke Universiteit Leuven, Belgium, 2014**
Dissertation: Assessment of Neurovascular Canals in the Lateral Maxillary Sinus

**M.Sc. (Forensic Odontology) Katholieke Universiteit Leuven, Belgium, 2012**
Dissertation: Dental Age Estimation for Malay Children Based on All Permanent Teeth Types

**B.D.S (Dental Surgery) University of Malaya, Malaysia, 2008**

## *Specialty Areas*

| MAIN FIELD | SUB-FIELD | FIELD (SPECIALTY) | KEYWORDS |
|---|---|---|---|
| Medicine and Health Sciences | Dentistry | Forensic Odontology | Dental age estimation, Bitemark analysis, Meta-analysis |
| | | Radiation Protection (Oral and Maxillofacial Radiology) | Cone beam CT, Repeat analysis, Forensic radiology |
| | Bioethics | Health Research Ethics | Electronic informed consent, IRB/REC oversight, Clinical trial |

## *Current and Past Careers*

**Ministry of Health, Malaysia (2008 – 2010)**

- First Year Dental Officer (U41) at Queen Elizabeth Hospital and Luyang Dental Clinic, Kota Kinabalu, Sabah (15 July 2008 – 31 July 2009)
- Senior Dental Officer (U44) at Duchess of Kent Hospital and Sandakan Dental Clinic, Sandakan, Sabah (1 August 2009 – 31 July 2010)

**Universiti Teknologi MARA (UiTM), Sungai Buloh Campus (2010 – present)**

- Full Professor (VK7), Center for Oral and Maxillofacial Diagnostics and Medicine Studies, Faculty of Dentistry UiTM (16 March 2023 – present)
- Associate Professor (DUG56) and Consultant Forensic Odontologist (*National Dental Specialist Registration No: FOD 00005*), Center for Oral and Maxillofacial Diagnostics and Medicine Studies, Faculty of Dentistry UiTM (1 January 2019 – 15 March 2023)
- Senior Lecturer (DUG54) at Center for Oral and Maxillofacial Diagnostics and Medicine Studies, Faculty of Dentistry UiTM (8 August 2016 – 31 December 2018)
- Lecturer (DUG51) at Center for Oral and Maxillofacial Diagnostics and Medicine Studies, Faculty of Dentistry UiTM (1 August 2013 – 7 August 2016)
- Trainee Lecturer (DUG45 and DUG51P) at Center for Oral and Maxillofacial Diagnostics and Medicine Studies, Faculty of Dentistry UiTM (1 August 2010 – 30 July 2013)

***Administrative Responsibilities***

- Director of Institute of Pathology, Laboratory and Forensic Medicine (I-PPerForM), UiTM (1 September 2023 – 31 August 2025)
- Deputy Director (Health & Wellness) for Research Nexus UiTM (ReNeU), Office of Deputy Vice Chancellor (Research and Innovation), UiTM Shah Alam (July 2022 – August 2023)
- Head of Center for Oral and Maxillofacial Diagnostics and Medicine Studies, Faculty of Dentistry UiTM (September 2017 – September 2019)
- University Main Committee Member (JKIPU) from 1 October 2023 to 30 September 2025.
- Principal Research Fellow at Institute of Pathology, Laboratory, and Forensic Medicine (I-PPerForM) from January 2017 to February 2022
- University Research Main Committee Member (JKIPU) from 1 October 2023 to 30 September 2023.
- UiTM Selangor State Executive Committee Member (JKEN) from 1 September 2023 to 31 August 2025.
- University's Center of Excellence Postgraduate Academics Committee Member (JAPPKU) from 1 September 2023 to 31 August 2025.
- Institutional Biosafety Committee Member (IBC) UiTM from 1 March 2023 to 28 February 2025.
- Research Ethics Committee Member (REC) UiTM from January 2017 to December 2020
- Procurement Committee Member, Sungai Buloh Campus UiTM
- Faculty's Ranking Champion, Faculty of Dentistry UiTM
- Faculty Research Committee Member
- Module Coordinator (Forensic Odontology and Diagnostic Imaging) from May 2016 to May 2021.

***Community Leaderships***

- Mentor for SMJK Perempuan Cina Pulau Pinang for National Science Challenge Semi Final Level 2022 organized by Academy of Sciences Malaysia (ASM). 3-27 August 2022.
- Volunteer and Head of Diagnostics Cluster for Dental Health Program at Indigenous Village Kuala Woh, Perak. 29 February 2020.
- Volunteer and Head of Diagnostics Cluster for Dental Health Program at Indigenous Village Air Karah, Lenggong, Perak. 6-7 July 2019.
- Head of Dental Section for National Council of Professors (MPN)'s National Health Screening Program in Semporna, Sabah. 26-29 March 2017.

***Invited Expert***

*International Engagements*

- **Visiting Professor** at the Institute of Legal Medicine and Faculty of Dentistry, University of Turin, Italy. 6 – 28 May 2023.
- **Person in-charge** for the initiation and development of Memorandum of Agreement (MoA) between University of Turin, Italy (Human Identification and Forensic Odontology Laboratory) and Universiti Teknologi MARA (Institute of Pathology, Laboratory and Forensic Medicine, I-PPerForM). 27 May 2022.
- **Research Fellow** at Faculty of Dental Medicine, Universitas Airlangga, Indonesia. 1 May – 31 December 2022.
- **Visiting Professor** at the Faculty of Dentistry, University of Puthisastra, Cambodia. 22 November 2021 (3 years).
- **Invited expert** for international exhumation and identification of New Zealand soldiers and families died during the World War II at Commonwealth War Grave in Terendak Military Camp, Malacca *(Ops Te Auraki with National Institute of Forensic Medicine, Ministry of Health, the Royal Armed Forces and New Zealand Government)*. 7 July-12 July 2018.
- **Head** of Scientific Committee for International Congress on Forensic Medicine and Sciences (ICFMS) 2017 at National Library, Kuala Lumpur. 24 – 25 October 2017.
- **Chairman** of Pre-congress Workshop on Forensic Odontology in conjunction with International Congress on Forensic Medicine and Sciences (ICFMS) 2017 at Faculty of Dentistry, Universiti Teknologi MARA. 23 October 2017.
- **Invited expert** for International Disaster Victim Identification Operation *(Identification of Drowned Victims from a Capsized Boat; A co-operation between Governments of Malaysian and Indonesian)* at Kota Tinggi, Johor, Malaysia. 25-30 July 2016.
- **Invited expert** for international exhumation and identification of Australian soldiers and families died during the World War II at Commonwealth War Grave in Terendak Military Camp, Malacca *(Ops Reunites with National Institute of Forensic Medicine, Ministry of Health, the Royal Armed Forces and Australian Government)*. 30 April-2 June 2016.

*National Engagements*

- **Judge for Oral presentation** at *16th Postgraduate Conference Faculty of Dentistry University of Malaya*, Balai Ungku Aziz, University of Malaya, Kuala Lumpur. 19 September 2023.

- **Elected Chairman of Patient Complaint Bureau** for *Malaysian Dental Association (MDA).* 3 July 2023 – 31 July 2025.
- **Head Judge for the Scientific Research Competition** at the *21st Annual Scientific Meeting of International Association for Dental Research (IADR) Malaysian Section*, Acappella Suite Hotel, Shah Alam, Selangor. 24 September 2022.
- **Editorial Board Member** for the Malaysian Dental Journal (MDJ) – MyCite-indexed.
- **Judge for Oral Presentations** *at the International Islamic University Malaysia (IIUM) 10th Dental Students' Scientific Virtual Symposium*. 27 April 2021.
- **Chairman for Technical Working Group on Forensic Odontology Specialty** for *National Dental Health Research Priority Setting (JTPBKP)* under Oral Health Program, Ministry of Health, Putrajaya. 12 April 2021.
- **Panel of Assessor** for Malaysian Qualifications Agency (MQA) to audit *Level 8 MQF Doctor in Forensic Odontology Program UKM (MQA/PA 14388).* 3 February 2021.
- **Judge for the Scientific Research Competition** at the *19th Annual Scientific Meeting of International Association for Dental Research (IADR) Malaysian Section*, Acappella Suite Hotel, Shah Alam, Selangor. 10 October 2020.
- **Appointed Field Expert** at *Entruss Ventures Sdn Bhd* for IP, Publications and Commercialization services. 27 July 2020.
- **Board of Study Member** for Postgraduate Program Study 1+3 Years, Faculty of Dentistry UKM for *Doctor in Forensic Odontology Program*. 11 June 2020.
- **Judge for Poster presentation** at *12th Postgraduate Conference Faculty of Dentistry University of Malaya*, Balai Ungku Aziz, University of Malaya, Kuala Lumpur. 18 September 2019.
- **Working Group Member** for *Quality Assurance Program for Dental Radiography Service* under Atomic Energy License Act 304 at Medical Radiation Regulation Unit (BKRP), Ministry of Health, Putrajaya. 20 September 2018.
- **Judge for e-Poster presentation** at *1st National Joint Specialist Conference*, Istana Hotel, Kuala Lumpur. 9-11 March 2018.
- **Invited expert** for National Disaster Victim Identification Operation *(Ops Maahad Tahfiz 2017 to identify 22 charred bodies from fire incident)* at National Institute of Forensic Medicine, Kuala Lumpur Hospital. 14 September 2017.

*University Engagements*

- **Committee Member** for Technical Evaluation Criteria on Research Officer Scheme Promotion (Scheme Q), Universiti Teknologi MARA. 30 April 2024.
- **Head of Task Force** for FRGS Evaluation under the Clinical and Health Sciences Domain at Reseach Management Center (RMC) UiTM. 15 February 2023.
- **Board of Study Member** for Postgraduate Program Study 1+3 Years, Faculty of Dentistry UiTM for *Doctor in Oral & Maxillofacial Surgery Program*. 2 November 2020.
- **Panel of Assessor** to Audit Document on Promotion of Tier 4 (Research Entity) to Tier 3 (Center of Excellence) – *Advanced Analytics Engineering Centre (AAEC)* at Faculty of Science Computer and Mathematics, Universiti Teknologi MARA, Shah Alam, Selangor. 14 September 2020.
- **Judge for the Mega Innovation Carnival 2020** at Foundation Center, Universiti Teknologi MARA, Dengkil Campus, Selangor. 6-8 March 2020.
- **Chairman** for 9th Dental Students' Scientific Symposium Faculty of Dentistry Universiti Teknologi MARA. 9-10 April 2019.

- **Judge for 26th Malaysian Dental Association** (MDA) *Scientific Convention & Trade Exhibition 2019*, Kuala Lumpur Convention Center. 19 January 2019.
- **External assessor** in the *Medical Imaging Research Colloquium* organized by Centre of Medical Imaging Study, Faculty of Health Sciences, Universiti Teknologi MARA, Puncak Alam Campus, Selangor. 9 July 2018.
- **Invited trainer** for *Basic Teaching Course at Medical Education Research and Development Unit (MeRDU)*, Faculty of Medicine, Universiti Teknologi MARA. 21 November 2017.
- **Head** of Scientific Committee for Disability We Care Conference 2017 at Faculty of Dentistry, Universiti Teknologi MARA. 25-26 November 2017.

***Invited Speaker***

- Invited speaker at 14th International Dental Students Symposium (IDSS) Faculty of Dentistry, University Teknologi MARA. ***DNA of UiTM Dental Students: Are You Mutating into Something?*** 23 April 2024.
- Invited speaker for 31st Malaysian Dental Association Scientific and Trade Exhibition (MDA-SCATE) at Kuala Lumpur Convention Center. ***Implementing AI Technologies in Clinical Practice: How Far Can You Go Without Losing Your Job?*** 28 January 2024.
- Invited speaker at Research Workshop: *Penghasilan Data kajian Secara Kreatif* organized by Jabatan Kesihatan Wilayah Persekutuan (Pergigian) at International Youth Center (IYC), Cheras, Kuala Lumpur. ***Introduction to Statistical Analysis using RStudio.*** 21 June 2023.
- Invited speaker at National Oral Health Research Initiative Conference (NOHRI) organized by the Faculty of Dentistry, University of Malaya at Nexus Connexion Conference & Event Center, Bangsar South, Kuala Lumpur. ***Artificial Intelligence in Radiology***. 16 October 2022.
- Invited speaker at Workshop on Ethics Procedure for Ethics Review Committee (ERC) organized by UiTM Research Ethics Committee (REC) at Hotel UiTM Shah Alam. ***Enhancing Quality of Ethical Review Audit Following SIDCER-FERCAP Standards.*** 26 July 2022.
- Invited speaker at Writing, Publication and Research Workshop organized by Jabatan Kesihatan Wilayah Persekutuan (Pergigian) at International Youth Center (IYC), Cheras, Kuala Lumpur. ***Elements of Manuscript Structure & Tips and Tricks for Easy Publishing.*** 17 May 2022.
- Guest speaker at 4th International Conference of Forensic Odontology & Child Abuse in Association with IAMLE organized by Faculty of Dental Sciences, King George's Medical University, Lucknow, India. ***Orofacial Trauma in Children: The Incriminating Signs of Abuse.*** 31 March 2022.
- Invited speaker at 23rd International Dental Students' Scientific Conference (DSSC) Faculty of Dentistry, University of Malaya. ***Data-driven Dentistry: A New Skillset or a Job Killer?*** 23 March 2022.
- Guest speaker at DENTOCON 2 organized by Jamia Milia Islamia University (JMI) and Innovative Education and Scientific Research Foundation (IESRF), New Delhi, India. ***Artificial Intelligence in Dentistry.*** 23 January 2022.

- Invited speaker as part of the Visiting Professor Program at the Faculty of Dentistry, Universitas Sumatera Utara (USU), Medan, Indonesia. ***Forensic Odontology and Disaster Victim Identification***. 21 September 2021.
- Speaker at Research Webinar Series #1 organized by Research Office Faculty of Dentistry UiTM. ***How to Publish in Q1/Q2 Journals***. 9 August 2021.
- Invited speaker and demonstrator for workshop on Age Estimation in Forensic Odontology: A Hands-on Training organized by AIMST University. ***Dental Age Estimation: Key Issues and Ways Forward (Lecture) & Dental Age Estimation in Sub-adults (Hands-on)***. 24 July 2021.
- Invited speaker for The Art to Developing HSR Proposal Course organized by Jabatan Kesihatan Negeri Selangor (Pergigian). ***Literature Review and Methodology*** on 23 March 2021.
- Invited speaker at Malaysian Association of Pediatric Dentistry (MAPD) 2021 Virtual Scientific Conference & Annual General Meeting - Imaging in Paediatric Dentistry - More than Meets the Eye. ***CBCT - What, When Why and How***? 13 March 2021.
- Invited speaker at International College of Dentists (ICD) Section XV Webinar. ***Managements of Bite Mark Injuries for GPs and First Liners*.** 24 February 2021.
- Invited speaker at Pediatric Dentistry – Charting the Future 2020 (in conjunction with Malaysian Association of Pediatric Dentistry Annual General Meeting). ***Imaging of Temporomandibular Joint.*** 21 November 2020.
- Invited speaker for Malaysian Association of Pediatric Dentistry (MAPD) Webinar Series 2020. ***Incriminating Dental Trauma in Children – Signs and Symptoms of Abuse*.** 26 August 2020.
- Invited speaker for Deputy Vice Chancellor Research and Innovation (TNCPI) Office Webinar Series 2020. ***Automated Dental Dating for Age Estimation in Forensic Human Identification: Rise of the Machine… Learning***. 21 August 2020.
- Invited speaker for CPD Talk at Faculty of Dentistry, Universiti Sains Islam Malaysia (USIM), Pandan Indah Campus, Kuala Lumpur. ***Writing Proposal Grant for Young Researchers: Tips & Tricks for Success.*** 21 February 2020.
- Invited speaker for Symposium on Additive Manufacturing at Amirkabir University of Technology, Tehran, Iran. ***Accuracy of 3D Printed Bite Mark Models Reconstructed from Commercially Available 3D Handheld Scanner***. 22 January 2020.
- Invited keynote speaker for 6th Indo Pacific Academy of Forensic Odontology World Conference (INPAFO) at Chandigarh, India. ***Is Conventional Radiographic Age Assessment Really a Non-Invasive Method?*** 16 February 2019.
- Invited plenary speaker for 26th Malaysian Dental Association Scientific Convention & Trade Exhibition (MDA-SCATE) at Kuala Lumpur Convention Center (KLCC), Kuala Lumpur. ***Influence of Cone Beam CT in Clinical Decision Making: To Scan or Not To Scan?*** 18 January 2019.
- Invited speaker for 11th Postgraduate Conference 2018 at Faculty of Dentistry, University of Malaya. ***Data Visualization in Dentistry***. 25 July 2018.
- Invited speaker for Paediatric Age Assessment Workshop at Sungai Buloh Hospital entitled ***Dental Age Assessment Methodologies***. 4th May 2017.
- Invited speaker for Dental CPD at Tawau Hospital entitled ***Dental Age Estimation and Reporting: How to Deal with It?*** 28 March 2017.

### *Academic/Industrial Attachment*

- Staff Exchange Program at Department of Oral & Maxillofacial Radiology, Faculty of Dentistry, Mahidol University, Bangkok, Thailand under International Dental Collaboration of Mekong River (IDCMR) scholarship. 14 August – 14 September 2018.
- Staff Exchange Program at Amirkabir University and Shahid Beheshti University of Medical Sciences, Tehran, Iran. 15 – 30 January 2020.

### *Thesis Examiner/Viva Chairman/Panel*

| ROLE | CANDIDATE NAME | DATE |
|---|---|---|
| External Thesis Examiner | PhD, School of Dentistry, USM, Kubang Kerian<br>Samiya Riaz - **Occlusal characteristics and sex prediction potential of permanent maxillary posterior teeth in the Malay population** | 2 Oct 2023 |
| | PhD, School of Dentistry, USM, Kubang Kerian<br>Siti Sarah Ayub - **Effectiveness of education and activity-based interventions to improve oral health in children at different age groups. A systematic review and meta-analysis** | 8 Aug 2022 |
| | Master of Dental Science, School of Dentistry, USM, Kubang Kerian<br>Abdullah Abdulkhaleq Mohammed Al-Selwi - **3D Morphometric Evaluation of Palatal Rugae among Malaysian Malay Population** | 7 Feb 2022 |
| Internal Thesis Examiner | PhD DS950, Faculty of Dentistry, UiTM<br>1. Nagham Mohammed Abdullah Al-Jaf, 2011897606 – **Cortical Bone Thickness in Different Sagittal Skeletal Relationship: Assessment and Predictive Modelling Using Artificial Neural Network** | 17 Jun 2019 |
| | 2. Mohamed Samih Alsrouji, 2014866558 - **The Effect of an Implant-retained Overdenture on Residual Ridge Resorption of the Premaxilla** | 3 Mei 2018 |
| Viva Chair (Defense of Research Proposal) | PhD Candidate (DS950) Faculty of Dentistry, UiTM<br>1. Siti Mariam Ab Ghani,2017836982<br>2. Nurul Huda Hasan, 2017406444<br>3. Jasmina Qamaruz Zaman, 2014440728<br>4. Fathia Atis Eshtewi Almrkz, 2019642982 | 9 April 2018 |
| | | 23 Oct 2020 |
| | MDSc/MScD Candidate (DS750) Faculty of Dentistry, UiTM<br>1. Izzati Mohd Shaharuddin, 2020355103<br>2. Nurul Latifah Zainal Abidin, 2020274128 | 14 Aug 2020 |
| | | 19 April 2021 |
| Viva Chair (PhD and Clinical Doctorate Viva) | PhD DS990, Faculty of Dentistry, UiTM<br>1. Luay Thanoon Younis, 2010342363 | 5 April 2018 |
| | DClinDent Prosthodontics, Faculty of Dentistry, UiTM<br>1. Rostam Iffendi Idris, 2016229792 | 5 May 2020 |
| | DClinDent Orthodontics, Faculty of Dentistry, UiTM<br>1. Azaitun Akma Shahrin, 201665374 | 6 May 2020 |
| Panel (Defense of Research Proposal) | DClinDent Prosthodontics, Faculty of Dentistry, UiTM<br>1. Nurul Hanim Othman, 2018693768 | 26 Feb 2021 |
| | DClinDent Periodontology, Faculty of Dentistry, UiTM<br>1. Nik Fatin Sarah Nik Mhd Abdul Nasser, 2018208626 | 28 Sep 2020 |
| | MScDPH, Faculty of Dentistry, UiTM<br>1. Badrul Munir Mohd Arif, 2020652696 | 30 Dec 2020 |

## *Journal Reviewer*

| JOURNAL | ARTICLE TITLE | PERIOD |
|---|---|---|
| Frontiers Public Health *(WoS-indexed)* | Hybrid HCNN-KNN Transfer Learning Model Enhances Age Estimation Accuracy in Orthopantomography | 27 Feb – 10 March 2022 |
| Forensic Imaging *(Scopus-indexed)* | Age estimation and legal majority through the Olze method in a Brazilian population | 10 July – 23 July 2021 |
| Imaging Science in Dentistry *(Scopus-indexed)* | Prevalence of soft tissue calcifications: a retrospective study on digital panoramic radiographs | 17 April – 6 June 2021 |
| Imaging Science in Dentistry *(Scopus-indexed)* | Anatomical Evaluation of Mandibular Premolars in Saudi Population: An In-Vivo Cone Beam Computed Tomography Study | 9 December – 26 December 2020 |
| Archives of Orofacial Sciences *(Scopus-indexed)* | Tooth Morphometry and Pattern of Palatal Rugae Among Monozygotic (MZ) Twins in Malaysia | 19 November – 19 December 2020 |
| Archives of Oral Biology *(WoS-indexed)* | Developmental Stages of Third Molars as Radiographic Parameters for Age Estimation of Russian Adolescents | 14 October – 4 November 2020 |
| Imaging Science in Dentistry *(Scopus-indexed)* | Radiographic and Micro-Tomographic Evaluation of Mediate and Immediate Endodontic Treatment Protocols of Rat Molars with Induced Periapical Lesion | 10 June - 22 June 2020 |
| Archives of Orofacial Sciences *(Scopus-indexed)* | A CBCT Study on The Morphometry of The Mandibular Molars and Their Relative Root Lengths to The Mandibular Height | 17 June - 8 July 2020 |
| Journal of International Medical Research *(Scopus-indexed)* | Studying of Selective Common Factors Affecting Radiographic Quality and Related Exposure Doses | 24 April – 7 May 2020 |
| Archives of Oral Biology *(WoS-indexed)* | Oral Health of Overweight and Obese Children and Adolescents: A Comparative Study with a Multivariate Analysis of Risk Indicators | 2 – 16 March 2019 |
| Archives of Oral Biology *(WoS-indexed)* | Reliability of Palatal Rugoscopy for Sexual Dimorphism in Forensic Dentistry: A Systematic Literature Review and Meta-Analysis | 10 August 2018 – 7 October 2018 |
| International Journal of Engineering & Technology *(Scopus-indexed)* | Design and Development Approach of Smart Glove for Post Stroke Rehabilitation | 8 – 28 August 2018 |
| International Journal of Engineering & Technology *(Scopus-indexed)* | Development and Evaluation of a Spot Sensor Glove for The Tactile Prosthetic Hand | 8 – 28 August 2018 |
| Journal of International Medical Research *(Scopus-indexed)* | Dental Age Assessment on Panoramic Radiographs: Comparison between Two Generations of Young Finnish Subjects | 22 June – 6 July 2018 |
| Imaging Science in Dentistry *(Scopus-indexed)* | Evaluation of The Precision of Different Radiological Approaches while Planning to Secure Anatomical Structures in Implant Surgery | 30 July 2018 – 17 – August 2018 |
| Annals of Dentistry *(MyCite-indexed)* | Anthropometric Measurements of The Mandible Using Cone-Beam Computed Tomography Dataset | 12 – 18 April 2018 |

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|---|---|---|
| Archives of Oral Biology *(WoS-indexed)* | Effectiveness of Three Age Estimation Methods Based on Dental and Skeletal Development in a Sample of Young Brazillians | 10-28 August 2017 |
| Imaging Science in Dentistry *(Scopus-indexed)* | Precision of Aiming with a Portable X-ray Device (Nomad Pro 2) Compared to a Wall-mounted Device in Intra-oral Radiography. | 1-12 April 2018 |
| European Journal of Forensic Science *(Scopus-indexed)* | Study of Palatal Rugae Pattern for Establishing Individuality | 8-20 February 2016 |

## *Professional Affiliations & Memberships*

i. Regular Member of Dental Anthropology Association (DAA)
ii. Member of Young Scientists Network-Academy of Sciences Malaysia (YSN-ASM) from 30 September 2021 until 31 December 2024.
iii. Associate Member of *Majlis Profesor Negara (MPN)* Malaysia (MPN12576)
iv. Associate Member of *Akademi Profesor Malaysia (APM)* under the Ministry of Higher Education Malaysia (AMAPM023)
v. Member of the INTERPOL Disaster Victim Identification (DVI) Forensic Odontology Sub-Group
vi. Fellow of International College of Dentists (FICD)
vii. Fellow of Pierre Fauchard Academy (FPFA)
viii. Professional Member of The Forensic Science Society UK (MFSSoc)
ix. Member of International Association of Dental Research (IADR)
x. Ordinary Member of Malaysian Dental Association (MDA)
xi. Good Clinical Practice (GCP) certified on 18 March 2021

## *Research Interests & Competencies*

i. Dental and Skeletal Age Estimation - Forensic Human Identification via Teeth
ii. 3D Photogrammetry with 3dMDface digital photogrammetry
iii. Data Visualizations with RStudio and Phython
iv. Responsible Conduct in Research and Ethics [passed Malaysian Code of Responsible Conduct in Research (MCRCR) competency exam]

**Technical skills**

RStudio, MeVisLab, WinID3, Office Applications, Systematic Review and Meta-analysis

**Training**

- **Summer Bootcamp: Real-Life Implementation Science.** Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia. *3-5 August 2021*.

- **Research Ethics Webinar: Researching Ethically and Responsibly with Marginalized Communities (Refugees & Migrants).** Research Integrity & Ethics Unit, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia. *13 July 2021*.
- **Conflict Management & Managing High Performance Team.** Universiti Teknologi MARA. *29-30 October 2018*.
- **Systematic Review and Meta-Analysis in Dentistry.** International Medical University, Kuala Lumpur, Malaysia. *1 June 2018*.
- **Graphics in R (**18 hours). Hasselt University, Diepenbeek, Belgium. *27-29 May 2015*.
- **Big Data** (7 hours). Flanders Training Network for Methodology and Statistics (FLAMES), Ghent, Belgium. *13 May 2015.*
- **Applications of 2D and 3D Geometric Morphometrics in Forensic Comparisons**. Washington State Convention Center, Seattle, USA. *1 August 2014*.
- **Meta Analysis**. Leuven, Belgium. *14 February – 21 March 2014*.
- **Oral Pathology in Children**. Holiday Inn Hotel Diegem, Brussels, Belgium. *27 April 2013.*
- **Forensic Human Identification (DipFHID) Course 2013**, Charterhouse Square, Academy of Forensic Medical Sciences. London, UK. *18–22 March 2013.*
- **Course in Forensic Anthropology**. Leuven, Belgium. *25 April 2012.*
- **Seminar on Use of Cone Beam CT for Dentomaxillofacial Diagnostics**. Leuven Centre for Irish Studies (LCIS), Leuven, Belgium. *31 May – 1 June 2012.*

**Acquired Research Grants (Cumulative: RM1,177,450)**

*As Principal Investigator (PI)*

i. **Bio-ID-Pro** – Vice Chancellor Special Project (VCSP) Grant from Universiti Teknologi MARA, Malaysia (RM15,000) – 1 January 2024 – 31 December 2024 – University Research Grant (On-going)

ii. ***Classification of Proximal Dental Caries and Cervical Burnout in Digital Bitewings using Deep Convolutional Neural Network*** – DUCS-F Research Grant from Universiti Teknologi MARA, Malaysia (RM40,000) – 1 October 2022 – 31 September 2024 – University Research Grant (On-going)

iii. ***Validation of Novel Deep Convolutional Neural Network for Multiple Commingled Bite Marks Segmentation and Classification*** – MyRA Road to HiCOE Grant from Universiti Teknologi MARA, Malaysia (RM60,000) – 30 June 2022 – 29 June 2024 – University Research Grant (On-going)

iv. ***Modelling the Novel Automated Dental Dating for Age Assessment in Undocumented Refugees*** – DUCS-CoE Research Grant from Universiti Teknologi MARA, Malaysia (RM50,000) – 1 April 2022 – 31 March 2024 – University Research Grant (On-going)

v. ***Characterizing the Agglomerated Cementum Incremental Lines in Charred Teeth of Different Extreme Heat Exposures*** – Fundamental Research Grant Scheme (FRGS) from Ministry of Higher Education, Malaysia (RM99,500) – 1 October 2021- 30 September 2024 – National Research Grant (On-going)

vi. ***Cementochronological Characteristics of Agglomerated Incremental Lines in Charred Teeth for Disaster Victim Identification*** – Special Research Grant (GPK 2020) from Universiti Teknologi MARA, Malaysia (RM20,000) – 21 December 2020– 30 December 2022 – University Research Grant (On-going)

vii. ***Micro-Computed Tomographic Characterization of Translucent Dentinal Root in Different Age Scales of Aging Individuals*** – LESTARI Grant from Universiti Teknologi MARA, Malaysia (RM30,000) – 1 August 2019– 30 July 2022 – University Research Grant (On-going)

viii. ***Intraoral Digital Sensor Holder for Bisecting Angle Technique*** – Prototype Research Grant Scheme (PRGS) from Ministry of Higher Education, Malaysia (RM96,000) – 15 August 2017- 14 August 2019 – National Research Grant (Completed)

*As Co-Investigator*

i. **Exploring the Readiness and Acceptance of Augmented Reality In Dental Prostheses Care Education For Patients And The Impact On Oral Hygiene** - Fundamental Research Grant Scheme (FRGS) from Ministry of Higher Education, Malaysia (RM94,400) **–** 1 October 2023 - 30 September 2025 – National Research Grant (On-going)

ii. ***Development of a Fully Automated Classification System of Cervical Vertebral Maturation Staging Using Deep Convolutional Neural Network*** - Prototype Research Grant Scheme (PRGS) from Ministry of Higher Education, Malaysia (RM210,100) **–** 15 September 2023 - 15 September 2025 – National Research Grant (On-going)

iii. ***Deciphering the Topographic Characteristics of Root Dentinal Translucency (RDT) to Reverse Oral Frailty amongst Malaysian Aging Population*** - UCS Grant (DUCS 4.0) from Universiti Teknologi MARA, Malaysia (RM49,500) – 1 February 2022– 30 February 2024 – University Research Grant (On-going)

iv. ***In Silico Analysis of Mandibular Fracture Treated with Different Miniplates: A CBCT Study –*** SIRIM Berhad (RM5,400) – 22 October 2021 – 14 October 2022 – Industrial Funding (On-going)

v. ***Drone-Assisted Victim Localization and Identification in Mass-Disaster Management from a Forensic Perspective*** – Transdisciplinary Research Grant Scheme (TRGS) from Ministry of Higher Education, Malaysia (RM257,850) – 1 January 2019- 30 January 2022 – National Research Grant (On-going)

vi. ***Identifying New Hyperelastic Constitutive Model via Integration of Multiple Models in Medical Hybrid Biomaterials*** - Fundamental Research Grant Scheme (FRGS) from Ministry of Higher Education, Malaysia (RM109,700) – 1 August 2019- 30 July 2021 – National Research Grant (On-going)

vii. ***In-Depth Dento-Socio-Anthropology for Orang Asal Communities of Pahang & Perak Rainforest*** - Special Research Grant (GPK 2020) from Universiti Teknologi MARA, Malaysia (RM20,000) – 21 December 2020– 30 December 2022 – University Research Grant (On-going)

viii. ***Development of a Novel Dual Angle Dental X Ray Holder: A Prototype*** - LESTARI Grant from Universiti Teknologi MARA, Malaysia (RM20,000) – 21 December 2020 – 20 December 2022 – University Research Grant (On-going)

## *Teaching*

### Postgraduate Teaching

| YEAR/SEMESTER | NAME & COURSE CODE | LECTURE HOURS | STUDIO/LAB/OTHER HOURS | STUDENTS |
|---|---|---|---|---|
| 2019-2023/1 | Research Design and Biostatistics (DRD701)<br>- *Regulations, Procedures and Ethics in Research*<br>- *Finding the Literature – Systematic Literature Review*<br>- *Fundamental vs. Clinical Research*<br>- *Evidence-based Medicine* | 8 | | 22 |
| 2019-2023/4 | Multidisciplinary Health Sciences (DMH701)<br>- *Cone-beam Computed Tomography*<br>- *Advanced Medical Imaging* | 3 | 3 | 22 |
| 2019-2023/2 | Dental Public Health (DCH901)<br>- *Advanced Systematic Review*<br>- *Meta-Analysis*<br>- *Managing Disasters and Complex Humanitarian Emergencies* | 15 | 12 | 7 |

### Undergraduate Teaching

| YEAR/SEMESTER | NAME & COURSE CODE | LECTURE HOURS | STUDIO/LAB/OTHER HOURS | STUDENTS |
|---|---|---|---|---|
| 2016-2023/3/4/5 | Oral and Maxillofacial Diagnostic Imaging (DOM 503) | 35 | | 240 |
| 2016-2023/7 | Community Oral Health (DCH 503) | 2 | | 72 |
| 2016-2023/8 | Forensic Odontology (DOM 503) | 6 | | 72 |
| 2016-2017-2018-2019-2020-2021-2022-2023/3&4 | Oral and Maxillofacial Diagnostic Imaging (DOM 503) – Practical Sessions | | 51 | 80 |
| 2016-2017-2018-2019/5,6,7&8 | Comprehensive Care (DCC607) – Clinical Supervision | | 75 | 142 |

## *Research Supervisions*

### Postgraduate Supervision

| YEAR/ SEMESTER | DEGREE | CANDIDATE NAME | THESIS TITLE | STATUS |
|---|---|---|---|---|
| **As Main Supervisor** | | | | |
| 2023-2024/1 | PhD | Dr Noraina Hafizan Norman | Fully Automated Neural Network for Classification of Cervical Vertebral Maturation As a Biologic Indicator of Skeletal Maturity | On-going |

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|---|---|---|---|---|
| 2022-2024/1 | PhD | Muhammad Zaid Zainuddin | Micro-computed Tomographic Characterization of Translucent Dentinal Root in Different Age Scales of Aging Individuals | On-going |
| 2020-2024/1 | PhD | Dr Fairozekhan Arishiya Thapasum | Bone Age Estimation based on Trabecular Bone Microstrcuture Parameters Correlation and Quantification in Cone Beam CT | On-going |
| 2019-2024/1 | PhD | Dr Faraz Mohammed | Cementochronological Characteristics of Agglomerated Incremental Lines in Charred Teeth for Disaster Victim Identification | On-going |
| 2022-2023/1 | MScD | Dr Mohd Isyrafuddin Ismail | Classification of Proximal Dental Caries and Cervical Burnout in Digital Bitewings Among Medically Compromised Populations Using Deep Convolutional Neural Network | Successfully Completed |
| 2017-2019/1 | PhD | Norhasmira Mohammad | Automated Segmentation of Dental Development using Advance Computer Vision Algorithms and Models for Age Assessment | Successfully Completed |
| 2017-2019/3 | DClinDent Periodontology | Dr Nurul Ain Mohamed Yusof | Diagnostic Accuracy of Clinical, Periapical Radiograph and CBCT Measurement Techniques for Assessing Furcation Defects Prior to Periodontal Surgery | Successfully Completed |
| **As Co-supervisor** | | | | |
| 2023-2024/1 | Dr ForenOdont | Dr Nur Nabilah Zulkifly UKM | Analysis of the Maxillary Sinus using Radiographic Images: Its Role in Forensic Identification in the Adult Populations of Malaysia & Indonesia | On-going |
| 2023-2024/1 | Dr ForenOdont | Dr Mohama Asyraf Iskak UKM | Comparison of Radiological-Based Age Estimation with Laboratory-Based Age Estimation | On-going |
| 2021-2022/1 | Dr SCD | Dr Tun Yasmin Iffah Mohd Suria Affandi | Analysis of Patient's Health Profiles, Treatment Needs, Service Quality And Physical Accessibility Within Special Care Dentistry Services Of Teaching Hospitals In Malaysia - A Multicentre Study | On-going |
| 2021-2023/1 | MClinDent OMFS | Dr Wong Ling Vuan UM | Interpositional Biomaterial Athroplasty: A Systematic Review | On-going |
| 2020-2021/1 | PhD | Sharifah Mastura Syed Mohd Daud | Efficiency of Drone-Assisted Procedures in Difficult-To-Access Sites and Dangerous Conditions in DVI Compared to Conventional Procedures | On-going |
| 2018-2019/1 | DClinDent Periodontology | Dr Fara Azwin Adam UKM | Salvadora persica L. And Its applications in Dental Plaque Control and Overall Periodontal Health- A systematic review and Meta-analysis | Successfully Completed |
| 2018-2019/1 | DClinDent Prosthodontic | Dr Jumanah Magzoub Ali Babiker | Correlation and Predictive Modeling of Gingival Phenotype with Crown Forms and Its Underlying Alveolar Thickness | Successfully Completed |
| 2017-2019/3 | DClinDent Orthodontic | Dr Liyana Ghazali | Effects of Reducing Orthodontic Scanning Parameters on Image Quality and Nucleus Changes | Successfully Completed |
| 2016/5 | MSc | Norfariha Che Mohamed UKM | Equivalent Dose Measurement on Skin, Eyes and Thyroid Organs Using Phantom in Intraoral and Extraoral Radiographic Examination | Successfully Completed |

## Undergraduate Supervision

| YEAR/SEMESTER | CANDIDATE NAME | PROJECT TITLE | STATUS |
|---|---|---|---|
| 2016-2017/8 | Nur Liyana Abdul Rahman & Amiza Aqiela Ahmad Asri | Repeat analysis of intraoral digital imaging using complementary metal oxide semiconductor sensor ***- Published*** | Successfully Completed |
| 2016-2017/6 | Afaf Syahira Ahmad Satmi & Nurkamilya Halimah Fadhilah | Effectiveness and comfort assessment of the novel intraoral digital radiographic receptor devices ***- Published*** | Successfully Completed |
| 2015-2016 | Mohammad Zeyad Nabulsi & Afizuddin Othman (Bachelor of Dental Surgery, IIUM) | Accuracy of dental age assessment to determine chronological age ***- Published*** | Successfully Completed |

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|---|---|---|---|
| 2016-2017/6 | Nurfarrahhana Mohd Sapawi & Aziatul Akmal Rohazak | Vitamin D and dental caries: systematic review and meta-analysis | Successfully Completed |
| 2016-2017/6 | Mohammad Syafeq Ahmad & Nina Marianna Hazni | Architecture and amount of alveolar bone loss in patients with chronic periodontitis modified by dabetes mellitus | Successfully Completed |
| 2017-2018/6 | Siti Suhailah Sulaiman (Program Sarjana Muda Pengimejan Perubatan HS242, UiTM) | Evaluation of adaptive thresholding algorithm on vertical root fracture of CBCT images | Successfully Completed |
| 2017-2018/5 | Thanaletchumi A/P Manimala & Aznurul Athirah bt Zulkifli (Bachelor of Forensic Science (Hons), MSU) | Reliability of third molar development in forensic age estimation using Demirjian and Nolla's technique in a Malaysian Malay population ***- Published*** | Successfully Completed |
| 2017-2018/6 | Intan Syakirah Ramli & Ummi Solehah Muhd | Measuring grey value threshold of dentinal root translucency in Micro-CT for dental age estimation ***- Published*** | Successfully Completed |
| 1 September 2018 – 1 March 2019 | Kuck Peng Sim (Bachelor of Forensic Science (Hons), MSU) | Adaptation of Demirjian's Method for Age Estimation via Third Molar Development among Adolescents and Young Adults of Malay Ethnicity ***- Published*** | Successfully Completed |
| 2018-2019/6 | Ain Ashraf Rizwal & Nursyereen Azahar | Accuracy of Superimposed Polygonal Approximation Analysis on 2D Photographs and 3D Scanned Images in Experimental Bite Marks ***- Published*** | Successfully Completed |
| 2018-2019/6 | Sharifah Sakinah Syed Zain & Syasya Qistina Redzuan | Growth outcome prediction and it's correlated dental age among Cleft Lip and Palate children in Klang Valley | Successfully Completed |
| 2018-2019/6 | Nur Anis Abdul Razak & Nur Dalila Mohd Ramzi | Microtensile Bond Strength of Total-Etch and Self-Etch Universal Adhesives with 10-MDP: A Systematic Review | Successfully Completed |
| 2018-2019/6 | Nur Alyani Md Pisar & Nur Adlin Che Mohd Zain | Efficacy of Contrast Medium-Assisted Imaging in Diagnosing Cracked Tooth: A Preliminary Study ***- Published*** | Successfully Completed |
| 2021-2022/6 | Imran Hadi Mohamad Nidzam & Carmelia Richard Manih | Accuracy of Contemporary Dental Age Estimation Methods in Malay Children | Successfully Completed |
| 2022-2023/6 | Hasya Syahirah Hilmy & Syifa Syazwina Samsuni | Use of Multimedia Informed Consent in Improving Comprehension, Recall and Anxiety of Participants for Cone-beam CT Examination | Successfully Completed |
| 2023-2024/6 | Muhammad Imran Shauqi Zaini & Nurain Watiqah Ahmad Kamal | Facial Soft Tissue Thickness For Forensic Craniofacial Reconstruction In Malay Population Using Cone-Beam CT | On-going |

## *Publications*

### Articles in Academic Journals and Academic Books

2024

1. A.F. Ismail, N.H. Adnan, N.N.S. Suhaidi, I.W.M. Mokhtar, **M.Y.P.M. Yusof**, M.S. Kumar. *Accuracy of Different Dental Age Assessment Methods to Determine Chronological Age among Children with Special Needs.* **Journal of Indian Society of Pedodontics and Preventive Dentistry**. 2024, 42(1), pp. 64-70. DOI.10.4103/jisppd.jisppd_47_24. ***(SCOPUS-indexed)***.

2. A. Kurniawan, A. Alias, **M.Y.P.M. Yusof**, A. Marya. *Optimization of forensic identification through 3-dimensional imaging analysis of labial tooth surface using open-source software.* **Imaging Science in Dentistry**. 2024, 54(1), pp. 63-369. DOI.10.5624/isd.20230218. ***(WoS/SCOPUS-indexed).***

3. S.M.S.M. Daud, C.C. Heo, **M.Y.P.M. Yusof**, L.S. Khoo, M.K.C. Singh, M.S. Mahmood, M.D.M. Nasir, H. Nawawi. *Use of Thermal Drone in Detection and Assessment of Larval*

*Mass Temperature in Decomposed Rabbit Carcasses*. **Journal of Forensic Sciences**. 2024, 69 (2), pp. 542 - 553. DOI: 10.1111/1556-4029.15466. ***(Q2 WoS/SCOPUS-indexed)***.

4. A. Azizan, A. Azmi, **M.Y.P.M. Yusof**. *Bibliometric Analysis on Geriatric Rehabilitation in Scopus Database (1948-2022).* **Topics in Geriatric Rehabilitation**. 2024, 40(1), pp. 60–68. DOI.10.1097/TGR.0000000000000423. ***(WoS/SCOPUS-indexed).***

5. A. Kurniawan, J. Hamdani, A. Chusida, H. Utomo, B.N. Rizky, B.F.W.R. Prakoeswa, A.R. Yuniar, R. Salazar-Gamarra, A. Alias, **M.Y.P.M. Yusof**, A. Marya. *Exploring the Feasibility of Smartphone Cameras for 3D Modelling of Bite Patterns in Forensic Dental Identification.* **Legal Medicine**. 2024, 67, 102399. DOI.org/10.1016/j.legalmed.2024.102399. ***(Q2 WoS/SCOPUS-indexed)***.

6. S.H. Azhar-Hilmy, N. Nordin, **M.Y.P.M. Yusof**, T.Y.T. Soh, N. Yusof. *Components in Downstream Health Promotions to Reduce Sugar Intake Among Adults: A Systematic Review.* **Nutrition Journal**. 2024, 23(1), 11. DO.10.1186/s12937-023-00884-3. ***(Q2 WoS/SCOPUS-indexed)***.

2023

1. N.A.M. Pisar, N.A.C.M. Zain, N.M. Zohdi, **M.Y.P.M. Yusof**, H. Ishak. *Efficacy of Contrast Medium-assisted Imaging in Diagnosing Cracked Tooth.* **Malaysian Journal of Medicine and Health Sciences.** 2023, 19, pp. 46–51. DOI.10.47836/mjmhs.19.s18.7. ***(SCOPUS-indexed)***.

2. M.F.M. Hanim, N. Shariff, I.E. Mohammed, **M.Y.P.M. Yusof**, B.A.M. Sabri, N. Yusof. *Factors Affecting the Psychological Health of Dental Care Professionals During Pandemic: A Systematic Review.* **Malaysian Journal of Medicine and Health Sciences**. 2023, 19, pp. 83–98. DOI.10.47836/mjmhs.19.s18.12. ***(SCOPUS-indexed)***.

3. N.E. Mohd Sabri, M.K. Chainchel Singh, M.S. Mahmood, L.S. Khoo, **M.Y.P.M. Yusof**, C.C. Heo, M.D.M. Nasir, H. Nawawi. *A Scoping Review on Drone Technology Applications in Forensic Science*. **SN Applied Sciences**. 2023, 5(9):233. DOI.org/10.1007/s42452-023-05450-4. ***(Q2 WoS/SCOPUS-indexed)***.

4. M.Z. Zainuddin, N.S. Mohamad, S.K. Tan, **M.Y.P.M. Yusof.** *The Applications of X-Ray Micro-Computed Tomography (μCT) in Studying Age Related Tooth Morphological Changes: A Scoping Review.* **Journal of Forensic Sciences**. 2023, 68(6), pp. 2048–2056. DOI.org/10.1111/1556-4029.15352. ***(Q2 WoS/SCOPUS-indexed)***.

5. F.A. Adam, N. Mohd, H. Rani, **M.Y.P.M. Yusof**, B. Baharin. *Salvadora persica L.: An effective anti-plaque and anti-gingivitis toothpaste: A systematic review & meta-analysis of randomized control clinical trials.* **Journal of Herbal Medicine**. 2023, 40(100677). DOI.org/ 10.1016/j.hermed.2023.100677. ***(Q1 WoS/SCOPUS-indexed)***.

6. N.H.K Affendi, J. Babiker, **M.Y.P.M. Yusof.** *CBCT Assessment of Alveolar Bone Wall Morphology And Its Correlation with Tooth Angulation in The Anterior Mandible: A New Classification for Immediate Implant Placement***. Journal of Periodontal & Implant**

**Science**. 2023, 53(2):e9, pp. 1-14. DOI.org/10.5051/jpis.2105000250. ***(Q2 WoS/ SCOPUS-indexed)***.

7. Kurniawan, A., Chusida, A., Utomo, H., Marini, M. I., Rizky, B. N., Prakoeswa, B. F. W., Hamdani, J., Salazar-Gamarra, R., Dib, L.L., Alias, A., **M.Y.P.M. Yusof**, Marya, A. *3D Bitemark Analysis in Forensic Odontology Utilizing A Smartphone Camera And Open-Source Monoscopic Photogrammetry Surface Scanning.* **Pesquisa Brasileira Em Odontopediatria e Clinica Integrada.** 2023, 23(e220087). DOI.org/10.1590/pboci.2023.001. ***(SCOPUS-indexed)***.

8. N. Angelakopoulos, S. De Luca, I. Oliveira-Santos, I.L.A Ribeiro, I. Bianchi, S. Balla, H.C. Kis, L.G. Jiménez, G. Zolotenkova, **M.Y.P.M. Yusof**, A. Selmanagić, H. Pandey, C.P. Pereira, J.B.M. da Nóbrega, H. Kalani, S.M. Mieke, A. Kumagai, A. Gulsahi, K. Zelić, N. Marinković, J. Kelmendi, I. Galić, I.S. Vázquez, E. Spinas, V. Montes, Y. Wendy, M. Moukarzel, J.P. Toledo, A.A. El-Bakary, R. Cameriere. *Third Molar Maturity Index ($I_{3M}$) Assessment According to Diferent Geographical Zones: A Large Multi-Ethnic Study Sample*. **International Journal of Legal Medicine.** 2023, 137(2), pp. 403–425. DOI.org/10.1007/s00414-022-02930-x. ***(Q1 WoS/ SCOPUS-indexed)***.

9. X. Tan, R.F. Obaid, G.F. Smaisim, M.H.M. Esfahani, F. Alsaikhan, S. Baghaei, S.K. Hadrawi, **M.Y.P.M. Yusof**, A. Yadav. *Investigation of addition of calcium phosphate ceramic to multilayer scaffold for bone applications with improved mechanical properties: Fuzzy logic analysis.* **Ceramics International.** 2023, 49(5), pp. 8339–8349. DOI.org/10.1016/j.ceramint.2022.10.366. ***(Q1 WoS/SCOPUS-indexed)***.

10. F.A. Adam, N. Mohd, H. Rani, **M.Y.P.M. Yusof**, B. Baharin. *A systematic review and meta-analysis on the comparative effectiveness of Salvadora persica - extract mouthwash with chlorhexidine gluconate in periodontal health.* **Journal of Ethnopharmacology**. 2023, 302(115863). DOI.org/10.1016/j.jep.2022.115863. ***(Q1 WoS/SCOPUS-indexed)***.

*11.* Y. Gao, A.J. Moshayedi, E. Sanatizadeh, P. Behfarnia, M. Karimzadeh Kolamroudi, D.T. Semirumi, **M.Y.P.M. Yusof**. *Analysis of amorphous structure with polycaprolactone-hydroxyapatite nanoparticles fabricated by 3D bioprinter technique for bone tissue engineering.* **Ceramics International.** 2023, 49(10), pp. 16053–16060. DOI.org/10.1016/j.ceramint.2023.01.203. ***(Q1 WoS/SCOPUS-indexed)***.

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1. N. Mohammad, R. Ahmad, A. Kurniawan, **M.Y.P.M. Yusof.** *Applications of Contemporary Artificial Intelligence Technology in Forensic Odontology as Primary Foresic Identifier: A Scoping Review.* **Frontiers in Artificial Intelligence**. 2022 December. 5 DOI:10.3389/frai.2022.1049584. ***(SCOPUS-indexed)***.

2. N.H.K Affendi, J. Babiker, **M.Y.P.M. Yusof.** *A Narrative Review of Alveolar Bone Analysis and CBCT Classification related to Immediate Implant Placement in The Anterior Maxilla*. **Malaysian Journal of Medicine and Health Sciences**. 18(6): 311-323. DOI.org/10.47836/mjmhs18.6.40. ***(SCOPUS-indexed)***.

3. D.S. Anwar, B.A.M. Sabri, **M.Y.P.M. Yusof**, M.S. Ahmad. *Family Influences in the Dental Caries Status of Children with Special Needs: A Systematic Review*. **Children**. 2022, 9(12), 1855. DOI.org/10.3390/children9121855. ***(Q2 WoS/SCOPUS-indexed)***.

4. A. Chowdhry, P. Kapoor, G.M. Fonseca, **M.Y.P.M. Yusof**, I. Bedek, H.T. Baig, C. Capitaneanu, E. Nuzzolese. *Under the Lens: A Report on Global Dental Morphology Modules*. **International Journal of Morphology.** 40(6):1497-1503, 2022. DOI.org/ 10.4067/S0717-95022022000601497. ***(SCOPUS-indexed)***.

5. **M.Y.P.M. Yusof**, C.H. Teo, C.J. Ng. *Electronic informed consent criteria for research ethics review: a scoping review.* **BMC Medical Ethics**. 23,117 (2022). DOI.org/10.1186/s12910-022-00849-x. ***(Q1 WoS/SCOPUS-indexed)***.

6. T.Y.T. Soh, N.M.M.N.M. Rosdy, **M.Y.P.M. Yusof**, S.H.A. Hilmy, B.A.M. Sabri. *Adoption of a Digital Patient Health Passport as Part of a Primary Healthcare Service Delivery: Systematic Review*. **Journal of Personalized Medicine**. 11(10):1521 (2022). DOI.org/10.3390/jpm12111814. ***(Q2 WoS/SCOPUS-indexed)***.

7. A. Tabassum, M.K Chainchel Singh, N. Ibrahim, S. Ramanarayanan, **M.Y.P.M. Yusof**. *Quantifications of Mandibular Trabecular Bone Microstructure Using Cone Beam Computed Tomography for Age Estimation: A Preliminary Study*. **Biology**. 2022; 11(10):1521. DOI.org/10.3390/biology11101521. ***(Q1 WoS/SCOPUS-indexed)***.

8. R. Zulkapli, **M.Y.P.M. Yusof**, S. Abd Muid, S.M. Wang, A.Y. Firus Khan, H. Nawawi. *A Systematic Review on Attenuation of PCSK9 in Relation to Atherogenesis Biomarkers Associated with Natural Products or Plant Bioactive Compounds in In Vitro Studies: A Critique on the Quality and Imprecision of Studies*. **International Journal of Environmental Research and Public Health.** 2022; 19(19):12878. DOI.org/10.3390/ijerph191912878. ***(Q1 WoS/SCOPUS-indexed)***.

9. N. Mohammad, A.M. Muad, R. Ahmad, **M.Y.P.M. Yusof.** *Accuracy of Advanced Deep Learning with TensorFlow and Keras for Classifying Teeth Developmental Stages in Digital Panoramic Imaging.* **BMC Medical Imaging**. April 2022:22;66. DOI:10.1186/s12880-022-00794-6. ***(Q3 WoS/SCOPUS-indexed)***.

10. Y. Shoji, **M.Y.P.M. Yusof**, R.I. Idris, S. Mitrirattanakul. *Bite Force of Patients with Tooth Pain.* **Clinical and Experimental Dental Research**. July 2022. DOI: org/10.1002/cre2.565. ***(WoS ESCI/SCOPUS-indexed)***.

11. Huixing Liang, S. Niazi Angili, M. Morovvati, Xiang Li, S. Saber-Samandari, **M.Y.P.M. Yusof**, A. Khandan, D. Toghraie. *Fabrication and characterization of wollastonite-titanium porous scaffold for pharmaceutical application: Representative volume element simulation.* **Materials Science & Engineering B**. June 2022:280;115684. DOI: 10.1016/j.mseb.2022.115684. ***(Q2 WoS/ SCOPUS-indexed)***.

12. M.M. Rad, S. SaberSamandari, D.O. Bokov, W. Suksatan, M.M. Aghdam, M.H.M. Esfahani, M. Sadighia, **M.Y.P.M. Yusof**, A. El-Shafay. *Fabrication of elastin additive on polymethyl methacrylate and hydroxyapatite-based bioactive bone cement*. **Materials Chemistry and Physics.** January 2022 280:125783. DOI:org/10.1016/j.matchemphys.2022.125783. ***(Q2 WoS/ SCOPUS-indexed)***.

13. H. Liang, S. Saber-Samandari, **M.Y.P.M. Yusof**, M.H.M. Esfahani, M. Shahgholi, M. Hekmatifar, R. Sabetvand, A. Khandan, D. Toghraie. *Investigation of the effect of Berkovich and Cube Corner indentations on the mechanical behavior of fused silica using molecular dynamics and finite element simulation.* **Ceramics International.** 48(19): January 2022 28781-28789. DOI:https:org/10.1016/j.ceramint.2021.12.201. ***(Q1 WoS/ SCOPUS-indexed)***.

14. S.M.S.M. Daud, **M.Y.P.M. Yusof**, C.C. Heo, L.S. Khoo, M.K.C. Singh, M.S. Mahmood, H. Nawawi. *Applications of Drone in Disaster Management: A Scoping Review*. **Science and Justice**. 2022 Jan: 6(1);30-42. DOI:org/10.1016/j.scijus.2021.11.002 ***(Q2 WoS/ SCOPUS-indexed)***.

2021

1. N**.** Baneshi**,** B.K**.** Moghadas**,** A**.** Adetunla**, M.Y.P.M. Yusof,** M**.** Dehghani**,** A**.** Khandan**,** S**.** Saber-Samandari**,** D**.** Toghraie**.** *Investigation the mechanical properties of a novel 3D multicomponent scaffold coated with a new bio-nanocomposite for bone tissue engineering: Fabrication, simulation and characterization.* **Journal of Materials Research and Technology.** December 2021:15;5526-5539. DOI:org/10.1016/j.jmrt.2021.10.107 ***(Q1 WoS/ SCOPUS-indexed)***.

2. V. Raj, N.S. Zulkiflee, **M.Y.P.M. Yusof,** T.N.M. Dom, A.R. Saini. *Health Economic Impact of COVID-19 among Private Dental Practitioners in Malaysia*. **Teikyo Medical Journal**. 2021 Dec 44:06;2315-2323. ***(SCOPUS-indexed)***.

3. J. Babiker, N.H.K. Affendi, **M.Y.P.M. Yusof,** S.J. Chu. *Qualitative and Quantitative Assessments of Alveolar Bone Dimension and Its Correlation with Tooth Angulation in the Anterior Maxilla for Immediate Implant Placement*. **Journal of Contemporary Dental Practice**. 2021 Nov 22(11):1237–1242. DOI:org/10.5005/jp-journals-10024-3211 ***(SCOPUS-indexed)***.

4. A.A. Rizwal, N. Azahar, N.H. Reduwan, **M.Y.P.M. Yusof**. *Superimposed Polygonal Approximation Analysis Comparing 2D Photography and 3D Scanned Images of Bite Marks on Human Skin.* **Egyptian Journal of Forensic Sciences**. 2021 Aug 11:18. DOI:org/10.1186/s41935-021-00233-7 ***(WoS ESCI/SCOPUS-indexed).***

5. N. Angelakopoulos, I. Galić, S. Balla, H.C. Kis, L.G. Jiménez, G. Zolotenkova, **M.Y.P.M. Yusof**, A. Selmanagić, H. Pandey, C.P. Pereira, J.B.M. Nóbrega, H. Kalani, S.M. Mieke, A. Kumagai, A. Gulsahi, K. Zelić, N. Marinković, J. Kelmendi, I. Bianchi, I.S. Vázquez, V. Montes, Y. Wendy, E. Spinas, I. Oliveira-Santos, S. De Luca, M. Moukarzel, R. Cameriere. *Comparison of the Third Molar Maturity Index ($I_{3M}$) between left and right lower third molars to assess the age of majority: a multi-ethnic study sample*. **International Journal of Legal Medicine.** 2021 July: 135;2423-2436. DOI:org/10.1007/s00414-021-02656-2 ***(Q1 WoS/ SCOPUS-indexed)***.

6. I.S. Ramli, U.S. Muhd, **M.Y.P.M. Yusof**. *Accuracy of Kvaal's Radiographic and Translucent Dentinal Root Techniques of Extracted Teeth in Malay Adults for Dental Age Estimation.* **Journal of Forensic Odonto-Stomatology.** 2021 Aug 30;2(39):38-44 ***(SCOPUS-indexed)***.

7. I.W. Mokhtar, A. Venkiteswaran, **M.Y.P.M. Yusof**. *Detection of occlusal caries in permanent teeth of children and young adolescents using sensitivity and specificity of near infrared light transillumination and bitewing radiography.* **Archives of Orofacial Sciences**. 2021 Dec 16(2):113-126 ***(WoS ESCI/SCOPUS-indexed)***.

8. L. Ghazali, **M.Y.P.M. Yusof**, N.H. Norman. *Image Quality Optimization of Dental Panoramic Tomogram and Lateral Cephalogram: A Pilot Study on Human Skull*. **Compendium of Oral Science**. 2021 June: 8(5);43-54 ***(Non-WoS/ SCOPUS-indexed).***

9. N. Mohammad, R. Ahmad, A.M. Muad, **M.Y.P.M. Yusof**. *Reclassification of Demirjian's Mandibular Premolars Staging for Age Estimation based on Semi-Automated Segmentation of Deep Convolutional Neural Network.* **Forensic Imaging.** 2021 March: 24:200440 DOI:org/10.1016/j.fri.2021.200440 ***(SCOPUS-indexed)***.

10. F.A. Adam, H. Rani, B. Baharin, **M.Y.P.M. Yusof**, N. Mohd. *Salvadora Persica Chewing Sticks and Standard Toothbrush as Anti-Plaque and Antigingivitis Tool: A Systematic Review and Meta-analysis.* **Journal of Ethnopharmacology**. 2021 June: 274(28):113882. DOI: org/10.1016/j.jep.2021.113882 ***(Q1 WoS/ SCOPUS-indexed)***.

11. L.S. Khoo, **M.Y.P.M. Yusof**, M.K.C. Singh, N.M. Tahir, A.A. Muhamat, M.S. Mahmood, H.M. Nawawi. (2021). **Disaster Victim Identification (DVI) Malaysia The MH17 Tragedy: The Untold Story**. In M.S. Mahmood (Ed.), *Emerging Issues and DVI Research in Malaysia* (pp. 160-179). UiTM Press. ISBN: 978-967-363-758-4 (Research Chapter in a Book).

2020

1. L. Ghazali, **M.Y.P.M. Yusof**, N.H. Norman. *Effects of Scanning Parameters Reduction in Dental Radiographs on Image Quality and Diagnostic Performance: A Randomised Controlled Trial.* **Journal of Orthodontics.** 2020 March: 48(1):1-8. DOI:10.1177/1465312520971641 ***(SCOPUS-indexed)***.

2. N.A.M. Yusof, E. Noor, N.H. Reduwan, **M.Y.P.M. Yusof**. *Diagnostic Accuracy of Periapical Radiograph, Cone Beam Computed Tomography, and Intrasurgical Linear Measurement Techniques for Assessing Furcation Defects: A Longitudinal Randomised Controlled Trial*. **Clinical Oral Investigations**. 2020 March: 25(3):923-932. DOI:10.1007/s00784-020-03380-8 ***(Q1 WoS/ SCOPUS-indexed)***.

3. A.S.A. Satmi. N.H. Fadhilah. **M.Y.P.M. Yusof**. *Effectiveness and Comfort Assessment of the Novel Intra-oral Bisecting Angle Bisector© and Paralleling RINN® Digital Imaging Receptor Holders in Low Palatal Height Patients*. **Archives of Orofacial Sciences**. 2020 June: 15(1):1-10. DOI:10.21315/aos2020.15.1.401 ***(SCOPUS-indexed)***.

4. N. Mohammad, **M.Y.P.M. Yusof**, A.M. Muad. *Region-based Segmentation and Classification of Mandibular First Molar Tooth Based on Demirjian's Method*. **Journal of Physics: Conference Series**. 2020 June: 1502(2020)012046:1-8. DOI:10.1088/1742-6596/ 1502/1/012046 ***(SCOPUS-indexed)***.

5. M.H.A. Adnan, N.F.A. Manan, N.N.M. Nazali, **M.Y.P.M. Yusof**. *Design and Improvement on Oral Radiography Desktop*. **Journal of Mechanical Engineering**. 2020 July: SI9(1):151-165 ***(SCOPUS-indexed)***.

6. **M.Y.P.M. Yusof**, M.C. Mah, N.H. Reduwan, K. Kretapirom, N.H.K. Affendi. *Quantitative and Qualitative Assessments of Intraosseous Neurovascular Canals in Dentate and Posteriorly Edentulous Individuals in Lateral Maxillary Sinus Wall*. **Saudi Dental Journal**. 2020 December: 32(8):396-402. DOI: 10.1016/j.sdentj.2019.10.010 ***(SCOPUS-indexed)***.

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8. E.T.L. Yin, K.P. Sim, **M.Y.P.M. Yusof**. *Adaptation of Demirjian's Method for Age Estimation via Third Molar Development Among Adolescents and Young Adults of Malay Ethnicity: A Preliminary Assessment*. **Malaysian Journal of Medicine and Health Sciences**. 2020 January: 16(SUPP1): 14-18 ***(SCOPUS-indexed)***.

2019

1. N.A.M. Yusof, E. Noor, **M.Y.P.M. Yusof**. *The accuracy of linear measurements in cone beam computed tomography for assessing intrabony and furcation defects: A systematic review and meta-analysis*. **Journal of Oral Research**. 2019 December: 8(6):527-539. DOI:10.17126/joralres.2019.077 *(**SCOPUS-indexed**).*

2. R. Ahmad, N.F. Affandi, N.A.F.M. Ayub, N.A. Mustafa, **M.Y.P.M. Yusof**, T.N.M. Dom. *The Value of Panoramic Radiograph as a Screening Tool Prior to Complete Denture Construction: A Restrospective Study.* **Journal of Dentistry Indonesia.** 2019 August: 26(2):65-69. DOI: 10.14693/jdi.v2621.1284 *(**SCOPUS-indexed**).*

3. M.S. Zamasry, **M.Y.P.M. Yusof**, H.S.A. Razali, H.M. Nawawi, M.S. Mahmood. *Sudden Death Due to Infective Endocarditis Caused by Streptococcus Constellatus: A Case Report*. **Tropical Biomedicine**. 2019 July: 36(4);1-5 *(**SCOPUS-indexed**).*

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2018

1. N.A.K. Nik Dziauddin, N.A Adull Manan, **M.Y.P.M. Yusof**, J. Mahmud, S. A. Abdullah. *Multiple angle of Bisector Rinn Holder for oral X-ray.* **International Journal of Engineering & Technology**. 2018 Nov: 7 (4.26):215-220. DOI: 10.14419/ijet.v7i4.26.22170 *(**SCOPUS-indexed**).*

2. K.L. Chng, **M.Y.P.M. Yusof**, A.H. Hasmi, M.S. Mahmood. *Death of two military pilots in Hawk-108 fighter jet crash*. **Journal of Forensic Science and Medicine**. 2018 Jun;4:101-3. DOI:10.4103/jfsm.jfsm_91_17 *(**SCOPUS-indexed**).*

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2017

1. N. Che Mohamed, H.Nawawi, **M.Y.P.M. Yusof**, K.S. Khoo. *Equivalent dose measurements from digital intra- and extra-oral imaging examinations.* **Pertanika Journal of Science and Technology.** 2017 Jul;25(S):251-262 ***(SCOPUS-indexed)***.

2. **M.Y.P.M. Yusof**, N.L. Abdul Rahman, A.A. Ahmad Asri, N.I. Othman, I. Wan Mokhtar. *Repeat analysis of intraoral digital imaging performed by undergraduate students using a complementary metal oxide semiconductor sensor: An institutional case study.* **Imaging Science in Dentistry**. 2017 Dec;47(4):233-239. DOI:10.5624/isd.2017.47.4.233 ***(WoS/SCOPUS-indexed)***.

4. **M.Y.P.M. Yusof,** I. Wan Mokhtar, S. Rajasekharan, R. Overholser, L. Martens. *Performance of Willem's dental age estimation method in children: A systematic review and meta-analysis*. **Forensic Science International**. 2017 Nov;280:245.e1-245.e10. DOI:10.1016/j.forsciint.2017.08.032 DOI:10.5624/isd.2017.47.4.233 ***(Q2WoS/SCOPUS-indexed)***.

5. **M.Y.P.M. Yusof.** *Assessment of different prediction models utilizing two predictors for dental age estimation*. **Forensic Science International**. 2017 Aug;277(S1):76-77. DOI:10.1016/j.forsciint.2017.07.019 ***(Q2WoS/SCOPUS-indexed)***.

6. L. Martens, S. De Smet, **M.Y.P.M. Yusof**, S. Rajasekharan. *Association between overweight/obesity and periodontal disease in children and adolescents: a systematic review and meta-analysis.* **European Archives of Paediatric Dentistry**. 2017 Apr;18(2):69-82. DOI:10.1007/s40368-017-0272-1 DOI:10.5624/isd.2017.47.4.233 ***(WoS/SCOPUS-indexed)***.

*7.* N.S. Syairah, N.M.S. Rawaidah, G.R.A. Froemming, I.M. Amin, **M .Y.P.M. Yusof,** G.H. Khor. *IC50 of Ganoderma Lucidum Extract on Oral Cancer Cells ORL-48T.* **Journal of Fundamental and Applied Sciences**. 2017 Nov;9(6S):237-245. DOI:10.4314/jfas.v9i6s.19 DOI:10.5624/isd.2017.47.4.233 ***(SCOPUS-indexed)***.

8. G. H. Khor, N. A. Khoruddin, N. R. M. Shobri, , S. N. Suhaimi, T. T. Hock, **M.Y.P.M. Yusof**,. *A review of Ribonucleotide Reductase and Cancer Therapies*. **Journal of International Dental and Medical Research**. 2017 Dec;10(3):1032-1037 ***(SCOPUS-indexed).***

9. G. H. Khor, N. R. M. Shobri, N. A. Khoruddin, S. N. Suhaimi, **M.Y.P.M. Yusof**, T. T. Hock. *A Review on Di Methyl Thiazoldiphenyl-Tetrazoliumbromide (MTT) Assay in Cell Viability*. **Research Journal of Applied Sciences**. 2017 Dec;12(7):372-378 ***(SCOPUS-indexed).***

2016

1. **M.Y.P. M. Yusof**. Analysis of Dental Age Estimation Models: An Ethnic-specific Study, Lambert Academic Publishing, 2016. ISBN 978-3-659-88978-3 ***(Academic Book).***

2. **M.Y.P. M. Yusof**. Contemporary Dental Age Estimation Models in Children and Sub-adults, University Press, Ghent University, 2016. ISBN 978-909-0295-81-7 ***(Academic Book).***

2015

1. **M.Y.P.M. Yusof.** *Digitalized bite mark analysis for the undergraduate dental students*. **Compendium of Oral Science**. 2015 Dec; 2(1):1-5 ***(Non-WoS/SCOPUS-indexed).***

2. **M.Y.P.M. Yusof**, R. Cauwels, L. Martens. *Stages in third molar development and eruption to estimate the 18-year threshold Malay juvenile*. **Archives of Oral Biology**. 2015 Oct;60(10):1571-1576. DOI 10.1016/j.archoralbio.2015.07.017 ***(Q2WoS/SCOPUS-indexed).***

3. **M.Y.P.M. Yusof**, R. Cauwels, E. Deschepper, L. Martens. *Application of third molar development and eruption models in estimating dental age in Malay sub-adults.* **Journal of Forensic and Legal Medicine**. 2015 May;32:40-44. DOI 10.1016/j.jflm.2015.05.004 ***(WoS/SCOPUS-indexed).***

2014

1. **M.Y.P.M. Yusof**, P.W. Thevissen, S. Fieuws, G. Willems. *Dental age estimation in Malay children based on all permanent teeth types*. **International Journal of Legal Medicine**. 2014 Mar;128(2):329-33. DOI 10.1007/s00414-013-0825-8 ***(Q1WoS/SCOPUS-indexed).***

2011

1. Abdul Aziz, N.H. Abu Kasim, C. Ramasindarum, **M.Y.P. M. Yusof**, M. Paiizi, R. Ahmad. *Wear of rotary instruments: A pilot study.* **Annal of Dentistry University of Malaya** 2011; 18: 1–7 ***(Non-WoS/SCOPUS-indexed).***

**Other Publications in Newspaper/Newsletter**

1. **M.Y.P.M. Yusof,** A. Azizan. Perkaitan Antara Penyakit Periodontal dengan Obesiti. KOSMIK. Jilid 32, Bil 02/2024/1445H KK600-91032-0224. ISSN 0128-6579 (https://jendeladbp.my/ujana/dewan-kosmik-februari-2024/?fbclid=IwAR08r28NLGZlS4pvAJixSiuiPtedtH5xt1iUOXR03zuI1JcB6T3NLlmvBXg)

2. **M.Y.P.M. Yusof.** Disaster Victim Identification Using Teeth Can Help Find Closure. New Straits Time. 22 August 2023 (https://www.nst.com.my/opinion/columnists/2023/08/946161/disaster-victim-identification-using-teeth-can-help-find-closure)

3. **M.Y.P.M. Yusof.** *Runaway Patient: How Much Material Risks to Disclose in Informed Consent?* MDA News Jan – Mar 2023 (https://web.mda.org.my/wp-content/uploads/2023/04/MDA-Jan-March-2023.pdf)

4. **M.Y.P.M. Yusof.** *Dron Infra Merah Bantu Selamat Mangsa Bencana*. Berita Harian. 14 Januari 2022 (http://perpustakaanjbpm.blogspot.com/2022/01/dron-infra-merah-bantu-selamat-mangsa.html)

5. **M.Y.P.M. Yusof.** *Bite Mark Recognition in Child Abuse: A Practitioner Guide*. MDA News Jul – Sep 2016 (https://web.mda.org.my/wp-content/uploads/2021/11/2016-07-Jul-Sep.pdf)

**Proceedings & Presentations**

2023

1. **M.Y.P. M. Yusof**, C.H. Teo, C.J. Ng. ***Electronic Informed Consent Criteria for Research Ethics Review: A Scoping Review.*** 23rd FERCAP International Conference. Universiti Malaya, Kuala Lumpur, Malaysia. 27-28 November 2023. Proceeding No. 4A. Oral Presentation.

2. **M.Y.P. M. Yusof.** ***Development and Validation of Automated Forensic Dental Age Estimation Lab (F-DentEst Lab).*** 23rd Triennial Meeting of the International Association of Forensic Sciences. International Convention Centre Sydney, Australia. 20-24 November 2023. Proceeding No. 35. Oral Presentation.

3. M.Z. Zainuddin, S.K. Tan, N.S. Mohamad, **M.Y.P. M. Yusof**. ***The Applications of X-Ray Microtomography (Micro-CT) in Studying Age-Related Tooth Morphological Changes: A Scoping Review***. 75th Annual Scientific Meeting of the American Academy of Forensic Sciences (AAFS). Orlando, Florida, United States of America. 13-18 February 2023. Proceeding No. H14. Oral Presentation (Extended Abstract).

2022

1. **M.Y.P.M. Yusof,** A.T. Fairozekhan, N. Ibrahim, M.S.K.C. Singh. ***Quantification of Mandibular Trabecular Bone Microstructure using Cone Beam Computed Tomography for Age Estimation in Disaster Victim Identification.*** 31st INTERPOL Disaster Victim Identification Conference. 21-23 June 2022. Oral Presentation.

2021

1. N. Mohammad, **M.Y.P.M. Yusof**, R. Ahmad, A.M. Muad. ***Validation of Deep Neural Network for Age Estimation in Malay Children using Digital Panoramic Dental Imaging.*** 20th Annual Scientific Meeting of International Association of Dental Research (IADR) Malaysian Section Virtual Conference. 18 September 2021. Presentation ID: PG52. Oral Presentation.

2. A.T. Fairozekhan, **M.Y.P.M. Yusof**, N. Ibrahim, M.S.K.C. Singh. ***Chronological Age Estimation based on Trabecular Bone Microstructure Parameters of Mandible using Cone Beam Computed Tomography.*** 20th Annual Scientific Meeting of International Association of Dental Research (IADR) Malaysian Section Virtual Conference. 18 September 2021. Presentation ID: PG47. Oral Presentation.

3. N.Ismail, I.W.Mokhtar, **M.Y.P.M. Yusof**. ***Accuracy of Dental Age Estimation Methods in Children with The Chromosomal Syndrome: A Systematic Review and Meta-Analysis.***

20th Annual Scientific Meeting of International Association of Dental Research (IADR) Malaysian Section Virtual Conference. 18 September 2021. Presentation ID: PG51. Oral Presentation.

2020

1. **M.Y.P.M. Yusof**, M.C. Mah, N.H. Reduwan, K. Kretapirom, N.H.K. Affendi. ***Assessments of Intraosseous Neurovascular Canals in Lateral Maxillary Sinus Wall***. 99th General Session and Exhibition of the International Association of Dental Research (IADR). Washington DC, United States of America. 18-21 March 2020. Presentation ID: 2796. Oral Presentation (Session Chair for Oral Session Diagnostic Sciences I).

2019

1. **M.Y.P.M. Yusof,** A.S. Ahmad Satmi, N.H. Fadilah**.** ***Assessment of Novel Intraoral Bisecting Angle Digital Imaging Receptor Holders***. 97th General Session and Exhibition of the International Association of Dental Research (IADR). Vancouver Convention Center, Vancouver, Canada. 19-22 June 2019. No. 1973 Poster presentation.

2018

1. **M.Y.P.M. Yusof.** ***Mapping the Graduate Research Training Trends of the Forensic Odontologist in Malaysia***. 3rd Indonesian International Symposium of Forensic Odontology (INASFO). Ciputra Hotel, Jakarta, Indonesia. 24-25 March 2018. Proceeding No. 2415 Poster presentation.

2017

1. **M.Y.P.M. Yusof.** ***Accuracy of Willem's Dental Age Estimation in Children***. 2017 International Dental Collaboration of Mekong River (IDCMR) Congress. Vu Manh Tuan School of Odonto-Stomatology, Hanoi Medical University. 19-20 October 2017. Proceeding No. 1042 III.1 Oral presentation.

2. **M.Y.P.M. Yusof**, H.M. Nawawi, M.S. Mahmood. ***Assessment of Different Prediction Models Utilizing Two Predictors for Dental Age Estimation***. 21st Triennial Meeting of the International Association of Forensic Sciences (IAFS). Toronto, Canada. 21 – 25 August 2017.

2016

1. **M.Y.P.M. Yusof**, N. Che Mohamed, H.Nawawi, K.S. Khoo. ***Equivalent dose measurements from digital intra- and extra-oral imaging examinations.*** 3rd International Conference on Science & Social Research (CSSR). The Everly, Putrajaya. 6-7 December 2016. Oral presentation.

2. **M.Y.P.M. Yusof.** ***A New Prediction Formula to Estimate Dental Age in Sub-ad*****ults**. 2016 International Dental Collaboration of Mekong River (IDCMR) Congress. Faculty of Dentistry Universiti Teknologi MARA, Sungai Buloh Campus, Selangor. 17-19 November 2016. Proceeding No. O-24 Oral presentation.

3. I. Wan Mokhtar, **M.Y.P.M Yusof**. ***Repeat Analysis of Digital Intra-oral Radiographs among Final Year Dental Undergraduate Students***. 11th Asian Congress of Oral and Maxillofacial Radiology. Chiang Mai, Thailand. 10-12 November 2016. Proceeding No. O12 Oral presentation.

4. **M.Y.P.M. Yusof.** ***Performance of Willems Method in Estimating Dental Age in Children: A Systematic Review and Meta-analysis***. 2016 International Association of Legal Medicine (IALM) Intersocietal Symposium. Venice, Italy. 21-24 June 2016. Proceeding No. OP 16 Oral presentation.

5. **M.Y.P.M. Yusof.** ***Accuracy Analyses of Different Dental Age Estimation Models in Children and Sub-adults***. 2016 National Convention on Forensic Medicine. Faculty of Medicine Universiti Teknologi MARA, Sungai Buloh Campus, Selangor. 31 May-2 June 2016. Proceeding No. 009 Oral presentation.

2015

1. **M.Y.P.M. Yusof**, R. Cauwels, L. Martens. ***Stages in Third Molar Development and Eruption to Estimate 18-year Threshold***. Int J Paediatr Dent. 2015 Jul;25(S1):46-251. 25th Congress of the International Association of Paediatric Dentistry (IAPD). Glasgow, Scotland. 1-4 July 2015. Proceeding No. PR 06.38 Poster presentation.

2. **M.Y.P.M. Yusof**, R. Cauwels, E. Deschepper, L. Martens. ***How to Utilize the Most Information in Panoramic Radiographs to Estimate Dental Age?*** 23rd Congress of the International Academy of Legal Medicine (IALM). Dubai, United Arab Emirates. 19-21 January 2015. Proceeding No. OP 1.4 Oral presentation.

2014

1. **M.Y.P.M. Yusof**, L. Martens. ***Age Estimation Policies and Procedures for Undocumented Minors in Malaysia***. 66th Annual Scientific Meeting of the American Academy of Forensic Sciences (AAFS). Seattle, WA, United States of America. 17-22 February 2014. Proceeding No. F28 Oral presentation (Extended Abstract).

2013

1. **M.Y.P.M. Yusof**, P.W. Thevissen, S. Fieuws, G. Willems. ***Dental Age Estimation Method for Malay Children Based on All Permanent Teeth Types***. International Organization for Forensic Odonto-Stomatology (IOFOS) Conference. Firenze, Italy. 29–31 August 2013. Abstract No. 233 Oral presentation.

2. P.W. Thevissen, S. Altalie, H. Brki, I. Galic, S. Fieuws, A. Franco, **M.Y.P.M. Yusof**, S.S. Lee, V. Pinchi, G. Willems. ***Comparing 14 Country-Specific Populations on Third Molars Development: Consequences for Age Predictions of Individuals with Different Geographic and Biological Origin***. International Organization for Forensic Odonto-Stomatology (IOFOS) Conference. Firenze, Italy. 29–31 August 2013. Abstract No. 298 Oral presentation.

3. **M.Y.P.M. Yusof**, R. Jacobs. ***Assessment of Neurovascular Canals in the Lateral Maxillary Sinus Wall***. 2nd Meeting of International Association for Dental Research Asia Pacific Region (IADR-APR). Bangkok, Thailand. 21-23 August 2013. Abstract No. 378, pg. 98 Oral presentation.

2008

1. **M.Y.P.M. Yusof**, M. Paiizi, A.A. Aziz, , N.H. Abu Kasim. ***Cutting Efficiency of Dental Burs***. 7th Scientific Meeting of IADR Malaysian Section & 9th Annual General Meeting. Shah Alam, Malaysia. 23 February 2008. Abstract No. J18, pg. 19 Oral presentation.

**Recognitions & Awards**

2022

1. ***Excellent Award*** based on 2021 performance by the Office of Deputy Vice Chancellor for Research and Innovation Universiti Teknologi MARA. Seroja Hall, Universiti Teknologi MARA, Shah Alam. 23 December 2022.

2. ***Gold Award*** for invention ***'Forensic Dental Estimation Lab V.3.0 (F-DentEst Lab V.3.0)'***. Invention, Innovation & Design Exposition (IIDEX 2022). 21 - 25 November 2022. Universiti Teknologi MARA, Shah Alam, Malaysia. Principal Inventor.

3. **2022 SAGE Scientific Prize Award-Journal of Orthodontics Scientific Paper of the Year** by the British Orthodontic Society and SAGE publishing (Paper titled ***Effects of scanning parameters reduction in dental radiographs on image quality and diagnostic performance: A randomised controlled trial***). British Orthodontic Conference, Birmingham, England. 17 September 2022.

2021

1. ***Gold and Diamond Special Award*** for invention ***'Forensic Dental Age Estimation Lab (F-DentEst Lab)'***. International Digital Innovation in Wellness Exhibition 2021 (DInoWEX 2021) under the Professional Innovator category. 8-9 December 2021. University of Malaya, Kuala Lumpur, Malaysia. Principal Inventor.

2. Faculty's Academic Award during Majlis Anugerah Kecemerlangan Akademik (MAKA) 2020/21, Faculty of Dentistry, UiTM. 21 August 2021.
    a. ***Best Researcher Award***
    b. ***Journal Article Publication Award***
    c. ***Most Prolific Writer Award***

3. ***Kreso Glavac Award to the Most Outstanding Innovation (Special Award)*** for invention ***'Forensic Dental Age Estimation Lab (F-DentEst Lab)'***. Malaysia Technology Expo (MTE) 2021 International Innovation Awards. 22-26 March 2021. Principal Inventor.

2020

1. Recipient of the ***National Institute of Health Fogarty International Center of the United States and the Faculty of Medicine, University of Malaya Scholarship Award*** for training in Health Research Ethics (MOHRE) at University of Malaya for 12 months.

2. ***Gold and Diamond Special Award*** for invention ***'Forensic Dental Age Estimation Lab (F-DentEst Lab)'***. Invention, Innovation & Design Exposition (IIDEX 2020). 19 October - 6 November 2020. Universiti Teknologi MARA, Shah Alam, Malaysia. Principal Inventor.

3. ***Silver Award*** for invention ***'Dual-angle Intra-oral X-ray Holder 2.0'***. Invention, Innovation & Design Exposition (IIDEX 2020). 19 October - 6 November 2020. Universiti Teknologi MARA, Shah Alam, Malaysia. Co-Inventor.

4. ***Silver Award*** for invention ***'AI-Powered Semi-automated Dental Age Estimation'***. International Invention & Innovation in Dentistry Exhibition (IIIDentEx 2020)'. 12-20 October 2020. Universiti Teknologi MARA, Sungai Buloh Campus, Malaysia. Co-Inventor.

2019

1. ***2018 Excellent Service Award*** Recepient. 14 June 2019. Universiti Teknologi MARA, Selangor, Malaysia.

2. ***Inducted Fellow of International College of Dentists*** (ICD) for vast contributions in dentistry and Forensic Odontology. Postnominal FICD. 1 July 2019. Chulalongkorn University, Bangkok, Thailand.

2018

1. ***Gold Award and Diamond Special Award (Design)*** for invention ***'Multiple Angle of Bisector Rinn Holder Design'***. Invention, Innovation & Design Exposition (IIDEX 2018). 24-28 September 2018. Universiti Teknologi MARA, Shah Alam, Malaysia. Co-Inventor.

2. ***Faculty's Best Research Author Award*** of 2017 during Dental Academic Awards, Faculty of Dentistry, Universiti Teknologi MARA. 2 March 2018. PAUM Club House, Kuala Lumpur, Malaysia.

3. ***Inducted Fellow of Pierre Fauchard Academy*** (International Honorary Dental Organization) for vast contributions in dentistry and Forensic Odontology. Postnominal FPFPA. 25 January 2018. Grand Hyatt Hotel, Kuala Lumpur, Malaysia.

2017

1. ***Gold Award*** for invention ***'My Dental Age'***. Invention, Innovation & Design Exposition (IIDEX 2017). 25-29 September 2017. Universiti Teknologi MARA, Shah Alam, Malaysia. Principal Inventor.

2. ***Silver Award*** for invention ***'The Bisector®: An Innovative Technology in Dental Radiography'***. 28th International Invention, Innovation & Technology Exhibition (ITEX 2017). 11-13 May 2017. Kuala Lumpur Convention Centre, Malaysia. Principal Inventor.

2016

1. ***Best Oral Presentations (Second Place)*** at the 2016 International Dental Collaboration of the Mekong River Region (IDCMR). 17-19 November 2016. Faculty of Dentistry, Universiti Teknologi MARA, Sungai Buloh, Malaysia.

2. ***Best Oral Presentations (Second Place)*** at the 2016 National Convention on Forensic Medicine. 31 May – 2 June 2016. Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh, Malaysia.

3. ***Bronze Award*** for invention ***'The Bisector®: A New Technology in Dental Radiography'***. Invention, Innovation & Design Exposition (IIDEX 2016). 20-23 September 2016. Universiti Teknologi MARA, Shah Alam, Malaysia. Principal Inventor.

4. ***First runner-up*** for Men's Double Table Tennis UiTM Closed Championship. 5 November 2016. Selayang Campus Universiti Teknologi MARA, Malaysia.

## *Intelectual Properties*

**Copyrights**

1. Forensic Dental Estimation Lab (F-DentEst Lab) (CRLY00024427) on 4 August 2020 – **Main Inventor**
2. Video For Innovation Competition: Forensic Dental Estimation Lab (F-DentEst Lab) (CRFM00001313) on 8 January 2021 – **Main Inventor**
3. The Bisector: An Innovative Technology in Dental Radiography (LY2016002149) (CRLY00004860) – **Main Inventor**
4. My Dental Age (AR2017003326) – **Main Inventor**
5. Image Filtering and Feature Selection Technique to Enhance Cone Beam CT Trabecular Bone Microstructure Quantification (LY2018006668) – **Co-Inventor**
6. Comparison of Bimaxillary Protrusion Occlusion Morphology: A Geometric Morphometric Analysis (CRLY00020527) on 14 November 2019 – **Co-Inventor**
7. Dual-angle Intra-oral X-ray Holder (CRLY00025225) on 23 September 2020 – **Co-Inventor**
8. Dual-angle Intra-oral X-ray Holder 2.0 (CRFM00001305) on 8 January 2021 – **Co-Inventor**
9. Optimization of Scanning Parameters in Dental Panoramic Tomograph and Lateral Cephalograph Acquisition for Adult Orthodontic Patients (CRLY00020543) on 14 November 2019 – **Co-Inventor**
10. Efficiency of Drone-assisted Procedures in Difficult-to-Access Sites and Dangerous Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Environments for Disaster Victim Identification (DVI) in Comparison with Conventional Manual Procedures (CRFM00001300) on 17 November 2020 – **Co-Inventor**
11. Retrieval of Identifiers in Disaster Victim Identification (DVI): Comparison Between Drone-assisted and Conventional Procedures (CRLY00027207) on 17 November 2020 – **Co-Inventor**

**Patent**

1. A Dental Inspection Apparatus (PI2020005321). ***Patent Filing*** on 7 January 2020 – **Principal Investigator**.

**Nor Wati @ Nur AtikahMustafa**

**(Lecturer in Prosthodontics)**

Centre For Restorative Dentistry Studies,
Faculty of Dentistry, UiTM Sg. Buloh Campus,
Jalan Hospital, 47000 Sg Buloh, Selangor
Staff ID: 248354
Contact no: +603-61266655
Email: norwati_atikah@uitm.edu.my

## Educational Backgrounds

| | |
|---|---|
| **Education Qualification:** | [ 2010-2014 ]<br>University of Malaya: Master of Clinical Dentistry (Restorative in Prosthetic Dentistry)<br><br>[ 1999-2004 ]<br>University Science of Malaysia<br>Degree of Dental Surgery (DDS) |

## Current Professional Membership

Membership in the Professional Society

Malaysia Association for Prosthodontics
National Specialist Register

## Working Experience

### ACADEMIC CAREER

| | |
|---|---|
| 2014 - current | Senior Lecturer Restorative Dentistry (Prosthodontics), Faculty of Dentistry, UiTM.<br>2025 Head of Centre of Restorative Dentistry Studies<br>2024: Postgraduate Coordinator DCP 974<br>Lecturer in charge MsCD programme (DPR 701)<br>2020 – current: Pursue PhD in Implant Dentistry<br>2019 – 2020: Postgraduate Coordinator:<br>Master in Science (Prosthodontics) - DCP 701,<br>DClinDent in Prosthodontics (DS933), |

| | |
|---|---|
| | Doctor in Prosthodontics (DS 974)<br>2018 – 2019: Postgraduate Coordinator – Prosthodontics (DCP 901)<br>2018: Module Coordinator for DPR 602 (Prosthodontic)<br>2017 – 2018: Resource Person – Prosthodontic Module (DPR 602)<br>2015 – 2017: Module Coordinator DRD 501 (Prosthodontic) |
| 2009 - 2014 | Trainee Lecturer<br>Restorative Dentistry (Prosthodontics), Faculty of Dentistry, UiTM |

| PREVIOUS WORKING EXPERIENCE | |
|---|---|
| 2007 - 2009 | Dental Officer<br>Klinik Pergigian Shah Alam, seksyen 7, Shah Alam, Selangor. |
| 2006 - 2007 | Dental Officer<br>Jabatan Bedah Mulut, Hospital Selayang, Selangor |
| 2005 - 2006 | Dental Officer<br>Klinik Pergigian Mukim Batu, Jalan Ipoh, Kuala Lumpur |
| 2004 - 2005 | First Year Dental Officer (FYDO) in:<br>Klinik Pergigian Mukim Batu<br>Klinik Pergigian Cahaya Suria (Periodontology attachment) Klinik Pergigian Jelatek, Kuala Lumpur (Orthodontic attachment)Hospital Putajaya (OMFS attachment) |

## Academic Awards & Achievements

- International Invention & Innovation in Dentistry Exhibition 2024: A Novel Vibrating Fiber Optic (VFO) System for Implant Stability Measurement (**Silver Award**)
- International Invention & Innovation in Dentistry Exhibition 2022: Versy-T Implant Abutment: Retentive and Effective **(Gold Award)**
- International Invention & Innovation in Dentistry Exhibition 2020: ACOU@PLAY **(Silver Award)**
- International Invention & Innovation in Dentistry Exhibition 2020: Augmented Reality Interactive Systems for Dental Care (ARIS-DentC) **(Bronze Award)**
- Invention, Innovation & Design Exposition 2019: RoseCinn: Be Confidence with YourSmile! **(Gold Award)**
- International Invention & Innovation in Dentistry Exhibition 2019: Making Jaw RelationRecord Hijab-Friendly with Jaw-Reg Aid **(Gold Award)**
- Anugerah Perkhidmatan Cemerlang 2017
-

## Academic Contribution

- Reviewer of RSIS International Journals (2025)
- Reviewer of Journal of International Oral Health (since 2024)
- Resource Person DPR 602 (2025)
- Ahli Jawatankuasa Kecil Kurikulum Fakulti (2020)
- Postgraduate Coordinator (Master in Prosthodontic), DPR 701 (2019-2020)
- Postgraduate Coordinator (DClinDent Prosthodontic), DCP 901 (2018-2020)
- Problem Based-Learning Committee (2019-2020)
- Resource Person for DPR 602 (2017-2018) (Prosthodontic)
- Course Coordinator for DRD 501 (2015-2016) (Prosthodontic)
- Quality Team Member (AKNC head) (2015-2018)

## Field of Expertise

Removable Prosthodontics
Maxillofacial Prosthodontics

## Research Interest

Dental Material
Removable Prosthodontics
Maxillofacial Prosthodontics
Implant Prosthodontics
Natural Products in Prosthodontics

## Research Supervision

| No | Level of Study | ID Number | Student's Name | Year enrolled | Year end | Role | Achievement |
|---|---|---|---|---|---|---|---|
| 1 | MsCD | 920216086221 | Amal Shafiq bin Dalal | 2024 | 2028 | | |
| 2 | PhD | 2019956757 | Ayoub ZabidaAli Ramadan | 2019 | | Co-supervisOr (2019 – 2020) | |
| 3 | DclindDent (Prostho) | 2017629726 | Mohd Zulkifli Kassim | 2017 | 2021 | Main supervisor | Best 3MT 2020 Best Oral Presenter 2019 |

## Completed Research Supervision

| No | Level of Study | ID Number | Student's Name | Year enrolled | Year end | Role | Achievement |
|---|---|---|---|---|---|---|---|
| 1 | Degree | 2016259626 | Nur Humaira Ishak | 2016 | .2020 | Main supervisor | Best Research Award in DSS2020 |
| 2 | Degree | 2016259622 | Nur Athirah Rosli | 2016 | 2020 | Main supervisor | |
| 3 | Degree | 2016259698 | Muhamad Zafir Ashman B Zulkifli | 2016 | .2020 | Co-supervisor | |
| 4 | Degree | 2016259612 | Ain Najihah Abd Rahman | 2016 | .2020 | Co-supervisor | |
| 5 | Degree | 2014250238 | Nurul Farahida BintiAffandi | 2014 | 2018 | Co-supervisor | Won Closed Category Students Symposium 2018 (2nd place) |
| 6 | Degree | 2014213564 | Nur Aliya Filza BintiMohd Ayub | 2014 | 2018 | Co-supervisor | |
| 7 | Degree | 2012424258 | Siti Nur Atiqah BintiMohd. Kadis | 2012 | 2016 | Main supervisor | Won Special Consolation |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | Degree | 2012610122 | Nurul Suhaila BintiAdnan | 2012 | 2016 | Main supervisor | Prize (Oral Presentation in DSS 2016) |
| 9 | Degree | 2011238658 | Nor Aishah Binti Ahmad Yusri | 2011 | 2016 | Main supervisor | |
| 10 | Degree | 2011657656 | Noor Syamimi BintiAdnar | 2011 | 2016 | Main supervisor | |

## Thesis Examiner

| Year | Candidate | Instituition |
|---|---|---|
| 2020 | Dr Sayfaldeen Muhannad Ali (DclinDent in Prosthodontics) | UiTM |

## Publication

### Prosthodontic Textbook

1. Hazlina Abd Ghani & **Nor Wati @ Nur Atikah Mustafa,** Comprehensive Guide to Removable Partial Denture. UiTM Press, ISBN 978-967-363-599-3

### Prosthodontic Textbook Chapter

1. **Nor Wati @ Nur Atikah Mustafa,** Hazlina Abd Ghani, 'Acrylic Partial Denture' In Comprehensive Guide to Removable Partial Denture, UiTM Press, 191-196
2. Aiemeeza Rajali, Tengku Fazrina Tengku Mohd Ariff, Hazlina Abd Ghani**, Nor Wati @ Nur Atikah Mustafa**, 'Denture Processing and Deflasking' In In Comprehensive Guide to Removable Partial Denture, UiTM Press, 155-170
3. Hazlina Abd Ghani, **Nor Wati @ Nur Atikah Mustafa**, Aiemeeza Rajali, Lim Tong Wah, 'Alternate Denture Design' In In Comprehensive Guide to Removable Partial Denture, UiTM Press, 197-202
4. Hazlina Abd Ghani, Nurul Whahidah Azmi, Lim Tong Wah, **Nor Wati @ Nur Atikah Mustafa**, Introduction In In Comprehensive Guide to Removable Partial Denture, UiTM Press, 1-6
5. Lim Tong Wah, Hazlina Abd Ghani, **Nor Wati @ Nur Atikah Mustafa**, Aiemeeza Rajali, 'Master Impression' In In Comprehensive Guide to Removable Partial Denture, UiTM Press, 59-92
6. Tengku Fazrina Tengku Mohd, **Nor Wati @ Nur Atikah Mustafa,** Aiemeeza Rajali, Ariff, Hazlina Abd Ghani, 'Teeth Set-Up and Teeth Try-In' In In Comprehensive Guide to Removable Partial Denture, UiTM Press, 145-154
7. **Nor Wati @ Nur Atikah Mustafa**, Hazlina Abd Ghani, Aiemeeza Rajali, Nurul Whahidah Azmi, 'Denture Insertion and Review' In In Comprehensive Guide to Removable Partial Denture, UiTM Press, 179-190
8. Lim Tong Wah, Hazlina Abd Ghani, **Nor Wati @ Nur Atikah Mustafa**, 'Master Cast Fabrication and Duplication' In Comprehensive Guide to Removable Partial Denture, UiTM Press, 101-110
9. Eleena Mohd Yusuf, **Nor Wati @ Nur Atikah Mustafa**, Aiemeeza Rajali, Lim Tong Wah, Tengku Fazrina Tengku Mohd Ariff, 'Framework Fabrication and Try-in' In Comprehensive Guide to Removable Partial Denture, UiTM Press, 117-130
10. Hazlina Abd Ghani, Aiemeeza Rajali, **Nor Wati @ Nur Atikah Mustafa**, Lim Tong Wah, 'Surveying and Denture Design' In In Comprehensive Guide to Removable Partial Denture,

UiTM Press, 35-58

Tengku Fazrina Tengku Mohd Ariff, Aiemeeza Rajali, **Nor Wati @ Nur Atikah Mustafa**,Hazlina Abd Ghani, 'Jaw Relation Record and Master Cast Mounting' In Comprehensive Guide to Removable Partial Denture, UiTM Press, 131-144

## Chapter In Research Book

1. Nur Humaira Ishak, Nur Athirah Mohd Rosli, Muhamad Zafir Ashman Zulkiflee, Ain Najihah Abd Rahman, Nur Dalila Abdullah, **Nor Wati @ Nur Atikah Mustafa** & Aiemeeza Rajali, 'Let's Use 'ACOU@PLAY' – For Better Comfort in Dental Management" In Bridging Health Professionals and Communities through Innovation, 85-90
2. Aiemeeza Rajali, Nik Rahayyu Nik Zulkifeli, **Nor Wati @ Nur Atikah Mustafa** & Nur Dalila Abdullah, 'Augmented Reality Interactive Systems for Dental Care (ARIS-DentC)'- In Bridging Health Professionals and Communities through Innovation, 97-102
3. **Nor Wati @ Nur Atikah Mustafa**, Tengku Fazrina Tengku Mohd Ariff, Aiemeeza Rajali, Muhammad Zarif Mohd Sadali, Budi Aslinie Mohd Sabri, Hazlina Abd Ghani, 'Jaw Relation Record Hijab-Friendly with Jaw-Reg Aid' In Sustainable Oral Health Through Innovative Solutions, 77-84.

## Journal Article

1. **Nor Wati Nur Atikah Mustafa**, Rohana Ahmad, Muhammad Asif Ahmad Khushaini, Nur Hafizah Kamar Affendi, Siti Mariam Ab Ghani, Su Keng Tan, Muhammad Hussain Ismail, Chui Ling Goo, Mohd Zulkifli Kassim, Tong Wah Lim, and Lay Kek Porous NiTi Dental Implant Fabricated by a Metal Injection Molding: An in Vivo Biocompatibility Evaluation in an Animal ModelThe *ACS Biomaterials Science & Engineering* **2024** *10* (1), 405-419. DOI: 0.1021/acsbiomaterials.3c01551
2. **Mustafa N. W. N. A**., Ahmad R. Kamar Affendi N. H., Sulaiman E. Khushaini M. A. A., Ismail M. H. Teh L. K., Salleh M. Z.). In vitro evaluation of cytotoxicity and genotoxicity of porous nickel titanium dental implants produced by metal injection molding technique. J Biomed Mater Res B Appl Biomater. 2024 Jan;112(1):e35306. doi: 10.1002/jbm.b.35306. Epub 2023 Jul 31. PMID: 37522375.
3. Kassim MZ, **Mustafa NWNA**, Ahmad R, Baba NZ (2024). The effect of brand, thickness, and abutment substrate on the masking ability of monolithic zirconia ceramics. Arch Orofac Sci, 19(1): 19–30. https://doi.org/10.21315/aos2024.1901.OA02.
4. Ayoub Zabida, Hazlina Abdul Ghani*, **Nor Wati Nur Atikah Mustafa**, Mohamed Ibrahim Abu Hassan. The Effect of Different Methods of Nano SiO2 coating on Thermoplastic Partial Denture Clasp Materials and Their Effect on Hydrophobicity. Compendium of Oral Science 11(1) 2024, 23 – 34. DOI: 10.24191/cos.v11i1.26034
5. Rajali, A., **Mustafa, N**., Zulkiflee, M., Abd Rahman, A., & Ahmad, R. The Impact of The Labial Flange and Artificial Teeth on Lip Support in Elderly Patients with Maxillary Complete Dentures. J Dent Indones. 2022;29(2): 127-133
6. Kassim, M. Z., **Mustafa, N. W. N. A.**, Ahmad, R., Ab Ghani, S. M., Abdul Ghani, H. (2021). Masking Ability of Translucent Monolithic Zirconia Ceramic: The Effect of Thickness. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 12(9), 12A9G, 1-9. http://TUENGR.COM/V12/12A9G.pdf DOI: 10.14456/ITJEMAST.2021.175
7. **Mustafa, N. W. N. A.**, Ishak, N. H., Rosli, N. A. M., Zulkifeli, N. R. N., & Rajali, A. (2021). Self-preference music for gagging patient: Effect on physiology and oral health-related quality of life during dental impression. *Complementary Therapies in Clinical Practice*, *43*, 101392 (WOS)

8. Alsrouji MS, Ahmad R, Rajali A, **Mustafa N**, Ibrahim N, Baba N. Mandibular implant-retained overdentures: potential accelerator of bone loss in the anterior maxilla? Journal of Prosthodontics 2019,28(2):764-770 (Q1)
9. Rohana Ahmad, Nurul Farahida Affandi, Nur Aliya Filza Mohd Ayub, **Nur Atikah Mustafa,** Mohd Yusmiaidil Putera Mohd Yusof, Tuti Ningseh Mohd Dom. The Value of Panoramic Radiograph as Screening Tool Prior to Complete Denture Construction. Journal of Dentistry Indonesia 2019,26(2): 65-69 (ISI)

## Other Publication

1. MOOC Removable Partial Prosthodontics, Electronic Media, https://ufuture.uitm.edu.my/courses/summary/DRP412

## Proceedings

2024

1. **Nor Wati Nur Atikah Mustafa** *, Siti Mariam Ab Ghani, Indah Mohd Amin, Muhammad Asif Ahmad Khushaini, Nur Hafizah Kamar Affendi, Su Keng Tan, Eshamsul Sulaiman, Rohana Ahmad. Interactions of Cell-Porous NiTi Biomaterial and Nickel Ion Release. International Dental Journal. https://doi.org/10.1016/j.identj.2024.07.298
2. Muhammad Amal Abd Wahab, Rohana Ahmad, Eleena Mohd Yusof, **Nor Wati Nur Atikah Mustafa**, Teh Lay Kek. Differential protein expressions associated with dental implant healing. International Dental Journal https://doi.org/10.1016/j.identj.2024.07.1127

2022

1. Nur Hafizah Kamar Affendi, Ammar Yaseer Bin Abdul Hakim @ Abdul Khakin, **Nor Wati @ Nur Atikah Mustafa**, Rohana Ahmad, Muhammad Asif bin Ahmad Khushaini. Versy-T Implant Abutment: Retentive and Effective. International Invention & Innovation in Dentistry Exhibition 2022

2020

1. Muhamad Zafir Ashman B Zulkifli, Ain Najihah Abd Rahman, Aiemeeza Rajali, **Nur Atikah Mustafa.** Preference of Lip Support in Maxillary Prostheses Design. 10th Dental Student Symposium, Faculty of Dentistry, UiTM.
2. Nur Humaira Ishak, Nur Athirah Rosli, **Nur Atikah Mustafa**, Aiemeeza Rajali. Musical Intervention in Gagging Reflex Condition During Impression Taking. 10th Dental Student Symposium, Faculty of Dentistry, UiTM.

2019

2. Vivi Noryati Ahmad, Nurhayati Muhamad Zain, Indah Mohd Amin, **Nor Wati @ Nur Atikah Mustafa**, Aiemeeza Rajali. RoseCinn: Be Confidence With Your Smile!. Invention, Innovation & Design Exposition, UiTM 2019
3. **Nor Wati @ Nur Atikah Mustafa**, Tengku Fazrina Tengku Mohd Ariff, Aiemeeza Rajali, Muhammad Zarif Mohd Sadali, Budi Aslinie Mohd Sabri, Hazlina Abd Ghani. Jaw Relation Record Hijab-Friendly with Jaw-Reg Aid. International Invention & Innovation in Dentistry Exhibition 2019

2017

1. Mohd Kandis SNA, Mat Daud SN, **Mustafa NA**, Othman NI. Efficacy of Nigella Sativa on Eradication of Candida albicans on Acrylic Denture Base. 7th Dental Student Symposium, Faculty of Dentistry, UiTM.

## Innovation

1. Vibrating Fiber Optic (VBO) System for Implant Stability Measurement (CRD2024W06304)
   Team member:
   i. **Nor Wati @ Nur Atikah Mustafa**
   ii. Aiemeeza Rajali
   iii. Muhammad Asif Ahmad Khushaini
   iv. Rohana Ahmad

2. ACOU@PLAY. CR002130
   Team member:
   i. Muhamad Zafir Ashman B Zulkifli
   ii. Ain Najihah Abd Rahman
   iii. Aiemeeza Rajali
   iv. **Nur Atikah Mustafa**
   v. Nur Dalila Abdullah

3. Augmented Reality Interactive Systems for Dental Care (ARIS-DentC) - CR002130
   Team member:
   i. Aiemeeza Rajali
   ii. **Nur Atikah Mustafa**
   iii. Nik Rahayyu Nik Zulkifeli
   iv. Nur Dalila Abdullah

4. Hijab-Friendly Jaw Relation Record Aid. CRLY00020480
   Team member:
   i. **Nur Atikah Mustafa**
   ii. Hazlina Abd Ghani
   iii. Aiemeeza Rajali
   iv. Tengku Fazrina Tengku Mohd Ariff
   v. Budi Aslinie Mohd Sabri
   vi. Muhamad Zarif Mohd Sadali

## Grant

1. The Roles of Laser Power, Scan Rate, Scan Spacing and Build Direction for Optimum Surface Roughness in Additive Manufacturing of Denture Framework. National Level, RM 159,930.00
   **Team member:**
   i. Aini Hayati Binti Abdul Rahim
   ii. Rohana Binti Ahmad
   iii. Muhammad Hussain Bin Ismail
   iv. Aiemeeza Binti Rajali
   v. **Nor Wati @ Nur Atikah Binti Mustafa**

2. Exploring The Potential Use of Glass Fiber and Nano-Particle Silicon Dioxide Over The Non-Metallic Thermoplastic Denture Clasp Material. University Level. RM 20 000
   **Team member**:
   i. Mohamed Ibrahim Bin Abu Hassan
   ii. Aiemeeza Binti Rajali
   iii. **Nor Wati @ Nur Atikah Binti Mustafa**


Dr. Melati Binti Mahmud
Lecturer
Clinical Specialist (Prosthodontist)

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Faculty of Dentistry, Sungai Buloh Campus,
Universiti Teknologi MARA
Jalan Hospital, 47000 Sungai Buloh,
Selangor
Telephone: +6 0172309274
Email: melatimahmud@salam.uitm.edu.my
Date of birth: 31 December 1987


## ACADEMIC QUALIFICATIONS

| QUALIFICATION | YEAR | INSTITUTION |
|---|---|---|
| Doctor of Clinical Dentistry in Prosthodontics (DClinDent) | 2018 | The University of Adelaide, Australia |
| Bachelor of Dental Surgery (BDS) (Distinction) | 2011 | Universiti Teknologi Mara, Malaysia |

## MEMBERSHIP IN PROFESSIONAL SOCIETIES/BODIES/ASSOCIATIONS

| ASSOCIATIONS | PERIOD | ROLE |
|---|---|---|
| Malaysian Dental Association (MDA) | From 2011 | Member |
| Malaysian Association of Aesthetics Dentistry (MAAD) | From 2020 | Member |
| Malaysian Association for Prosthodontics (MAP) | From 2018 | Member |
| Association of Australia New Zealand Prosthodontist (AANZP) | From 2013 | Member |

## AWARDS & ACHIEVEMENTS

| AWARDS | YEAR |
|---|---|
| Bronze Award for IIDENTEX: A 3D Tooth preparation | 2022 |
| Silver Award for ITEX: Bite Force Recorder | 2021 |
| Gold Award for IIDEX: Wireless Sensor Network: A bite force recorder | 2021 |
| Bronze Award for IIDENTEX: There is No Planet B | 2020 |
| Winner of Excellent Royal Medal from His Royal Highness of Malaysia at UiTM's 75th Convocation | 2011 |
| Best Overall Student of Bachelor of Dental Surgery 2006/2011 Dentistry at UiTM's 75th Convocation | 2011 |
| Book Prize Award for Restorative Dentistry | 2011 |
| Best Student Award for Fourth Professional Examination | 2010 |
| Book Prize Award for Oral & Maxillofacial Surgery, Oral Medicine & Oral Imaging | 2010 |
| Deans' Award for Fourth Professional Examination IV 2009 | 2010 |

## GRANTS

| | | |
|---|---|---|
| Melati Mahmud, Lim Tong Wah | An Evaluation of Occlusal Forces In Endodontically Treated Teeth And Teeth With Reduced Periodontal Support | RM 20 000 |

## PUBLICATIONS

1) J Dudley, F Mughal, E Hotinski, M Mahmud. Prosthodontic management of maxillofacial cases: a case series. Australian Dental Journal. 2017; 63: 124–128

2) M Mahmud. Multidisciplinary management of anterior tooth wear. Indian Prosthodontic Journal 2018; 55

3) M Mahmud, L Richards, J Dudley. The use of a psychological testing instrument as an indicator of dissatisfaction with aesthetic dental treatment – a preliminary study. BMC Psychology 8. 2020; 24

4) TW Lim, AG Siti Mariam, M Mahmud; Occlusal re-establishment and clinical complications of resin-bonded fixed partial dental prostheses cemented at an increased occlusal vertical dimension: A retrospective study. Journal of Prosthetic Dentistry. 2020

| |
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| 5) TW Lim, AG Siti Mariam, M Mahmud; Response to Letter to Editor on "Occlusal re-establishment and clinical complications of resin-bonded fixed partial dental prostheses cemented at an increased occlusal vertical dimension: A retrospective study".Journal of Prosthetic Dentistry 2022;127(4):671-672 |
| 6) N. Norman, A. A A Othman, N. A A, TW Lim, ZHM Kassim, S H Abdul Ghani, M Mahmud; Layperson's Perception Towards Gummy Smile and Facial Types: Acceptability and Treatment Benefit. Journal of Dentistry Indonesia 2022;29(1):24-29 |
| 7) Nurul Hayati Mohamad Zainal, Norsuhana Omar, Rosmaliza Ramli,Melati Mahmud*,Noor Hafizah Abdul Salim; Augmented Reality (AR) and Virtual Reality (VR) Applications During Covid-19 Pandemic Among Preclinical Medical and Dentistry Students: A Mini-Review. Malaysian Journal of Medicine & Health Sciences. 2022. |
| 8) Mohd Khairul Firdaus Mazlan,Rohana Ahmad,Melati Mahmud, Tong Wah Lim; Measurement of maximum occlusal force using digital occlusal force measurement device: a scoping review. Malaysian Journal of Medicine & Health Sciences. 2022. |
| 9) Book Chapter:<br>i. M Mahmud, E M Yusof. EZReg: Maxillo-mandibular Relationship in a Breeze, UiTM Press, 2020<br>ii. M Mahmud, TW Lim, E M Yusof. There Is No Planet B, UiTM Press 2020 |
| **CASE REPORT COMPETITION:** |
| 1) Case report: Global Ceram-X Competition 2010/2011 DENSTLY Asia – 4$^{th}$ placed |
| 2) Case report: Global Ceram-X Competition 20182019 DENSTLY Asia – Supervisor Student: Ahmad Yusri Kudus |

## PRESENTATION AT INTERNATIONAL AND LOCAL SCIENTIFIC CONFERENCES

| PRESENTATION | INSTITUTION | ROLE | YEAR |
|---|---|---|---|
| | | | |
| Treatment Preferences and Trends for Restoration of Endodontically Treated Teeth: A Clinical Audit | 12th UiTM Dental Student Scientific Symposium | Supervisor | 2022 |

| | | | |
|---|---|---|---|
| A combination of Direct Composite Restoration using Injetcion Moulding Technique and Indirect Full Coverage Restoration in Managing Amelogenesis Imperfecta | 45th European Prosthodontics Association Congress, Sienna Italy | Participant | 2022 |
| COUNTRY SPEAKER : Strategies in Optimizing Aesthetic Rehabilitation Cases | Asian Academy of Prosthodontics | Invited Speaker | 2022 |
| Direct Composite Veneer | Ancora Imparo | Invited Speaker | 2022 |
| Earth Smile (Silver Award) | IIIDentEx, UiTM (Innovation) | Participant | 2020 |
| Prosthodontics Principle & Clinical Application in Multidisciplinary Dental Treatment. | Study club, UiTM | Invited speaker | 2019 |
| Cementation Today. | Dental Colloqium, UiTM | Speaker | 2019 |
| Road to postgraduate study. | PASADENT, KL | Invited speaker | 2019 |
| Interdisciplinary Management of Localized Anterior Tooth wear. | MAP, Hotel Istana KL | Poster presenter | 2018 |
| Relationship between treatment outcome and Psychological profile using SCL-90-R. | School of Dentistry, The University of Adelaide | Oral presenter | 2017 |
| Plaque score in Diabetes Type II patient attending dental clinic UiTM. | Dental Student Symposium, UiTM | Poster Presenter | 2010 |
| Dental fear among UiTM undergraduate students. | Asia Pacific Dental Student Association Conference, Surabaya, Indonesia | Oral presenter | 2007 |

## WORKING EXPERIENCES

| FACILITIES | DESCRIPTION | ROLE | YEAR |
|---|---|---|---|
| Universiti Teknologi Mara, Cawangan Sg Buloh, Malaysia | Responsibilities include teaching, research and clinical supervision of undergraduate and postgraduate students | Lecturer in Prosthodontics | 2012 till present |
| School of Dentistry The University of Adelaide: | Clinical supervision for Bachelor of Dental surgery student<br>1) Fixed prosthodontics simulation clinic practical for year 3 and 4students<br>2) Fixed prosthodontics clinic year 4 (2014)<br>3) Removable prosthodontics clinic year 4 (2015-2016)<br>4) General dental practice clinic year 3 (2017)<br>(Responsibilities include teaching as well as clinical work and supervision). | Credentialled clinical supervisor | 2013-2017 |
| Specialist-in-Training, Prosthodontics (Full Time) at Adelaide Dental Hospital, South Australia | Responsible as clinical work and dental health courses for continuous training e.g. CPR training, Staff care training | Credentialled clinical registrar | 2013-2017 |
| Mahidol University, Bangkok, Thailand | A one-month course as part of D Clindent Prosthodontic Program. Responsible for treating patient with maxillofacial defect e.g. obturator, eye prosthesis, ear prosthesis and orbital. | Maxillofacial Registrar | March 2017 |
| Universiti Teknologi Mara, Shah Alam Malaysia | Responsibilities include teaching, research and clinical supervision of undergraduate | Trainee lecturer in Prosthodontics | 2012-2013 |
| | | | |
| • Specialist Dental Clinic Lina, Bukit Jelutong<br>• Klinik Pergigian Lina, Damansara | Providing dental treatment include restorations, extraction, endodontic treatment and general dentistry | LOCUM | 2012 |

## CONTRIBUTIONS TO SOCIETY

| VENUE | DESCRIPTION | ROLE | YEAR |
|---|---|---|---|
| Sekolah Kebangsaan Bandar Anggerik Shah Alam (School Science Day) | Mobile Dental Clinic Program | Lecturer in Prosthodontics | 2019 |
| Kampung orang Asli, Simpang Pulai, Cameron Highlands | Mobile Dental Clinic Program UiTM (Providing and supervising dental treatment) | Clinical Supervisor | 2012 |
| TV3 Bandar Utama, Damansara, Selangor | Mobile Dental Clinic Program UiTM Oral Health Promotion talk for MHI (Malaysia Hari Ini) | Clinical Supervisor | 2012 |
| Universiti Teknologi Mara Cawangan Kuala Pilah, Negeri Sembilan | Mobile Dental Clinic Program UiTM (Providing and supervising dental treatment) | Clinical Supervisor | 2012 |
| Universiti Teknologi Mara Cawangan Segamat, Johor | Mobile Dental Clinic Program UiTM (Providing and supervising dental treatment) | Clinical Supervisor | 2012 |

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|---|---|---|---|
| Universiti Teknologi Mara Cawangan Lendu, Melaka | Mobile Dental Clinic Program UiTM (Providing and supervising dental treatment) | Clinical Supervisor | 2012 |
| Sek.Keb.Lenga, Pagoh, Johor | Operasi Khidmat Masyarakat (OPKIM), Oral health promotion | Participants | March, 2010 |
| Sek.Ren.Agama Integrasi (SERAI), Seksyen 19,Shah Alam, Selangor | Primary School Dental Service | Participants | Jan 2010-Dec 2010 |
| Poliklinik Seksyen 7, Shah Alam,Selangor | Oral Health Talk to Antenatal Mothers | Presenter | 2011 |

## JOB SCOPE IN ACADEMIC AND CLINICAL SPECIALIST, FACULTY OF DENTISTRY, UITM

| JOB SCOPE | DESCRIPTION | CODE | YEAR |
|---|---|---|---|
| Course coordinator | Monitor student progress | DPR 602 | 2022-present |
| Supervisor for undergraduate students | 1) Lecture<br>2) Clinical Supervision<br>3) Exam<br>4) Problem Based Learning<br>5) Tutorial and seminar | DPR 602<br>DCC 607 | 2017-present |
| Head of OSCE | MOCK OSCE Exam DPR 602 | DPR 602<br>DCC 607 | January 2018 |
| Main supervisor for undergraduate research | Elective research projects:<br>'Emotional exhaustion fluctuation among dentist- Diary study'<br>Students: Nikki Louina Daniella<br>Syakirah Sahar | DPR 602 | 2017-2019<br>Completed |
| Co- supervisor for undergraduate research | Elective research projects:<br>'UiTM dental students' posture, is it satisfactory?'<br>Students: Amir Hazim<br>Siti Aishah | DPR 602 | 2017-2019<br>Completed |
| Supervisor for postgraduate students | 1) Multidisciplinary Journal Club<br>2) Prosthodontics Journal Club<br>3) Clinical Supervision | DCP 901<br>DCE 901 | 2018-present |
| Co- supervisor for postgraduate research | Tittle: Maximum Bite Forces in Endodontically Treated Teeth and Periodontal Compromised Teeth<br>Student: Ahmad Firdaus Mazlan | DCD 501 | 2019-present |
| Supervisor for table clinic (year 2 students) | Dental Student Symposium | DPR 602 | 10 February 2020 |
| Main supervisor for undergraduate research | Elective research projects:<br>Treatment Preferences and Trends for Restoration of Endodontically Treated Teeth: A Clinical Audit<br>Students: Ellis Farhana<br>Nur Kamaliah | DPR 602 | 2020- present |
| Member/ Developer | Massive Open Online Courses (MOOC) Fixed Partial Dental Prosthesis | DPR 602 | 2021- present |

## OTHER RESPONSIBILITIES

| ADMINISTRATIVE DUTIES | | | |
|---|---|---|---|
| **JOB SCOPE** | **VENUE** | **DESCRIPTION** | **YEAR** |
| Internal Board of Studies | Dental Surgery Assistant Diploma Program | Coordinator of modules and syllabus. Preparation the documentation for a new program | 2020- present |
| Secretary | Center of Restorative Studies, Faculty of Dentistry, UiTM | Preparation of meeting minute for department members | 2017-2020 |
| Coordinator UiTM Press | As representative for Faculty of Dentistry, UiTM | Liase with UiTM Press for book and online publication | 2019-present |
| Clinic Manager | Specialist Prosthodontic Clinic, UiTM | Maintain the clinic in order, order new dental materials and inventory | 2018-present |
| Lecturer in Charge (LIC) | Center of Restorative Studies, Faculty of Dentistry, UiTM | To make sure year 2 students' progress keep on track | 2019-present |
| LIC for extended student (DCD 501) | Center of Restorative Studies, Faculty of Dentistry, UiTM | To make sure year 5 students' progress keep on track | 2018 |
| **EVENT MANAGEMENT** | | | |
| **ROLE** | **ACTIVITIES** | **ASSOCIATION** | **LEVEL** |
| Scientific Committee | UiTM Dental Students Symposium 2021 | Faculty of Dentistry | Faculty |
| Secretary | New Year New You 2020<br>2 days program involving workshop and lectures by outside speaker<br>Date: 7 & 8 February 2020 | Center of Restorative & Center of Orthodontics and Pediatric Dentistry | Faculty |
| Refreshments Committee | Dental Student Symposium<br>Date: 10 February 2020 | Faculty of Dentistry, UiTM | Faculty |
| Invited interviewer | Finishing School Program | Faculty of Dentistry, UiTM | Faculty |
| Workshop Committee | Digital Planning with 3-Shape Intraoral Scanner Workshop<br>Date: 16 November 2019 | Malaysian Association for Prosthodontics (MAP) | National |
| Scientific Committee | Biennial Congress of AAP<br>Date: September 2018 | Malaysian Association for | International |

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|---|---|---|---|
| | | Prosthodontics (MAP) | |
| Registration Committee | Women in Dentistry<br>Date: 2 & 3 July 2018 | Faculty of Dentistry, UiTM | Faculty |
| Representative | Mengubah Destini Anak Bangsa Program at UiTM Dengkil<br>Date: February 2018 | UiTM Main Campus | University |
| Protocol Committee | Dental Student pre-symposium & Symposium<br>Date: February 2018 | Faculty of Dentistry, UiTM | Faculty |

## SEMINAR/COURSES ATTENDED

| JOB SCOPE | ORGANISER | DATE |
|---|---|---|
| Annual Grand Meeting: Malaysian Association of Aesthetics Dentistry | MAAD, KL | 2021 |
| Soft Skill Workshop | Faculty of Medicine, UiTM | 2019 |
| A crown down approach. Implant treatment planning by Dr Marcus Dagnelid | Faculty of Dentistry, UiTM | 2018 |
| Research Day | The University of Adelaide | 2017 |
| Student exchange Adelaide- Mahidol for Maxillofacial Course | Mahidol University, Bangkok, Thailand | 2017 |
| Management of edentulous arches by Dr Santosa | The University of Adelaide | 2017 |
| Biennial Congress Australian New Zealand Prosthodontist (AANZP) | AANZP, Sydney, Australia | 2016 |

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|---|---|---|
| Restoration for posterior teeth by Dr Micheal Mandikos, Adelaide Australia | Australia Prosthodontic Society, Adelaide, Australia | 2015 |
| TMD- An evidence Based Approach from Clinicians perspective by Prof Klasser, The University of Adelaide | Australia Prosthodontic Society, Adelaide, Australia | 2014 |
| The Nuts and Bolts in being an effective Clinical Practice Tutor, Australia | The University of Adelaide, Australia | 2014 |
| A-P of composite resins by Dr Didier Dietschi, Queensland, Australia | Australia Prosthodontic Society, Adelaide, Australia | 2014 |
| Evolving techniques for anterior aesthetic implant site by Dr Manuv Suri | Australia Prosthodontic Society, Adelaide, Australia | 2014 |
| Leadership, especially as it builds a relationship with patients, staff, the university management and the profession: 27th July 2012. Prof. Johann De Vries,University of Adelaide | Faculty of Dentistry, UiTM | 2012 |
| Latest trends in simulation in restorative dentistry: Does it work? What is the future of?<br>impressions in the digital era? Prof. Johann De Vries,University of Adelaide | Faculty of Dentistry, UiTM | 2012 |
| GIP-ultra shorth, broad and hallow, a new advancement in implantology. 21st June 2012 | Faculty of Dentistry, UiTM | 2012 |
| Incorporating dslr camera in dental practice - creating textbook - like images, shortcuts, tips and tricks | Faculty of Dentistry, UiTM | 2012 |
| Minimal Intervention Dentistry (MID)-Management of caries lesion from the early spots to large cavities. 4th June 2012. Prof.Hien Ngo | Faculty of Dentistry, UM | 2012 |
| Insight to Life-like Polychromatic Restoration.16th June 2012. Dr Sony Burias | Faculty of Dentistry, UiTM | 2012 |
| 2nd Sabah Dental Congress 2011 Kota Kinabalu Sabah | Malaysian Dental Association | 2011 |
| Moderator in the 19th FDI/MDAScientific Convention - Aesthetics: Made Easy with Composites. UiTM, March 2011 | Malaysian Dental Association | 2011 |
| Sharpening Instrument and Root Debridement, UiTM, Feb 2011 | Faculty of Dentistry, UiTM | 2011 |
| “Creating Beautiful Smiles”, 3M Fixed Prosthodontic Competition,UKM, March 2011 | Faculty of Dentistry, UKM | 2011 |
| “Globalising New Age Dentistry”, MDA, Kuala Lumpur, Jan 2010 | Malaysian Dental Association | 2010 |

Table of Content

Screening 1

- Subject Information & Demographic Data
- Inclusion Criteria
- Exclusion Criteria
- Clinical Examination
- Intra-oral Examination

Screening 1.2

- Radiographic Report
- Conclusion the

Visit 1

Informed consent, Ios Scan(T0), Intraoral photo

Visit 2

- Implant placememt

Visit 3

- Postoperative Follow up

Visit 4.0

- Ios scan(T1), Time efficiency, OHIP,PROMS

Visit 5.0

- Ios scan (T2i,T2d), Delivery of implant crown, PESWES,Time efficiency,FIT, OHIP,PROMS
- Peri-implant tissue Assessment

Visit 6

- 12 months recall visit, PESWES, IOS (T3), OHIP, PROMS

Site ID _____ Subject ID _____ Subject initial _____

**Screening 1**

Visit: _____

**Subject Information & Demographic Data**

Gender : Male ☐ Female ☐

Date of birth : _____ / _____ / _____

Day Month Year

Ethnicity : Malay ☐ Chinese ☐ Indian ☐ Others ☐

Occupation :

- Manager, Professionals, Manager, Executive & Technician ☐
- Clerical & Service Wokers ☐
- Skilled Agricultural, Forestry, Livestock & Fishery Workers ☐
- Artisan ☐
- Cleaner, Janitor, Hawker etc ☐
- Armed Forces ☐
- Others (please specify) _____

Highest education level :

- No Formal Education ☐
- Primary Education ☐
- Secondary Education ☐
- Tertiary Education ☐
- Others (specify) _____

Monthly household income :

- <RM 4850 ☐
- RM 4850 – RM 10959 ☐
- RM 10959 – 15040 ☐
- >RM 15040 ☐

Site ID _____ Subject ID _____ Subject initial _____

**Screening 1.2 (Continued)**

| **Inclusion Criteria** | No | Yes |
|---|---|---|
| **A. General** | | |
| At least 18 years of age | ☐ | ☐ |
| Ability to understand and provide informed consent | ☐ | ☐ |
| Ability and willingness to comply with all study requirements to be evaluated for each study visit. | ☐ | ☐ |
| Adequate oral hygiene to allow for implant therapy consistent with standards of care. | ☐ | ☐ |
| Patients must be physically able to tolerate conventional surgical and restorative procedures | ☐ | ☐ |
| Healthy or having mild or controlled systemic disease | ☐ | ☐ |
| **B. Specific** | | |
| One tooth in the posterior mandible (first or second molar) planned to be restored with a dental implant as determined by the patient's dental provider | ☐ | ☐ |
| Adequate mesiodistal dimension (≥8 mm) | ☐ | ☐ |
| Intact adjacent teeth on both sides with existing opposing tooth condition | ☐ | ☐ |
| Good oral hygiene, plaque score <25% bpe1 | ☐ | ☐ |
| Adequate keratinized mucosa width (kmw) minimum 6 mm at the edentulous site | ☐ | ☐ |
| Adequate interoccusal distance (crown height space) of at least 6mm measured from alveolar crest to the occlusal table. | ☐ | ☐ |

*** To exclude subject with ONE or more "No" in the criteria above**

**Exclusion Criteria**

**A. Medical history**

| | | |
|---|---|---|
| ASA 3 and above (Uncontrolled DM, HTN | ☐ | ☐ |
| History of HIV infection, Hepatitis B or C | ☐ | ☐ |
| Current hematological disorder or warfarin (or similar) | ☐ | ☐ |
| History of disease that affects bone metabolism, congenital connective tissue disorders (e.g., osteogenesis imperfecta), or Paget's disease | ☐ | ☐ |
| On medications / treatment known to have an effect on bone turnover, including thiazide diuretics, calcitonin, systemic steroids, bisphosphonates, vitamin D (>800 IU/day), estrogen or progesterone therapy. | ☐ | ☐ |
| Severe occlusal discrepancy | ☐ | ☐ |
| In need of bone grafting at the site of intended implant site | ☐ | ☐ |
| History of malignancy, radiotheraphy or chemotheraphy | ☐ | ☐ |
| Physical or mental handicaps that would interfere with patient's ability to exercise good oral hygiene on a regular basis | ☐ | ☐ |
| History of usage of any investigational drug/device within the 30 days prior to implant surgery. | ☐ | ☐ |
| Currently pregnant (for female subject) | ☐ | ☐ |
| History of tobacco use in the past 5 years of more than 10 cigarettes per day/ tobacco chewing | ☐ | ☐ |

*** To exclude subject with ONE or more "yes" in the criteria above**

Site ID _____ Subject ID _____ Subject initial _____

**Screening 1 (Continued)**

**Intraoral Examination**

| | | | | | |
|---|---|---|---|---|---|
| Oral Hygiene | Good | ☐ | Fair | ☐ | Poor |
| Limitation of mouth opening | yes | ☐ | no | ☐ | Specify: |
| TMJ Disorder | yes | ☐ | no | ☐ | |

**PREPOSITION IMPLANT SITE (Examination of adjacent teeth)**

Missing tooth _____

| | Mesial tooth ( ) | Distal tooth ( ) |
|---|---|---|
| Gingiva biotype | ☐ Thick | ☐ Thick |
| | ☐ Thin | ☐ Thin |

| | | | | |
|---|---|---|---|---|
| Probing Depth > 3 mm | No | ☐ | Yes | ☐ |
| Caries | No | ☐ | Yes | ☐ |
| Endodontic Disease | No | ☐ | Yes | ☐ |
| Tooth mobility (If yes, please tick of any) | No | ☐ | Yes | ☐ |

| | | | |
|---|---|---|---|
| ☐ | Grade I | ☐ | Grade I |
| ☐ | Grade II | ☐ | Grade II |
| ☐ | Grade III | ☐ | Grade III |

Occlusion:

Tooth contact during excursive movement

(Rt) ws

nws

(Lt) ws

nws

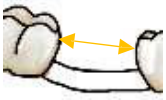
Protrusive

Restorative Space (Implant Area):

Restorative space: _____ mm

Vertical height at least 6 mm

Mesio-distal width: _____ mm



8-12 mm

Horizontal Width: Adequate Inadequate *please tick any

**Radiographic Report**

Visit Date: _____

| **CBCT:** | No | Yes |
|---|---|---|
| Adequate bone volume to accommodate the planned endosseous dental implant placement of 5.5 mm in diameter and 10 mm in length | ☐ | ☐ |

Other comment:

Length: _____

Width : _____

| **Conclusion of The Eligibility**<br>This patient complies with all inclusion and exclusion criteria:<br>*Proceed to Visit 1 Day 0* | No | Yes |
|---|---|---|
| | ☐ | ☐ |

Principal Investigator's Signature:

Principal Investigator's Name:_____

Date:_____

| **Procedures Milestone** | | |
|---|---|---|
| Name of Procedure | Date | Schedule |
| Screening. Patient recruitment,CBCT | | |
| Visit 1: Informed consent, IOS scan ($T_O$), Intraoral Photo, OHIP,PROMS (Baseline) | | |
| Visit 2: Implant placement,ISQ,X Ray,photo | | |
| Visit 3: Postoperative Review | | |
| Visit 4: Digital Impression (IOST1) OHIP, PROMS | | |
| Visit 5: Digital Impression (IOST2i.2d), Delivery of implant crown,PESWES | | |
| Visit 6: 12 months recall visit, PESWES, IOS (T3) OHIP,PROMS | | |

Site ID _____ Subject ID _____ Subject initial _____

Visit 1

Visit date: _____

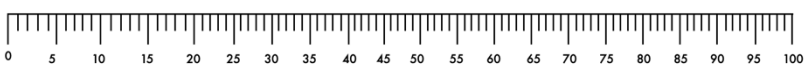
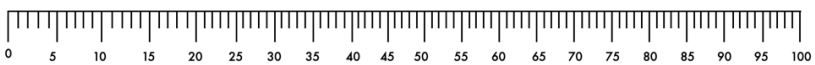
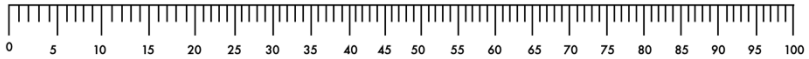
Informed consent: Y/N

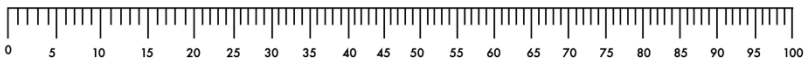
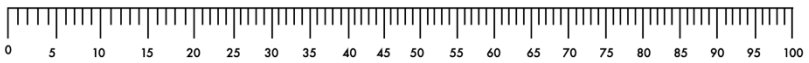
IOS SCAN ($T_0$): Y/N

| Visit 1 : OHIP | | | | | |
|---|---|---|---|---|---|
| Scoring | 1 | 2 | 3 | 4 | 5 |
| | Strongly agree/sangat setuju | Agree/Setuju | Undecided/Neutralatau tidak berpendapat | Disagree/kurang setuju | Strongly disagree |

| No | Item | Score | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| I | Functional Limitation | | | | | |
| 1 | Have you ever experienced difficulty chewing any food because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengalami kesukaran menguyah sebarang makanan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you felt problems related to your teeth, mouth or implant cause bad breath?<br>*Pernahkah anda merasakan masalah gigi, mulut atau implant anda menyebabkan nafas anda berbau?* | | | | | |
| II | Physical pain | | | | | |
| 1 | Have you experienced discomfort eating any food because of problems with your teeth, mouth or implant<br>*Pernahkah anda mengalami rasa tidak selesa untuk makan sebarang makanan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you experienced ulcers in your mouth?<br>*Pernahkah anda mengalami tompok-tompok putih pedih (ulser) di dalam mulut* | | | | | |
| III | Psychological comfort | | | | | |
| 1. | Have you felt discomfort due to food getting stuck between your teeth or implant<br>*Pernahkah anda merasa tidak selesa disebabkan makanan terlekat di celah gigi atau implant anda?* | | | | | |
| 2. | Have you felt shy because of problems with your teeth, mouth or implant?<br>*Pernahkah anda merasa malu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| IV | Physical disability | | | | | |
| 1 | Have you avoided eating certain foods because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada memakan makanan tertentu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | Have you avoided smiling because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada senyum disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| V | Psychological disability | | | | | |
| 1. | Has your sleep been disturbed because of problems with your teeth, mouth or implant?<br>Pernahkah anda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau implant anda | | | | | |
| 2. | Has your concentration been disturbed by problem with your teeth, mouth or implant?<br>*Pernahkah tumpuan anda terganggu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| VI | Social disability | | | | | |
| 1. | Have you avoided going out because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you experienced problems in carrying out your daily activities because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengalami masalah untuk menjalankan kerja-kerja harian anda disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| VII | Handicap | | | | | |
| 1 | Have you had to spend a lot of money due to problems with your teeth, mouth, or *implant?*<br>*Pernahkah anda terpaksa mengeluarkan perbelanjaan yang tinggi disebabkan masalah gigi, mulut, atau implant anda?* | | | | | |
| 2. | Have you felt less confident of yourself due to problems with your teeth, mouth, or implant?<br>*Pernahkah anda merasa kurang yaking dengan diri anda disebabkan masalah gigi, multu atau implant anda?* | | | | | |

| Visit 1: Patient reported outcome measure (PROMS) with VAS | | |
|---|---|---|
| VAS questions (Unsatisfied to Fully Satisfied ( 0-100) | | Vas ruler |
| 1 | **Comfort during impression taking**<br>How comfortable was the impression-taking process |  <br>Extremely uncomfortable Extremely comfortable |
| 2 | **Perceived duration of the procedure**<br>How acceptable was the duration of the procedure |  <br>Far too long perfectly acceptable |
| 3 | **Convenience of the procedure**<br>How convenient and easy was the procedure for you |  <br>extremely inconvenient extremely convenient |

| | | |
|---|---|---|
| 4. | **Overall satisfaction**<br>How satisfied are you overall with the impression method used? |  <br><br>extremely dissatisfied extremely satisfied |
| 5. | **Willingness to undergo the same procedure again**<br>Would you choose to undergo the same procedure in the future |  <br><br>Definitely not yes definitely |

Site ID _____ Subject ID _____ Subject initial _____

Visit 2

**Implant Placement**

Visit Date: _____

**Vital Sign**

BP : _____ / _____ mm/hg

Pulse rate : _____ beats/min

Respiratory rate : _____ breaths/min

Insertion Torque: _____

Implant Stability (ISQ): _____

Crestal Bone Level: _____

_____

Medication prescribed: _____

_____

_____

_____

_____

_____

_____

_____

| **Post-surgical exclusion criteria** | No | Yes |
|---|---|---|
| Lack of implant primary stability | ☐ | ☐ |
| Inappropriate implant position for prosthetic requirements. Major simultaneous augmentation procedures at surgery. | ☐ | ☐ |

*** To exclude subject with ONE or more "yes" in the criteria above**

Adverse Event (if present)

Finding:

_____

_____

_____

_____

_____

Management:

_____

_____

_____

_____

_____

Discontinuation/ Withdrawal No ☐ Yes ☐

Principal Investigator's Signature:

Principal Investigator's Name:_____

Date:_____

Site ID _____ Subject ID _____ Subject initial _____

Visit 3

**Postoperative Review**

Visit Date: _____

Chiefs complain:

Findings:

Procedures:

Adverse Event (if any:

Management:

Discontinuation/ Withdrawal No Yes

Principal Investigator's Signature:

Principal Investigator's Name:_____

Site ID _____ Subject ID _____ Subject initial _____

Visit 4

**Digital Impression IOS SCAN ($T_1$)**

Visit Date: _____

IOS SCAN ($T_1$) : Y/N

Chiefs complain:

Findings:

Procedures:

| Visit 4: TIME EFFICIENCY | | | |
|---|---|---|---|
| Digital Impression taking | | Time (minutes) | |
| | | SHA/SCAN | AHA |
| 1. | Removal of healing abutment + insertion of scan body | | |
| 2. | Intraoral scan process with scan body/AHA<br>Opposite arch<br>Maxillomandibular relationship record | | |
| 3. | Removal of scan body + insertion of healing cap | | |
| | Total | | |

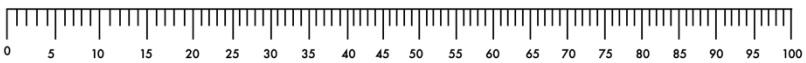
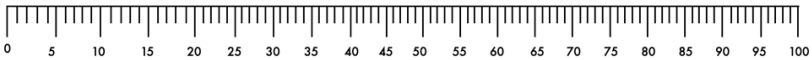
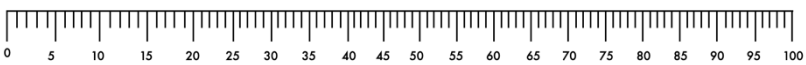
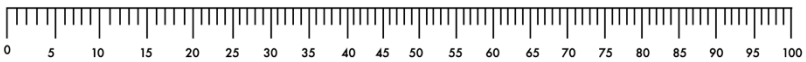
Site ID _____ Subject ID _____ Subject initial _____

| Visit 4 : OHIP | | | | | |
|---|---|---|---|---|---|
| Scoring | 1 | 2 | 3 | 4 | 5 |
| | Strongly agree/sangat setuju | Agree/Setuju | Undecided/Neutralatau tidak berpendapat | Disagree/kurang setuju | Strongly disagree |

| No | Item | Score | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| I | Functional Limitation | | | | | |
| 1 | Have you ever experienced difficulty chewing any food because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengalami kesukaran menguyah sebarang makanan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you felt problems related to your teeth, mouth or implant cause bad breath?<br>*Pernahkah anda merasakan masalah gigi, mulut atau implant anda menyebabkan nafas anda berbau?* | | | | | |
| II | Physical pain | | | | | |
| 1 | Have you experienced discomfort eating any food because of problems with your teeth, mouth or implant<br>*Pernahkah anda mengalami rasa tidak selesa untuk makan sebarang makanan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you experienced ulcers in your mouth?<br>*Pernahkah anda mengalami tompok-tompok putih pedih (ulser) di dalam mulut* | | | | | |
| III | Psychological comfort | | | | | |
| 1. | Have you felt discomfort due to food getting stuck between your teeth or implant<br>*Pernahkah anda merasa tidak selesa disebabkan makanan terlekat di celah gigi atau implant anda?* | | | | | |
| 2. | Have you felt shy because of problems with your teeth, mouth or implant?<br>*Pernahkah anda merasa malu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| IV | Physical disability | | | | | |
| 1 | Have you avoided eating certain foods because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada memakan makanan tertentu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2 | Have you avoided smiling because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada senyum disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| V | Psychological disability | | | | | |

Site ID Subject ID Subject Initial

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Has your sleep been disturbed because of problems with your teeth, mouth or implant?<br>Pernahkah anda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau implant anda | | | | | |
| 2. | Has your concentration been disturbed by problem with your teeth, mouth or implant?<br>*Pernahkah tumpuan anda terganggu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| VI | Social disability | | | | | |
| 1. | Have you avoided going out because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you experienced problems in carrying out your daily activities because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengalami masalah untuk menjalankan kerja-kerja harian anda disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| VII | Handicap | | | | | |
| 1 | Have you had to spend a lot of money due to problems with your teeth, mouth, or *implant?*<br>*Pernahkah anda terpaksa mengeluarkan perbelanjaan yang tinggi disebabkan masalah gigi, mulut, atau implant anda?* | | | | | |
| 2. | Have you felt less confident of yourself due to problems with your teeth, mouth, or implant?<br>*Pernahkah anda merasa kurang yaking dengan diri anda disebabkan masalah gigi, multu atau implant anda?* | | | | | |

| Visit 4: Patient reported outcome measure (PROMS) with VAS | | |
|---|---|---|
| VAS questions (Unsatisfied to Fully Satisfied ( 0-100) | | Vas ruler |
| 1 | **Comfort during impression taking**<br>How comfortable was the impression-taking process |  <br>Extremely uncomfortable Extremely comfortable |
| 2 | **Perceived duration of the procedure**<br>How acceptable was the duration of the procedure |  <br>Far too long perfectly acceptable |
| 3 | **Convenience of the procedure**<br>How convenient and easy was the procedure for you |  <br>extremely inconvenient extremely convenient |
| 4. | **Overall satisfaction**<br>How satisfied are you overall with the impression method used? |  <br>extremely dissatisfied extremely satisfied |

Site ID _____ Subject ID _____ Subject initial _____

| | | |
|---|---|---|
| 5. | **Willingness to undergo the same procedure again** Would you choose to undergo the same procedure in the future |  Definitely not yes definitely |

Discontinuation/ Withdrawal No ☐ Yes ☐

Principal Investigator's Signature:

Principal Investigator's Name:_____

Date**:**_____

Site ID Subject ID Subject Initial

Visit 5

**Delivery of implant crown, IOS (T2i,T2d), PESWES,OHIP,PROMS**

Visit Date: _____

IOS SCAN (T2i,) : Y/N
IOS SCAN (T2d) : Y/N

Chiefs complain:

Findings:

Procedures:

Adverse Event (if any:

Management:

Site ID _____ Subject ID _____ Subject Initial _____

| Visit 5 : Pink Esthetic score (PES), White Esthetic score (WES) | | | |
|---|---|---|---|
| PES | 0 | 1 | 2 |
| Mesial papilla | Absent | Incomplete | Complete |
| Distal Papilla | Absent | Incomplete | Complete |
| Level of soft tissue margin | Major discrepancy>2mm | Minor discrepancy <2mm | No discrepancy <2mm |
| Soft tissue contour | Unnatural | Fairly natural | Natural |
| Alveolar process deficiency | Obvious | Slight | None |
| Soft tissue color | Obvious difference | Moderate Difference | No difference |
| Soft tissue texture | Obvious difference | Moderate Difference | No difference |
| WES | 0 | 1 | 2 |
| Tooth form | Major discrepancy | Minor Discrepancy | No discrepancy |
| Tooth contour | Major discrepancy | Minor Discrepancy | No discrepancy |
| Colour | Major discrepancy | Minor Discrepancy | No discrepancy |
| Surface texture | Major discrepancy | Minor Discrepancy | No discrepancy |
| Translucency | Major discrepancy | Minor Discrepancy | No discrepancy |

Peri-implant tissue position

| | | | |
|---|---|---|---|
| General Peri-implant mucosal condition | Normal | Erythematous | Swelling |
| Inflammation level | No | Yes | Mild (pink)<br>Moderate (purple pink)<br>Severe (magenta red) |
| Bleeding on probing | No | Yes | Please specifiy area |
| Suppuration | No | Yes | |
| Dehiscence | No | Yes | |
| Others: | | | |

Site ID _____ Subject ID _____ Subject Initial _____

| Visit 5: TIME EFFICIENCY | | | |
|---|---|---|---|
| Crown delivery | | Time (minutes) | |
| | | SHA/SCAN | AHA |
| 1. | Removal of healing abutment | | |
| 2. | Try in Monolithic zirconia crown<br>Adjustment of interproximal<br>Adjustment occlusal<br>Screw retention closure and access hole | | |
| | Total | | |

| Visit 5: implant crown fit | | | |
|---|---|---|---|
| Parameters | Score 1: clinically excellent | Score 2: clinically acceptable | Score 3: correction needed |
| Marginal Fit | No clinically detectable gap | Detectable gap<150 um | Overhanging margin or gap>150 m (making possible to insert explorer tip into gap) |
| Proximal contact | Dental floss could onlv be passed through contact area under pressure | Slightly weak or tight (dental floss could still be passed with slight snap effect or slight tear) | Visible open contact or too tight to avoid crown insertion |
| Occlusal contact | No need for occlusal adjustments | Minor occlusal adjustments needed | Major adjustments needed |
| Crown morphology | Correct tooth form with clear characteristics of cusps, ridges, pits, and fissures | Correct form without clear characteristics | Incorrect tooth form |

| Visit 5 : OHIP | | | | | |
|---|---|---|---|---|---|
| Scoring | 1 | 2 | 3 | 4 | 5 |
| | Strongly agree/sangat setuju | Agree/Setuju | Undecided/Neutralatau tidak berpendapat | Disagree/kurang setuju | Strongly disagree |

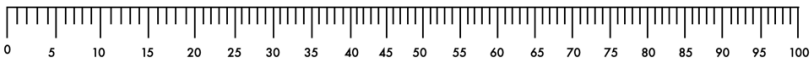
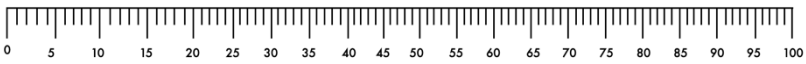
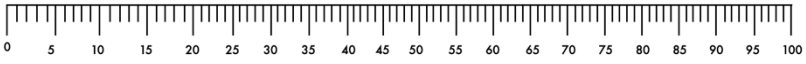
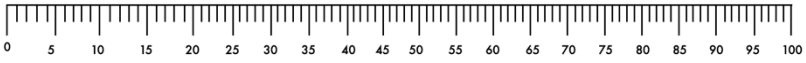
| No | Item | Score | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| I | Functional Limitation | | | | | |
| 1 | Have you ever experienced difficulty chewing any food because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengalami kesukaran menguyah sebarang makanan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you felt problems related to your teeth, mouth or implant cause bad breath?<br>*Pernahkah anda merasakan masalah gigi, mulut atau implant anda menyebabkan nafas anda berbau?* | | | | | |
| II | Physical pain | | | | | |

Site ID _____ Subject ID _____ Subject Initial _____

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Have you experienced discomfort eating any food because of problems with your teeth, mouth or implant<br>*Pernahkah anda mengalami rasa tidak selesa untuk makan sebarang makanan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you experienced ulcers in your mouth?<br>*Pernahkah anda mengalami tompok-tompok putih pedih (ulser) di dalam mulut* | | | | | |
| III | Psychological comfort | | | | | |
| 1. | Have you felt discomfort due to food getting stuck between your teeth or implant<br>*Pernahkah anda merasa tidak selesa disebabkan makanan terlekat di celah gigi atau implant anda?* | | | | | |
| 2. | Have you felt shy because of problems with your teeth, mouth or implant?<br>*Pernahkah anda merasa malu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| IV | Physical disability | | | | | |
| 1 | Have you avoided eating certain foods because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada memakan makanan tertentu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2 | Have you avoided smiling because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada senyum disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| V | Psychological disability | | | | | |
| 1. | Has your sleep been disturbed because of problems with your teeth, mouth or implant?<br>Pernahkah anda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau implant anda | | | | | |
| 2. | Has your concentration been disturbed by problem with your teeth, mouth or implant?<br>*Pernahkah tumpuan anda terganggu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| VI | Social disability | | | | | |
| 1. | Have you avoided going out because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you experienced problems in carrying out your daily activities because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengalami masalah untuk menjalankan kerja-kerja harian anda disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| VII | Handicap | | | | | |
| 1 | Have you had to spend a lot of money due to problems with your teeth, mouth, or *implant?*<br>*Pernahkah anda terpaksa mengeluarkan perbelanjaan yang tinggi disebabkan masalah gigi, mulut, atau implant anda?* | | | | | |

Site ID Subject ID Subject Initial

| | | | | | | |
|---|---|---|---|---|---|---|
| 2. | Have you felt less confident of yourself due to problems with your teeth, mouth, or implant?<br>*Pernahkah anda merasa kurang yaking dengan diri anda disebabkan masalah gigi, multu atau implant anda?* | | | | | |

| Visit 5: Patient reported outcome measure (PROMS) with VAS | | |
|---|---|---|
| VAS questions (Unsatisfied to Fully Satisfied ( 0-100) | | Vas ruler |
| 1 | **Comfort during impression taking**<br>How comfortable was the impression-taking process |  <br>Extremely uncomfortable Extremely comfortable |
| 2 | **Perceived duration of the procedure**<br>How acceptable was the duration of the procedure |  <br>Far too long perfectly acceptable |
| 3 | **Convenience of the procedure**<br>How convenient and easy was the procedure for you |  <br>extremely inconvenient extremely convenient |
| 4. | **Overall satisfaction**<br>How satisfied are you overall with the impression method used? |  <br>extremely dissatisfied extremely satisfied |
| 5. | **Willingness to undergo the same procedure again**<br>Would you choose to undergo the same procedure in the future |  <br>Definitely not definitely yes |

Discontinuation/ Withdrawal No ☐ Yes ☐

Principal Investigator's Signature:

Principal Investigator's Name:_____

Date : _____

Site ID _____ Subject ID _____ Subject Initial _____

Visit 6

**12months recall visits, PESWES,IOS(T3).OHIP,PROMS**

Visit Date: _____

IOS SCAN (T3,) : Y/N

Chiefs complain:

Findings:

Procedures:

Site ID Subject ID Subject Initial

| Visit 6 : Pink Esthetic score (PES), White Esthetic score (WES) | | | |
|---|---|---|---|
| PES | 0 | 1 | 2 |
| Mesial papilla | Absent | Incomplete | Complete |
| Distal Papilla | Absent | Incomplete | Complete |
| Level of soft tissue margin | Major discrepancy>2mm | Minor discrepancy <2mm | No discrepancy <2mm |
| Soft tissue contour | Unnatural | Fairly natural | Natural |
| Alveolar process deficiency | Obvious | Slight | None |
| Soft tissue color | Obvious difference | Moderate Difference | No difference |
| Soft tissue texture | Obvious difference | Moderate Difference | No difference |
| WES | 0 | 1 | 2 |
| Tooth form | Major discrepancy | Minor Discrepancy | No discrepancy |
| Tooth contour | Major discrepancy | Minor Discrepancy | No discrepancy |
| Colour | Major discrepancy | Minor Discrepancy | No discrepancy |
| Surface texture | Major discrepancy | Minor Discrepancy | No discrepancy |
| Translucency | Major discrepancy | Minor Discrepancy | No discrepancy |

Peri-implant tissue position

| | | | |
|---|---|---|---|
| General Peri-implant mucosal condition | Normal | Erythematous | Swelling |
| Inflammation level | No | Yes | Mild (pink)<br>Moderate (purple pink)<br>Severe (magenta red) |
| Bleeding on probing | No | Yes | Please specifiy area |
| Suppuration | No | Yes | |
| Dehiscence | No | Yes | |
| Others: | | | |

Site ID _____ Subject ID _____ Subject Initial _____

Technical Complications:

Abutment Screw Loosening: ☐ No ☐ Yes

Loss of Retention (Crown): ☐ No ☐ Yes

Specify _____

Fracture of Crown: ☐ No ☐ Yes

Specify _____

Fracture of Abutment: ☐ No ☐ Yes

Specify _____

Fracture of Screw: ☐ No ☐ Yes

Specify _____

Implant Fracture: ☐ No ☐ Yes

Specify _____

| Visit 6 : OHIP | | | | | |
|---|---|---|---|---|---|
| Scoring | 1 | 2 | 3 | 4 | 5 |
| | Strongly agree/sangat setuju | Agree/Setuju | Undecided/Neutralatau tidak berpendapat | Disagree/kurang setuju | Strongly disagree |

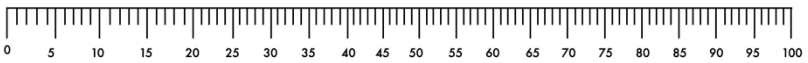
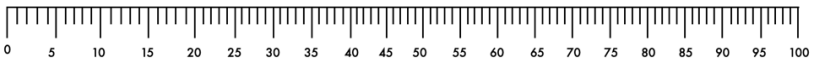
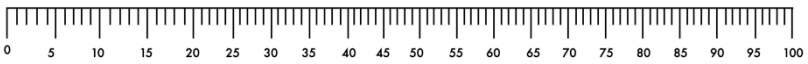
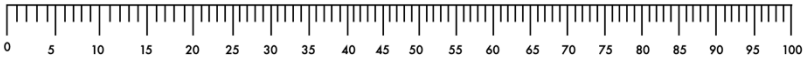
| No | Item | Score | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| I | Functional Limitation | | | | | |
| 1 | Have you ever experienced difficulty chewing any food because of problems with your teeth, mouth or implant? *Pernahkah anda mengalami kesukaran menguyah sebarang makanan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you felt problems related to your teeth, mouth or implant cause bad breath? *Pernahkah anda merasakan masalah gigi, mulut atau implant anda menyebabkan nafas anda berbau?* | | | | | |
| II | Physical pain | | | | | |

Site ID _____ Subject ID _____ Subject Initial _____

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Have you experienced discomfort eating any food because of problems with your teeth, mouth or implant<br>*Pernahkah anda mengalami rasa tidak selesa untuk makan sebarang makanan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you experienced ulcers in your mouth?<br>*Pernahkah anda mengalami tompok-tompok putih pedih (ulser) di dalam mulut* | | | | | |
| III | Psychological comfort | | | | | |
| 1. | Have you felt discomfort due to food getting stuck between your teeth or implant<br>*Pernahkah anda merasa tidak selesa disebabkan makanan terlekat di celah gigi atau implant anda?* | | | | | |
| 2. | Have you felt shy because of problems with your teeth, mouth or implant?<br>*Pernahkah anda merasa malu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| IV | Physical disability | | | | | |
| 1 | Have you avoided eating certain foods because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada memakan makanan tertentu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2 | Have you avoided smiling because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada senyum disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| V | Psychological disability | | | | | |
| 1. | Has your sleep been disturbed because of problems with your teeth, mouth or implant?<br>Pernahkah anda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau implant anda | | | | | |
| 2. | Has your concentration been disturbed by problem with your teeth, mouth or implant?<br>*Pernahkah tumpuan anda terganggu disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| VI | Social disability | | | | | |
| 1. | Have you avoided going out because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| 2. | Have you experienced problems in carrying out your daily activities because of problems with your teeth, mouth or implant?<br>*Pernahkah anda mengalami masalah untuk menjalankan kerja-kerja harian anda disebabkan masalah gigi, mulut atau implant anda?* | | | | | |
| VII | Handicap | | | | | |
| 1 | Have you had to spend a lot of money due to problems with your teeth, mouth, or *implant?*<br>*Pernahkah anda terpaksa mengeluarkan perbelanjaan yang tinggi disebabkan masalah gigi, mulut, atau implant anda?* | | | | | |

Site ID _____ Subject ID _____ Subject Initial _____

| | | | | | | |
|---|---|---|---|---|---|---|
| 2. | Have you felt less confident of yourself due to problems with your teeth, mouth, or implant?<br>*Pernahkah anda merasa kurang yaking dengan diri anda disebabkan masalah gigi, multu atau implant anda?* | | | | | |

| Visit 5: Patient reported outcome measure (PROMS) with VAS | | |
|---|---|---|
| VAS questions (Unsatisfied to Fully Satisfied ( 0-100) | | Vas ruler |
| 1 | **Comfort during impression taking**<br>How comfortable was the impression-taking process |  <br>Extremely uncomfortable Extremely comfortable |
| 2 | **Perceived duration of the procedure**<br>How acceptable was the duration of the procedure |  <br>Far too long perfectly acceptable |
| 3 | **Convenience of the procedure**<br>How convenient and easy was the procedure for you |  <br>extremely inconvenient extremely convenient |
| 4. | **Overall satisfaction**<br>How satisfied are you overall with the impression method used? |  <br>extremely dissatisfied extremely satisfied |
| 5. | **Willingness to undergo the same procedure again**<br>Would you choose to undergo the same procedure in the future |  <br>Definitely not definitely yes |

Discontinuation/ Withdrawal ☐ No ☐ Yes

Principal Investigator's Signature:

Principal Investigator's Name:_____

Date: _____

MAKLUMAT PROJEK PENYELIDIKAN UNTUK PESERTA

Tajuk Kajian: **Kajian Klinikal Prospektif: Perbandingan Kaedah Digital Menggunakan Scan Body Standard dan Abutmen Penyembuhan Anatomi (PEEK) untuk Rawatan Implant menggantikan gigi geraham**
Nama penaja: **Institute Straumann AG, Basel, Switzerland**
Nama Penyelidik: **Dr Nur Hafizah Kamar Affendi**
Nama pusat kajian: **Fakulti Pergigian, Universiti Teknologi MARA, Artius Dental Specialist Centre, Kuala Lumpur**
Nama subjek: _____
No Kad Pengenalan Subjek: _____

**Tajuk Kajian**
Kajian Klinikal Prospektif: Perbandingan Kaedah Digital Menggunakan Scan Body Standard dan Abutmen Penyembuhan Anatomi (PEEK) untuk Rawatan Implant menggantikan gigi geraham

**Pengenalan**
Anda dijemput untuk mengambil bahagian dalam satu kajian klinikal yang dijalankan oleh pasukan pakar pergigian dari Fakulti Pergigian, Universiti Teknologi MARA. Kajian ini bertujuan untuk membandingkan hasil dua kaedah digital dalam penyediaan korona implan bagi gigi geraham bawah yang hilang. Sistem implan yang digunakan adalah Implan Straumann Bone Level (5.5 x 10 mm). Semua korona akan direka dan dihasilkan sepenuhnya menggunakan teknologi digital CAD/CAM. Sekiranya anda bersetuju untuk menyertai kajian ini, anda akan melalui 6 lawatan klinikal dalam tempoh 12 bulan yang merangkumi prosedur pemasangan implan, pemasangan korona, serta lawatan susulan Setiap lawatan akan melibatkan pemeriksaan klinikal, pengambilan X-ray, serta soal selidik berkaitan fungsi mulut, tahap keselesaan, dan kualiti hidup anda.

**Tujuan Kajian**

Kajian ini bertujuan untuk menilai dan membandingkan keberkesanan dua jenis aliran kerja digital untuk penyediaan korona gigi implan. Peserta akan dibahagikan secara rawak kepada dua kumpulan, iaitu satu kumpulan akan menerima rawatan menggunakan scan body standard dan satu lagi kumpulan akan menerima rawatan menggunakan abutmen penyembuhan anatomi (PEEK). Keputusan kajian ini dijangka dapat memberi maklumat kepada klinikal mengenai kesan aliran kerja ini terhadap tisu gingiva dan ketepatan korona implan yang dihasilkan.Hasil kajian ini dijangka dapat membantu doktor gigi memilih rawatan yang sesuai dan berkesan.

**Penglibatan dalam kajian**
Jika anda layak untuk kajian ini, anda akan menghadiri satu lawatan saringan (1–30 hari sebelum lawatan asas), di mana doktor akan menyemak sejarah perubatan dan pergigian anda, menjalankan pemeriksaan klinikal dan radiografik, serta mengambil imbasan dan gambar digital. Anda juga akan melengkapkan soal selidik kesihatan mulut (OHIP) dan kadar kepuasan visual (VAS)
Kajian ini melibatkan enam lawatan dalam tempoh kira-kira 12 bulan:

- Lawatan 1: Persetujuan Bertulis, Imbasan Intraoral, Soal Selidik
- Lawatan 2: Penempatan Implan, Nilai ISQ, X-ray, Foto
- Lawatan 3: lawatan susulan selepas implan
- Lawatan 4: Imbasan Intraoral, Soal Selidik
- Lawatan 5: Imbasan Intraoral, Pemasangan Korona Implan, Soal Selidik
- Lawatan 6: Lawatan Ulangan pada 12 Bulan

**Tanggungjawab Peserta dalam kajian ini**

Penyertaan anda dalam kajian ini amat dihargai. Adalah penting untuk anda menjawab semua soalan yang dikemukakan oleh pasukan kajian dengan jujur dan lengkap. Jika terdapat sebarang perubahan pada keadaan kesihatan atau situasi anda sepanjang tempoh kajian, anda mesti memaklumkan kepada doktor kajian dengan segera. Terdapat beberapa jenis ubat yang tidak boleh diambil semasa anda menyertai kajian ini. Doktor akan berbincang dengan anda mengenai senarai ubat tersebut. Anda tidak boleh mengambil sebarang ubat lain tanpa berunding terlebih dahulu dengan doktor kajian. Sekiranya anda membuat sebarang perubahan pada rawatan yang sedang diambil termasuk ubat yang telah lama digunakan anda mesti memaklumkannya kepada doktor kajian secepat mungkin.

**Faedah**

Pembedahan implan pergigian yang dijalankan dalam kajian ini boleh memberikan beberapa manfaat, termasuk:

a) Meningkatkan estetika (penampilan gigi dan senyuman)
b) Meningkatkan pertuturan
c) Memberikan keselesaan yang lebih baik
d) Meningkatkan kecekapan mengunyah
e) Meningkatkan kesihatan mulut secara keseluruhan
f) Implan sangat tahan lama dan boleh bertahan untuk tempoh yang panjang, bertahun-tahun lamanya

**Risiko**

Seperti mana-mana prosedur pembedahan, penempatan implan pergigian melibatkan beberapa risiko. Walaupun komplikasi jarang berlaku, ia biasanya bersifat ringan dan boleh dirawat dengan mudah. Risiko-risiko yang mungkin termasuk:

- Jangkitan pada kawasan implan
- Kecederaan atau kerosakan pada struktur sekeliling seperti gigi bersebelahan atau salur darah
- Kerosakan saraf**,** yang boleh menyebabkan kesakitan, kebas, atau rasa menyucuk pada gigi semula jadi, gusi, bibir atau dagu
- Reaksi alahan atau hipersensitiviti terhadap bahan implan, terutamanya aloi titanium atau aloi nikel-titanium

Sekiranya anda mempunyai sejarah alahan terhadap bahan seperti titanium atau nikel, anda tidak digalakkan menyertai kajian ini.

**Bagaimana jika saya cedera semasa kajian ini**
Sekiranya terdapat kerosakan atau kecederaan yang berlaku kepada anda berkaitan dengan implan gigi yang diselidiki atau akibat dari penyertaan dalam penyelidikan ini, Penaja akan membayar rawatan yang susulan yang perlu. Walaubagaimanapun, Penaja tidak akan bertanggungjawab untuk perbelanjaan perubatan yang diakibatkan dari kondisi kesihatan yang memang sudah ada sebelumnya, sebarang penyakit dasar yang tidak berkaitan, sebarang proses rawatan semasa yang tidak berkaitan, kelalaian atau salah laku anda yang disengajakan, kecuaian atau salah laku doktor bertanggungjawab anda atau lokasi kajian atau pihak ketiga.

**Apakah jenis rawatan yang akan saya perolehi selepas menyertai kajian ini?**
Samaada anda menghabiskan kajian ini atau menarik diri lebih awal, doktor kajian anda akan membincangkan rawatan alternatif yang terbaik untuk anda. Anda dinasihatkan untuk mengunjungi klinik pergigian untuk pemeriksaan dan pemeliharaan berkala selepas tempoh kajian. Waiau bagaimanapun, kos penyelenggaraan selepas tempoh kajian ditanggung oleh peserta.
**Adakah saya perlu mengambil bahagian?**
Penyertaan adalah secara sukarela. Jika anda bersetuju untuk mengambil bahagian, maka anda akan diminta untuk menandatangani "Borang Keizinan". Anda juga akan diberi satu Salinan Borang Maklumat Projek ini. Anda berhak menolak tawaran penyertaan ini atau menarik diri daripada penyelidikan ini pada bila-bila masa tanpa sebarang penalti.

**Data dan kerahsiaan**
Segala data peribadi yang dikumpulkan sepanjang kajian ini akan dikendalikan dengan kerahsiaan yang paling ketat oleh doktor kajian, pemantau kajian, penaja, dan Jawatankuasa Etika Bebas. Identiti anda tidak akan didedahkan dalam sebarang laporan, penerbitan atau pembentangan yang dihasilkan daripada kajian ini. Nama anda tidak akan digunakan dalam dokumen kajian; sebaliknya, anda akan diberikan nombor pengenalan khas yang akan digunakan sepanjang kajian.Akses kepada data anda akan dihadkan secara ketat. Tiada maklumat peribadi akan didedahkan kepada pihak ketiga tanpa kebenaran anda, kecuali kepada individu yang diberi kuasa untuk menyelia kajian ini, termasuk kakitangan penaja (seperti pemantau dan juruaudit), pihak berkuasa pengawalseliaan, dan Jawatankuasa Etika Bebas. Individu-individu ini mungkin akan mengakses Borang Laporan Kajian (Case Report Form, CRF) dan dokumen sumber lain sebagai sebahagian daripada tanggungjawab pemantauan dan jaminan kualiti. Doktor kajian bertanggungjawab untuk memastikan semua data peribadi anda kekal selamat dan dirahsiakan sepanjang tempoh kajian dan selepas kajian selesai.

**Pembayaran dan pampasan**

Kesemua kos untuk kajian ini adalah ditaja oleh Straumann Investigator Initiated Study dan anda tidak perlu membayar untuk mengambil bahagian dalam kajian ini. Jika anda memerlukan rawatan lain yang tidak berkaitan dengan kajian ini, kos rawatan perlu ditangggung mengikut kadar bayaran klinik.Siapa yang anda boleh bertanya tentang kajian ini?Jika anda mempunyai sebarang pertanyaan, anda boleh menghubungi

Ketua projek

Dr Nur Hafizah Kamar Affendi
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Institute of Pathology, Laboratory and Forensic Medicine (I-PPerForM),
Universiti Teknologi MARA(UiTM),
Sungai Buloh Campus, 47000, Sungai Buloh, Selangor, Malaysia

Borang persetujuan

Id subjek:_____ ID Pusat: _____

| Dengan menandatangan di bawah, saya mengesahkan | Tandatangan ringkas di setiap kotak |
|---|---|
| 1. Saya mempunyai masa yang cukup untuk mempertimbangkan maklumat dalam kajian ini dan berpeluang untuk bertanyakan soalan. Jawapan yang diberikan adalah memuaskan. | |
| 2. Saya faham bahawa penyertaan saya dalam kajian ini adalah secara sukarela, dan saya bebas untuk menarik diri dari kajian ini pada bila-bila masa tanpa memberikan alasan dan ini sama sekali tidak akan mempengaruhi rawatan saya di masa hadapan. | |
| 3. Sebagai tambahan, jika ada maklumat baru ketika kajian ini dijalankan yang mungkin mempengaruhi kesediaan saya untuk meneruskan kajian ini, saya akan diberitahu mengenai maklumat terbaru tersebut secepat mungkin. | |
| 4. Saya memahami risiko dan faedah kajian ini, dan saya bersetuju untuk mengambil bahagian dalam kajian ini. | |
| 5. Saya faham bahawa saya mesti mengikuti arahan doktor kajian berkenaan penyertaan saya. | |
| 6. Saya memberi kebenaran untuk nota perubatan dan maklumat yang dikumpul semasa kajian, untuk dilihat oleh staf kajian, pemantau dan juruaudit yang berkelayakan, penaja atau sekutunya, dan pihak berkuasa pematuhan atau pengawal selia. | |
| 7. Saya mengesahkan bahawa saya telah membaca dan memahami Maklumat Projek Penyelidikan untuk Peserta dan saya akan membawa pulang Maklumat Projek Penyelidikan untuk Peserta ini dan Borang Persetujuan yang telah ditandatangi. | |

_____ _____

Nama subjek: Tandatangan:

No Kad Pengenalan :_____ Tarikh : _____

_____ _____

Nama saksi: Tandatangan :

No Kad Pengenalan : _____ Tarikh : _____

_____ _____

Nama Doktor Kajian: Tandatangan :

No Kad Pengenalan : _____ Tarikh : _____

PARTICIPANT INFORMATION SHEET

Study title: **Volumetric Analysis of Peri-implant Soft tissue Changes Between Polyetheretherketone(PEEK) and Standard Healing Abutments in Posterior Single Implant Restorations : A Prospective Randomized Clinical Trial**
Name of Sponsor: **Institute Straumann AG, Basel, Switzerland**
Name of Investigator: **Dr Nur Hafizah Kamar Affendi**
Name of Study Centre: **Fakulti Pergigian, Universiti Teknologi MARA, Artius Dental Specialist Centre, Kuala Lumpur**
Subject Name: _____
Subject's NRIC No: _____

**Research Title**
**Volumetric Analysis of Peri-implant Soft tissue Changes Between Polyetheretherketone(PEEK) and Standard Healing Abutments in Posterior Single Implant Restorations : A Prospective Randomized Clinical Trial**

**Introduction to research**
You are invited to take part in a clinical research study conducted by a team of dental specialists at the Faculty of Dentistry, Universiti Teknologi MARA. The study is titled**:**"Volumetric Analysis of Peri-implant Soft tissue Changes Between Polyetheretherketone(PEEK) and Standard Healing Abutments in Posterior Single Implant Restorations : A Prospective Randomized Clinical Trial ." This study aims to compare the outcomes of two digital workflows for implant-supported crowns used to restore a single missing lower molar. The implant system used in this study is the Straumann Bone Level Implant (5.5 × 10 mm). Participants will be randomly assigned to one of two groups to receive a single-implant restoration either using a standard scan body or a polyetheretherketone (PEEK) anatomic healing abutment, both fabricated through a fully digital workflow.Participation involves a total of six clinical visits over a 12-month period. These include written informed consent, the implant placement procedure, digital impressions, crown delivery, and follow-up appointments. At each visit, clinical examinations, radiographic evaluations, and questionnaires on oral function, comfort, and quality of life will be conducted.

**Purpose of research**
The aim of this study is to compare the clinical outcomes of implant-supported crown restorations fabricated using two different digital workflows: one involving a standard scan body and the other utilizing a novel anatomic healing abutment. Participants will be randomly assigned to receive either the standard healing abutment or the anatomic healing abutment during their treatment. This study seeks to evaluate the effect of each workflow on gingival tissue response and the accuracy of the final implant crown. The findings are expected to provide clinicians with evidence-based insights to improve restorative protocols in digital implant dentistry.

**Study Involvement (Research Procedure)**

If you are eligible for this study, you will first attend a screening visit (1–30 days before baseline), during which your doctor will review your medical and dental history, conduct a clinical and radiographic examination, and collect digital scans and photographs. You will also be asked to complete an oral health-related quality of life questionnaire (OHIP) and a Visual Analog Scale (VAS) to assess comfort and satisfaction.The study involves six visits over 12 months, scheduled as follows:

- Visit 1: Written informed consent, intraoral scanning, baseline questionnaires (OHIP & VAS)
- Visit 2: Implant placement, measurement of implant stability (ISQ), intraoral X-ray, clinical photographs
- Visit 3: Postoperative follow up
- Visit 4: Digital impression (IOS scan), questionnaire
- Visit 5: Final IOS scan, delivery of implant crown, questionnaire
- Visit 6: Follow-up evaluation at 12 months post-restoration (clinical and radiographic review, questionnaire)

**Responsibilities of Participants.**

It is important that you answer all the questions asked by the study staff honestly and completely. If your condition or circumstances change during the study, you must tell the study doctor. There are certain medications that you cannot take while participating in this study. The doctor will discuss those medications with you. You must not take any other medications without consulting your study doctor. You must inform your study doctor immediately if you make any changes to any of your current treatments, even those which you have been taking for a long time.

**Benefit of research**

Participants in this study may experience several potential benefits from implant treatment, including improved dental aesthetics, enhanced speech function, and greater comfort during daily activities. The restoration may also lead to better chewing efficiency and overall oral health. Additionally, dental implants are known for their durability and can provide long-term functional and aesthetic outcomes, often lasting many years with proper care.

**Research Risk**

As with any surgical procedure, dental implant placement carries certain risks. Although complications are uncommon, they are generally minor and manageable with appropriate care. The potential risks include: • Infection at the implant site • Injury or damage to surrounding structures, such as adjacent teeth or blood vessels • Nerve damage, which may result in pain, numbness, or tingling in the natural teeth, gums, lips, or chin • Allergic or hypersensitivity reactions to implant materials, particularly titanium alloy or nickel- titanium alloy Participants with known allergies to titanium or nickel-containing materials are advised not to participate in this study.Other possible risks include crown

fracture, implant failure, or the need for additional treatment. To safeguard participants' welfare:

**Crown fracture:** If the crown breaks during the study period, it will be replaced at no cost to the participant. If the fracture occurs after the study period, replacement will involve only laboratory costs, which will be borne by the participant.

**Maintenance phase:** If the implant remains survival within study period, all follow-up visits and maintenance treatments are provided with no service fees by the doctor. However, if additional bone augmentation or material use is required in this category, only the material costs will be borne by the participant.

**Implant failure:** If the implant is categorized as unsuccessful, no service fees by the doctor if it requires removal.

**What if I am injured during this study**

In case of any damage or injury occurring to you during the participation in the study, the necessary treatment will be performed by the investigator. However, the investigator is not responsible for medical expenses due to pre-existing medical conditions, any underlying diseases, any ongoing treatment process and your negligence or willful misconduct.

**What kind of treatment will I receive after my participation in the study?**

Whether you complete the study or withdraw early, your study doctor will discuss the best alternative future treatment with you.

You are advised to visit the dental clinic for periodical follow up and maintenance after the study period. However, the maintenance cost after the study period shall be borne by the patient.

**What are my alternatives if I do not participate in this study?**

Participation in this study is voluntary. If you agree to take part, then you will be asked to sign the "Informed Consent Form". You will be given a copy of the form and this Information Sheet. The study doctor will discuss other treatment options such as fixed or removable partial denture with you. Should you decide to participate, you can still withdraw from the study without penalty.

**Confidentiality**

All personal data collected during this study will be treated with the strictest confidentiality by the study doctor, study monitors, the sponsor, and the independent ethics committee. Your identity will not be revealed in any report, publication, or presentation resulting from this research. You will not be identified by name in any study documents; instead, you will be assigned a unique identification number that will be used throughout the study.Access to your data will be strictly limited. No personal information will be disclosed to third parties without your explicit permission, except to authorized individuals involved in study oversight, such as sponsor personnel (including monitors and auditors), regulatory authorities, and the

independent ethics committee. These individuals may access your Case Report Form (CRF) and related source documents as part of their regulatory and quality assurance responsibilities. The study doctor is responsible for ensuring that all personal data remain secure and confidential throughout the duration of the study and thereafter.

**Who is funding the study?**

The study is fully sponsored by Investigator initiated study by Straumann. You do not have to pay to participate in this study. If you need other treatments that are not related to this study, the cost of such treatment should be borne by you according to the rate of payment at the clinic.

**Who should I call if I have questions?**

If you have any questions about the study or if you think you have a study related injury and you want more information about the dental implant, please contact:

Principal investigator

Dr Nur Hafizah Kamar Affendi
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Institute of Pathology, Laboratory and Forensic Medicine (I-PPerForM),
Universiti Teknologi MARA(UiTM),
Sungai Buloh Campus, 47000, Sungai Buloh, Selangor, Malaysia

INFORMED CONSENT SHEET

Subject ID: _____ Site ID: _____

| By signing below, I confirm | Initial at box |
|---|---|
| 1. I have sufficient time to consider the information in the study and have the opportunity and to ask questions, The have been answered satisfactorily | |
| 2. I understand that my participation in this study is voluntary, and I am free to withdraw from the study at any time without giving any reason and this will not way affect my future | |
| 3. In addition, if any new information arises during the course of this study, which may have bearing on my willingness to continue on this study, I will be notified of this new information as soon as possible | |
| 4. I understand the risk and benefits of this study, and I agree to take part in the study | |
| 5. I understand that I must follow the study doctor's instructions related to my participation | |
| 6. I give permission to my medical notes and information collection during the study, to be looked at, in confidence, by study staff, qualified monitors and auditors, the sponsors or its affiliates and governmental or regulatory authorities | |
| 7. I confirm that I have read and understand the Patient information Sheet and I will bring home a copy of this Patient information Sheet and signed Informed consent Form | |

_____ _____

Name of subject Signature

NRIC No: _____ Date: _____

_____ _____

Name of witness: Signature

NRIC No: _____ Date: _____

_____ _____

Name of Study Doctor Signature

NRIC No: _____ Date: _____