Predoctoral Implant Program @ UIC

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University of Illinois at Chicago, College of Dentistry

Overview

- Predoctoral implant education
  Curriculum, workflow, and assessment
- Digital Implant Dentistry
- Advanced predoctoral implant program



Predoctoral Implant Education @ UIC

Comprehensive program

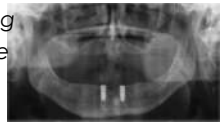
Competency based

Didactic courses 2nd year

Clinical experiences-3rd and 4th year

Single tooth implants

Implant supported overdentures

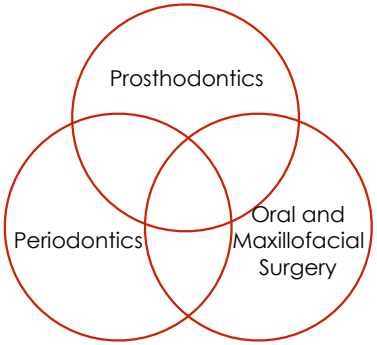



Students will become competent in the assessment, diagnosis, treatment planning and treatment of patients requiring single tooth implant restorations and implant supported overdentures

Didactic Course

Restorative driven

Interdisciplinary approach



Didactic Course

Prosthodontics

Introduction to implant dentistry Biomaterials and biocompatibility
Diagnosis and treatment planning I- Restorative indications
Edentulous mandible- surgical and restorative procedures
Surgical guide fabrication- IOD
Restorative considerations I- STI
Restorative considerations II- STI
Restorative considerations III-custom abutments
Surgical guide fabrication- STI
CAD/CAM implant crowns
Single tooth implant provisionalization
Complications/failures of dental implants

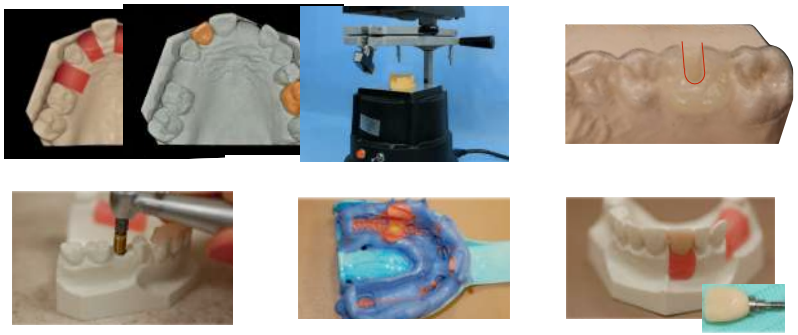
Oral and Maxillofacial Surgery

Diagnosis and treatment planning II- Surgical indications
Implant surgery II- Advanced implant surgical procedures

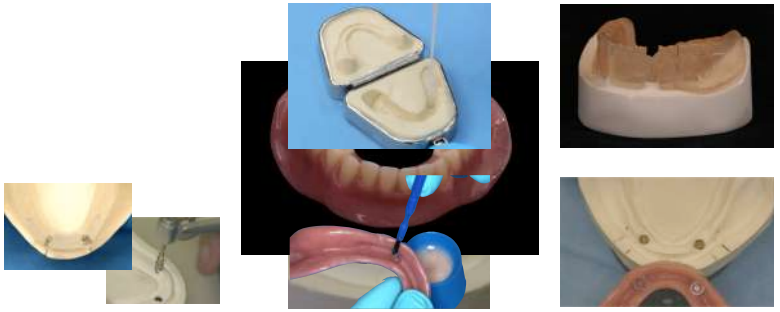
Periodontics

Implant surgery I- Standard implant surgical procedures

Single Tooth Implant



Mandibular Implant supported Overdenture

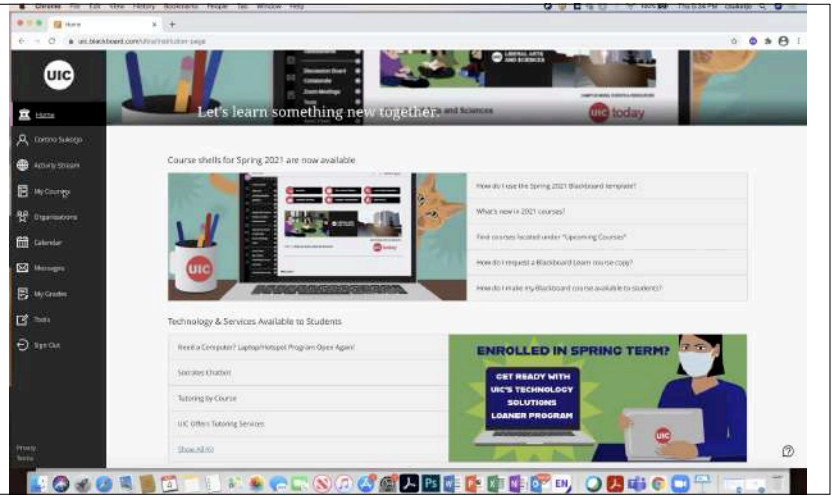


Supplement Videos

Single Tooth Implant:Surgical Guide Fabrication

Mandibular Implant Overdenture: Direct Tehnique

Mandibular Implant Overdenture: Surgical Guide Fabrication



Predoctoral Implant Education at UIC

Assessment- Didactic course-2nd year

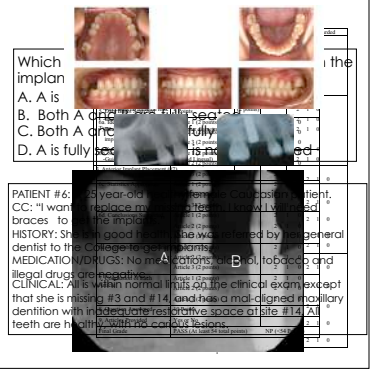
Written exam/quiz

Laboratory exercises
(Student self assessment & Faculty evaluation)

Evidence based dentistry report

Station-to-station exam

Objective Structured Clinical Exam



Predoctoral Digital Dentistry at UIC

Competency based

Students must be competent in the assessment, diagnosis, treatment planning, and application of digital technologies with implant supported single unit restorations for partially edentulous patients (Established 2016)

Single Tooth Implant

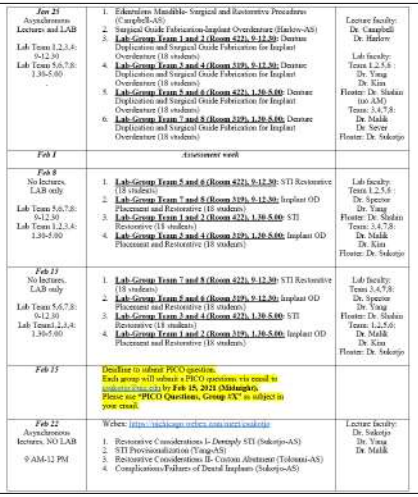
Didactic 2nd year (Laboratory Exercise)

- Intraoral scan body implant level impression
  - Hands-on exercise
  - File transfer- digital workflow
- Lab-based scan
  - Video Demonstration

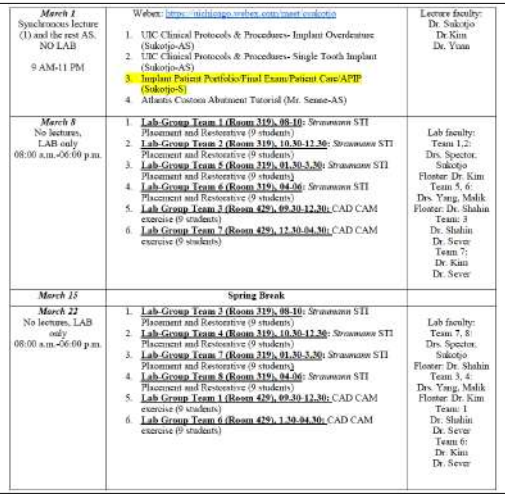
DAOB 323
Introduction to Dental Implants-Course Schedule
Spring Semester 2021 (DMD)

Course Director: Dr. Sukotjo
All Lectures: Online: both Asynchoronous and Synchronous
Lab Sessions: See Respective Dates

Lecture Date/Time	Topic (S: Synchronous, AS: Asynchoronous)	Lecturer
Jan 4 9 AM-12 PM Synchronous Lectures only	Webex: https://michigan.webex.com/meet/csukotjo 1. Course Requirements/Introduction to Implant Dentistry (Sukotjo-S) 2. Biomaterials and Biocompatibility (Cooper-AS) 3. Diagnosis and Treatment Planning I-Restorative Indications (Sukotjo-S) 4. Diagnosis and Treatment Planning II-Surgical Indications (Han-AS) 5. Surgical Guide Fabrication-Single Tooth Implant (Sukotjo-S)	Lecture faculty: Dr. Cooper Dr. Sukotjo Dr. Han
Jan 11 Asynchronous Lectures and LAB Lab Team 1,2,3,4: 9-12.30 Lab Team 5,6,7,8: 1.30-5.00	1. Implant Surgery I-Standard Implant Surgical Procedures (Karateew-AS) 2. Implant Surgery II-Advanced Implant Surgical Procedures (Han-AS) 3. **Lab-Group Team 1 and 2 (Room 422), 9-12.30:** STI Surgical Guide Fabrication (18 students) 4. **Lab-Group Team 3 and 4 (Room 319), 9-12.30:** STI Surgical Guide Fabrication (18 students) 5. **Lab-Group Team 5 and 6 (Room 422), 1.30-5.00:** STI Surgical Guide Fabrication (18 students) 6. **Lab-Group Team 7 and 8 (Room 319), 1.30-5.00:** STI Surgical Guide Fabrication (18 students)	Lecture faculty: Dr. Karateew Dr. Han Lab faculty: Team 1,2,5,6 : Dr. Spector Dr. Yang Dr. Sever Team: 3,4,7,8: Dr. Malik Dr. Shahin Floater: Dr. Sukotjo
Jan 18	**Dr. Martin Luther King, Jr. Holiday**	



Jan 25 Asynchronous Lectures and LAB Lab Team 1,2,3,4: 9-12.30 Lab Team 5,6,7,8: 1.30-5.00	1. Edentulous Mandible- Surgical and Restorative Procedures (Campbell-AS) 2. Surgical Guide Fabrication-Implant Overdenture (Harlow-AS) 3. **Lab-Group Team 1 and 2 (Room 422), 9-12.30:** Denture Duplication and Surgical Guide Fabrication for Implant Overdenture (18 students) 4. **Lab-Group Team 3 and 4 (Room 319), 9-12.30:** Denture Duplication and Surgical Guide Fabrication for Implant Overdenture (18 students) 5. **Lab-Group Team 5 and 6 (Room 422), 1.30-5.00:** Denture Duplication and Surgical Guide Fabrication for Implant Overdenture (18 students) 6. **Lab-Group Team 7 and 8 (Room 319), 1.30-5.00:** Denture Duplication and Surgical Guide Fabrication for Implant Overdenture (18 students)	Lecture faculty: Dr. Campbell Dr. Harlow Lab faculty: Team 1,2,5,6 : Dr. Yang Dr. Kim Floater: Dr. Shahin (no AM) Team: 3,4,7,8: Dr. Malik Dr. Sever Floater: Dr. Sukotjo
Feb 1	**Assessment week**	
Feb 8 No lectures, LAB only Lab Team 5,6,7,8: 9-12.30 Lab Team 1,2,3,4: 1.30-5.00	1. **Lab-Group Team 5 and 6 (Room 422), 9-12.30:** STI Restorative (18 students) 2. **Lab-Group Team 7 and 8 (Room 319), 9-12.30:** Implant OD Placement and Restorative (18 students) 3. **Lab-Group Team 1 and 2 (Room 422), 1.30-5.00:** STI Restorative (18 students) 4. **Lab-Group Team 3 and 4 (Room 319), 1.30-5.00:** Implant OD Placement and Restorative (18 students)	Lab faculty: Team 1,2,5,6 : Dr. Spector Dr. Yang Floater: Dr. Shahin Team: 3,4,7,8: Dr. Malik Dr. Kim Floater: Dr. Sukotjo
Feb 15 No lectures, LAB only Lab Team 5,6,7,8: 9-12.30 Lab Team1,2,3,4: 1.30-5.00	1. **Lab-Group Team 7 and 8 (Room 422), 9-12.30:** STI Restorative (18 students) 2. **Lab-Group Team 5 and 6 (Room 319), 9-12.30:** Implant OD Placement and Restorative (18 students) 3. **Lab-Group Team 3 and 4 (Room 422), 1.30-5.00:** STI Restorative (18 students) 4. **Lab-Group Team 1 and 2 (Room 319), 1.30-5.00:** Implant OD Placement and Restorative (18 students)	Lab faculty: Team 3,4,7,8: Dr. Spector Dr. Yang Floater: Dr. Shahin Teams: 1,2,5,6: Dr. Malik Dr. Kim Floater: Dr. Sukotjo
Feb 15	Deadline to submit PICO question. Each group will submit a PICO question via email to soukotjo@umich.edu by **Feb 15, 2021 (Midnight).** Please use **"PICO Question, Group #X"** as subject in your email.	
Feb 22 Asynchronous lectures, NO LAB 9 AM-12 PM	Webex: https://michigan.webex.com/meet/csukotjo 1. Restorative Considerations I- Demply STI (Sukotjo-AS) 2. STI Provisionalization (Tonge-AS) 3. Restorative Considerations II- Custom Abutment (Tokumi-AS) 4. Complications/Failures of Dental Implants (Sukotjo-AS)	Lecture faculty: Dr. Sukotjo Dr. Yang Dr. Malik



March 1 Synchronous lecture (1) and the rest AS. NO LAB 9 AM-11 PM	Webex: https://michigan.webex.com/meet/csukotjo 1. UIC Clinical Protocols & Procedures- Implant Overdenture (Sukotjo-AS) 2. UIC Clinical Protocols & Procedures- Single Tooth Implant (Sukotjo-AS) 3. Implant Patient Portfolio/Final Exam/Patient Care/APIP (Sukotjo-S) 4. Atlantis Custom Abutment Tutorial (Mr. Sense-AS)	Lecture faculty: Dr. Sukotjo Dr Kim Dr. Yuan
March 8 No lectures, LAB only 08:00 a.m.-06:00 p.m.	1. **Lab-Group Team 1 (Room 319), 08-10:** *Straumann* STI Placement and Restorative (9 students) 2. **Lab-Group Team 2 (Room 319), 10.30-12.30:** *Straumann* STI Placement and Restorative (9 students) 3. **Lab-Group Team 5 (Room 319), 01.30-3.30:** *Straumann* STI Placement and Restorative (9 students) 4. **Lab-Group Team 6 (Room 319), 04.00:** *Straumann* STI Placement and Restorative (9 students) 5. **Lab Group Team 3 (Room 429), 09.30-12.30:** CAD CAM exercise (9 students) 6. **Lab Group Team 7 (Room 429), 12.30-04.30:** CAD CAM exercise (9 students)	Lab faculty: Team 1,2: Drs. Spector, Sukotjo Floater: Dr. Kim Team 5, 6: Drs. Yang, Malik Floater: Dr. Shahin Team: 3 Dr. Shahin Dr. Sever Team 7: Dr. Kim Dr. Sever
March 15	**Spring Break**	
March 22 No lectures, LAB only 08:00 a.m.-06:00 p.m.	1. **Lab-Group Team 3 (Room 319), 08-10:** *Straumann* STI Placement and Restorative (9 students) 2. **Lab-Group Team 4 (Room 319), 10.30-12.30:** *Straumann* STI Placement and Restorative (9 students) 3. **Lab-Group Team 7 (Room 319), 01.30-3.30:** *Straumann* STI Placement and Restorative (9 students) 4. **Lab-Group Team 8 (Room 319), 04.00:** *Straumann* STI Placement and Restorative (9 students) 5. **Lab Group Team 1 (Room 429), 09.30-12.30:** CAD CAM exercise (9 students) 6. **Lab Group Team 6 (Room 429), 1.30-04.30:** CAD CAM exercise (9 students)	Lab faculty: Team 7, 8: Drs. Spector, Sukotjo Floater: Dr. Shahin Team 3, 4: Drs. Yang, Malik Floater: Dr. Kim Team: 1 Dr. Shahin Dr. Sever Team 6: Dr. Kim Dr. Sever

March 29 No lectures, LAB only 09.30-04.30	1. Restorative Considerations III- *Straumann* STI (Mohamad-AS) 2. **Lab Group Team 4 (Room 429), 09.30-12.30:** CAD CAM exercise 3. **Lab Group Team 5 (Room 429), 1.30-04.30:** CAD CAM exercise	Lecture faculty: Dr. Mohammad Lab faculty: Team: 4 Dr. Shahin, Spector Dr. Sever Floater: Sukotjo Team 5: Dr. Kim, Malik Floater: Yang
April 5 No lectures, LAB only 09.30-04.30	1. **Lab Group Team 2 (Room 429), 09.30-12.30:** CAD CAM exercise (9 students) 2. **Lab Group Team 8 (Room 429), 1.30-04.30:** CAD CAM exercise (9 students)	Lab faculty: Team: 2 Dr. Shahin, Spector Dr. Sever Floater: Sukotjo Team 8: Dr. Kim, Malik Floater: Yang
April 5	Final deadline for EBD Paper. Each group will submit a paper by **Monday, April 5, 2021 (midnight).**	
April 12 09.30-10.30	**Performance Examination: Station to Station Exam (online)**	

Predoctoral Implant Clinic

8 operatories

6 faculty

1 clinic manager

1 digital tech

2 receptionists

Monday, Tuesday,
Wednesday, Thursday, Friday
9:30-12:30; 1:30-4:30

Sequence of Implant Patient Flow

Assessment & Diagnosis

Consultation (Restorative & Surgical)

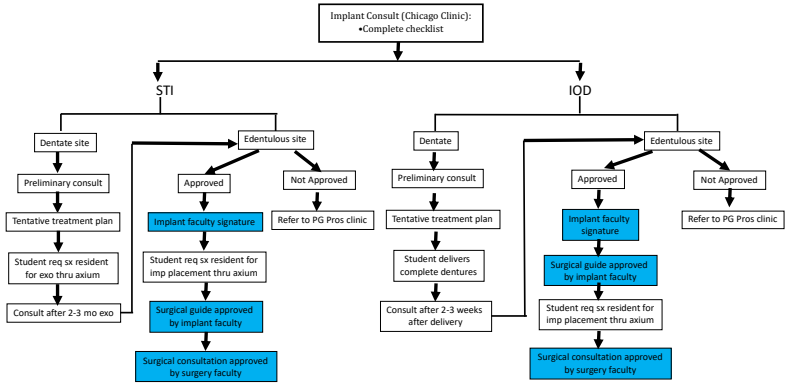
Treatment Planning

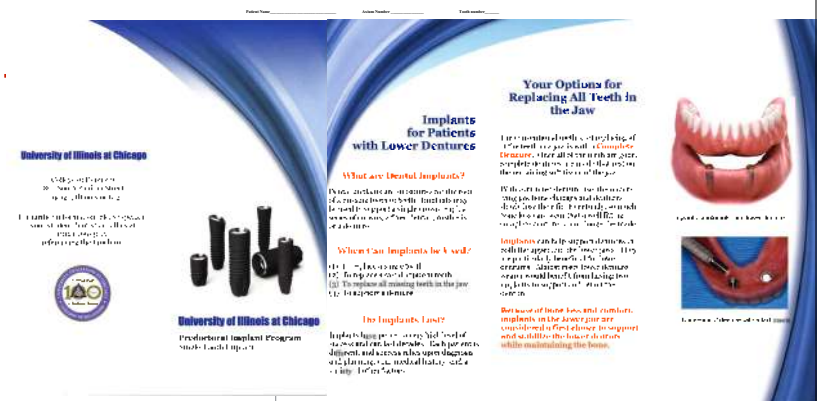
Surgical Phase ⇨ Oral Surgery (40%), Periodontics (40%), Prosthodontics (20%)

Restorative Phase

Maintenance Phase

Predoctoral Implant Program Workflow

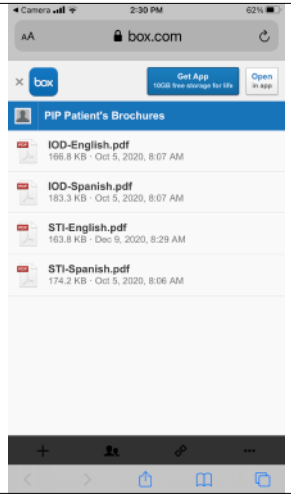




Maintenance Phase

Predoctoral Implant Program
Patient's Brochures

SCAN ME



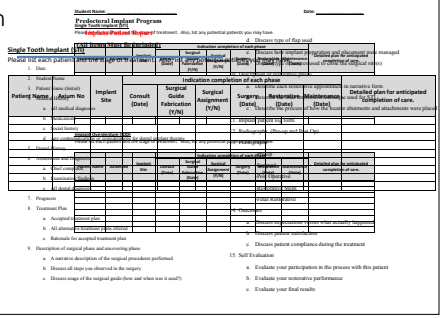
Predoctoral Implant Education at UIC

Assessment- Clinical experiences -3rd and 4th year

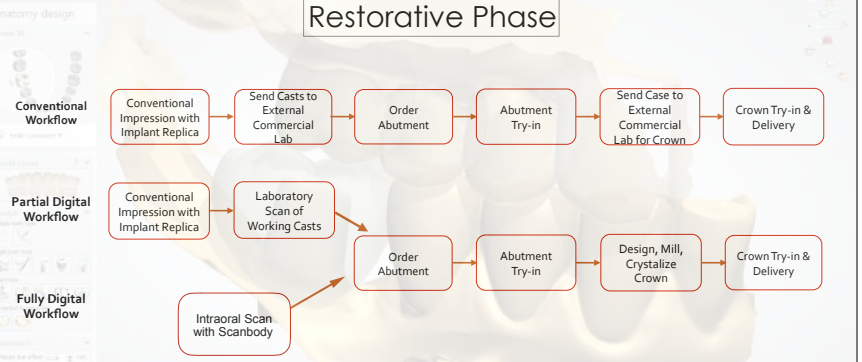
Objective Structured Clinical Exam

Implant Patient Progress Report

Implant Patient Portfolio

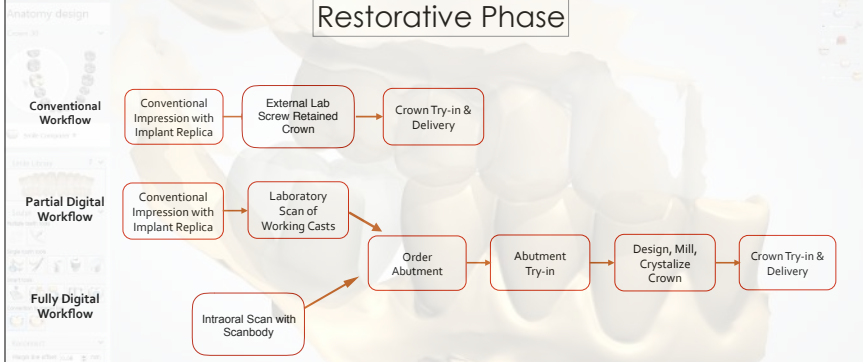


Restorative Phase



Afshari FS, Sukotjo C, Alfaro MF, McCombs J, Campbell SD, Knoernschild KL, Yuan JC. Integration of digital dentistry into a predoctoral implant program: program description, rationale, and utilization trends. J Dent Educ. 2017: 986-994

Restorative Phase



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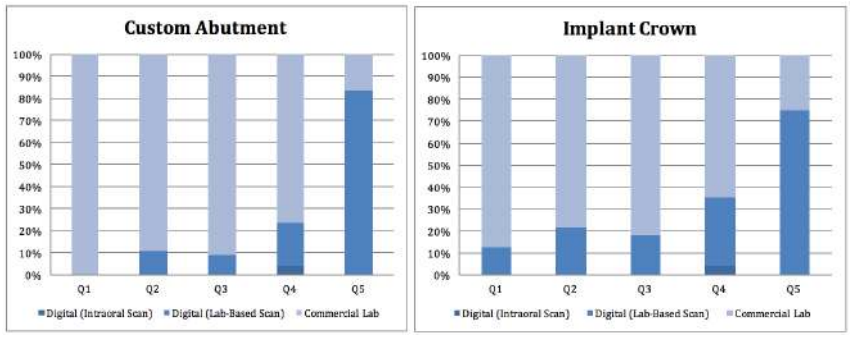

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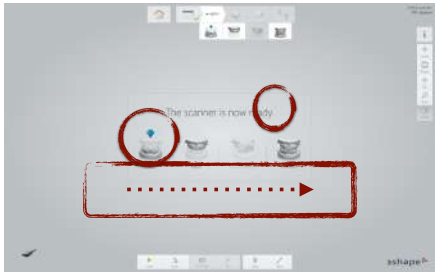
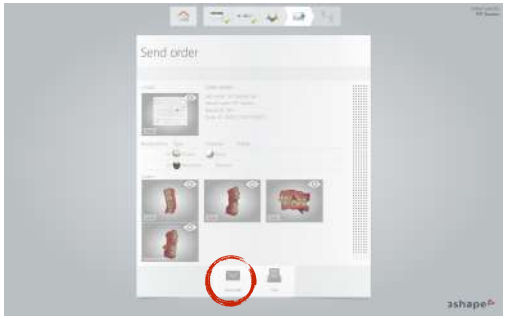
Predoctoral Implant Digital Dentistry Workflow



Predoctoral Implant Digital Dentistry Workflow



Predoctoral Implant Digital Dentistry Workflow

Collaboration between Predoc and Postdoc

- Early introduction of multidisciplinary approach of implant therapy
- Pre-doctoral students have more access to specialty clinics
- Post-doctoral students more involved in clinical teaching

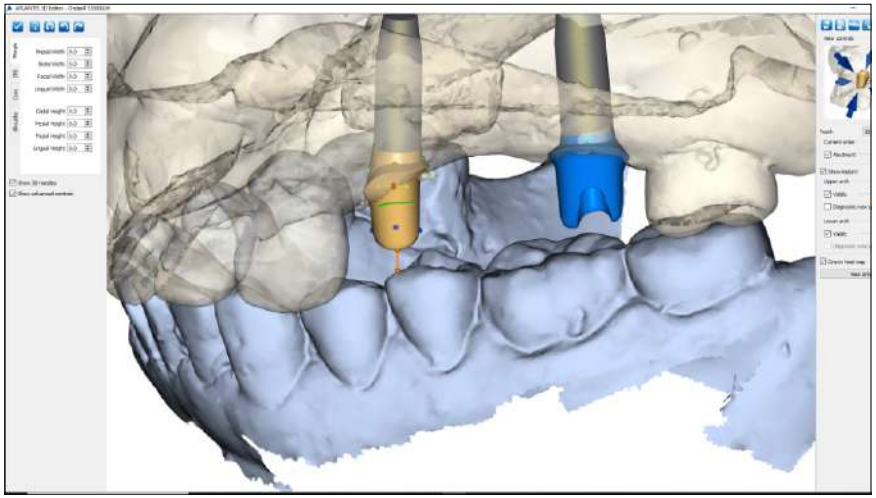
Advantages for patients

- Availability: 250 pre-doctoral students and 25+ surgical residents
- Expertise: Oral and maxillofacial surgery, Periodontics, Prosthodontics
- Cost: Implant company subsidize, cost effective

3 Unit IS-FPD

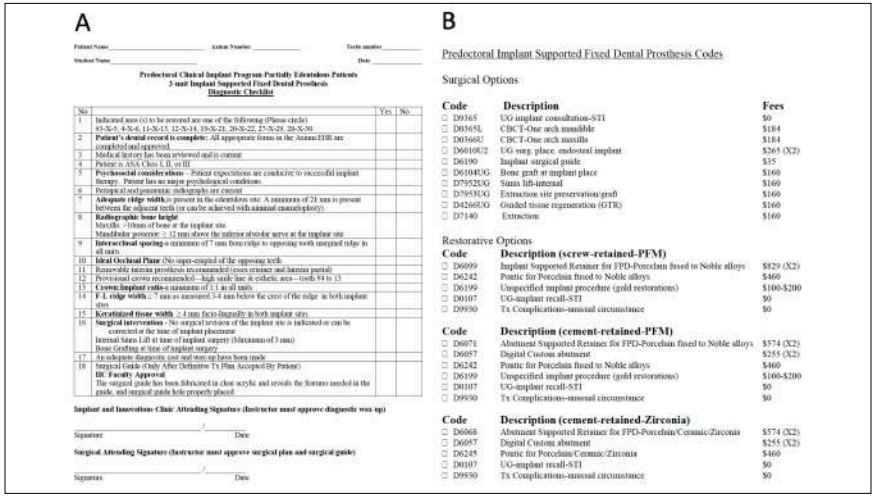
Pre-clinic

Patient Care



Implant supported FDP (ISFDP)

- The mesial-distal edentulous ridge must be at least 21 mm between roots as examined clinically and radiographically
- Only can be applied to replace premolar: M-X-P or P-X-C
- An ideal occlusal plane is expected
- Only one ISFDP per patient will be accepted
- ISFDP restoration can be screw or cement-tempbond retained



A

Predoctoral Clinical Implant Program-Partially Edentulous Patients
3-unit Implant Supported Fixed Dental Prosthesis
Diagnostic Checklist

No.		Yes	No
1	Indicated area (s) to be restored are one of the following (Please circle) #3-X-5, 4-X-6, 11-X-15, 12-X-14, 19-X-21, 20-X-22, 27-X-29, 28-X-30		
2	**Patient's dental record is complete:** All appropriate forms in the Axium/EHR are completed and approved.		
3	Medical history has been reviewed and is current		
4	Patient is ASA Class I, II, or III		
5	**Psychosocial considerations** – Patient expectations are conducive to successful implant therapy. Patient has no major psychological conditions.		
6	Periapical and panoramic radiographs are current		
7	**Adequate ridge width** is present in the edentulous site: A minimum of 21 mm is present between the adjacent teeth (or can be achieved with minimal osteoplasty).		
8	**Radiographic bone height** Maxilla: >10mm of bone at the implant site. Mandibular posterior: ≥ 12 mm shows the inferior alveolar nerve at the implant site		
9	**Interocclusal spacing** a minimum of 7 mm from ridge to opposing tooth unopposed ridge in all cases		
10	**Ideal Occlusal Plane** (No super-erupted of the opposing teeth		
11	Removable interim prosthesis recommended (cases retainer and hawleys partial)		
12	Provisional crown recommended—high smile line & esthetic area—teeth #4 to 13		
13	**Crown:implant ratio**-a minimum of 1:1 in all units		
14	**F-L ridge width** ≥ 7 mm as measured 3-4 mm below the crest of the ridge in both implant sites		
15	**Keratinized tissue width** ≥ 4 mm facio-lingually in both implant sites		
16	**Surgical intervention** - No surgical revision of the implant site is indicated or can be corrected at the time of implant placement Internal Sinus Lift at time of implant surgery (Minimum of 5 mm) Bone Grafting at time of implant surgery		
17	An adequate diagnostic cast and wax up have been made		
18	Surgical Guide (Only After Definitive Tx Plan Accepted By Patient) **IDC Faculty Approval** The surgical guide has been fabricated in clear acrylic and reveals the features needed in the guide, and surgical guide hole properly placed		

Implant and Innovations Clinic Attending Signature (Instructor must approve diagnostic wax up)

Signature / Date

Surgical Attending Signature (Instructor must approve surgical plan and surgical guide)

Signature / Date

B

Predoctoral Implant Supported Fixed Dental Prosthesis Codes

Surgical Options

Code	Description	Fees
D9365	UG implant consultation-STI	$0
D0365L	CBCT-One arch mandible	$184
D0366U	CBCT-One arch maxilla	$184
D6010UG	UG surg. place. endosteal implant	$265 (X2)
D6190	Implant surgical guide	$35
D6104UG	Bone graft at implant place	$160
D7952UG	Sinus lift-internal	$160
D7953UG	Extraction site preservation/graft	$160
D4266UG	Guided tissue regeneration (GTR)	$160
D7140	Extraction	$160

Restorative Options

Code	Description (screw-retained-PFM)	
D6099	Implant Supported Retainer for FPD-Porcelain fused to Noble alloys	$829 (X2)
D6242	Pontic for Porcelain fused to Noble alloys	$460
D6199	Unspecified implant procedure (gold restorations)	$100-$200
D0107	UG-implant recall-STI	$0
D9930	Tx Complications-unusual circumstance	$0

Code	Description (cement-retained-PFM)	
D6071	Abutment Supported Retainer for FPD-Porcelain fused to Noble alloys	$574 (X2)
D6057	Digital Custom abutment	$255 (X2)
D6242	Pontic for Porcelain fused to Noble alloys	$460
D6199	Unspecified implant procedure (gold restorations)	$100-$200
D0107	UG-implant recall-STI	$0
D9930	Tx Complications-unusual circumstance	$0

Code	Description (cement-retained-Zirconia)	
D6068	Abutment Supported Retainer for FPD-Porcelain/Ceramic/Zirconia	$574 (X2)
D6057	Digital Custom abutment	$255 (X2)
D6245	Pontic for Porcelain/Ceramic/Zirconia	$460
D0107	UG-implant recall-STI	$0
D9930	Tx Complications-unusual circumstance	$0

Advanced Predoctoral Implant Program

- Introduced in Summer 2011
- Strict selection proces
- Placement in oral surgery, prosthodontics and periodontics
- Complete implant patient care
- Incorporation of technology
- Seminars with residents

Afshari FS, Yuan JC, Quimby A, Harlow R, Campbell SD, Sukotjo C. Advanced predoctoral implant program at UIC: description and qualitative analysis. J Dent Educ. 2014:770-8.

Advanced Predoctoral Implant Program

- Positive learning experience
- Encourage interest in implant dentistry
- Increased interest in surgical placement
- Increased confidence in place and restore implants

Afshari FS, Yuan JC, Quimby A, Harlow R, Campbell SD, Sukotjo C. Advanced predoctoral implant program at UIC: description and qualitative analysis. J Dent Educ. 2014:770-8.

Advanced Predoctoral Implant Program

- Class of 2021

Prosth: Ellie Park, Stephanie Schreiber, Javid Patel

Perio: Yelin Ha, Magdalena Orlowska

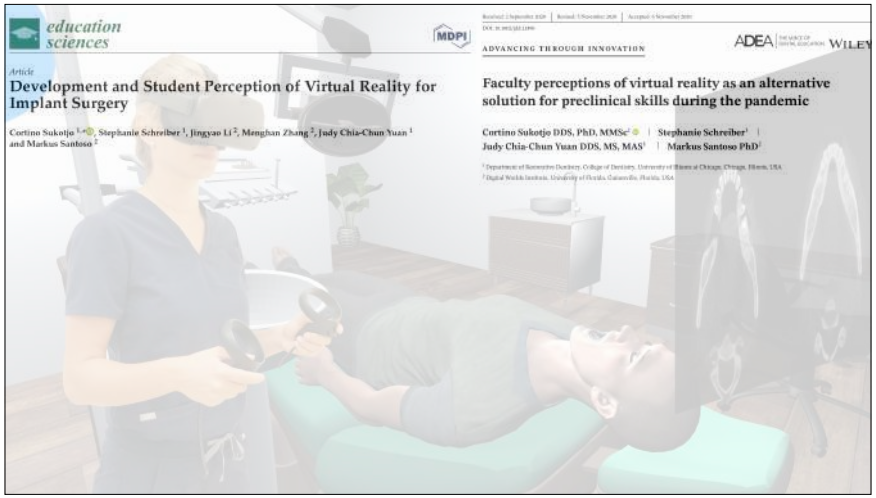
OS: William J. Prosniewski, Stephanie Batista

- Class of 2022

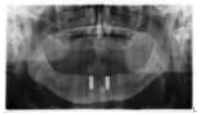
Prosth: Daniel Bicknell, Jeanne Le, Nidhi Mahajan

Perio: Polina Gubareva, Sofia Thompson

OS: Lily Fayz, Brandon Evert



Advanced Predoctoral Implant Program



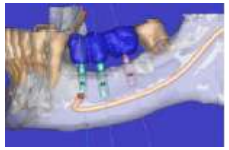
Placement in Oral surgery, prosthodontics and periodontics

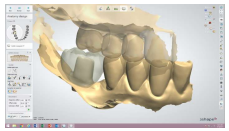
Complete implant patient care

Incorporation of technology

Strict protocols/supervision

Advanced Predoctoral Implant Program





Simplant training

Atlantis abutment edit

Digital crown design

Literature review

Seminars with prosthodontics residents

Patient presentation

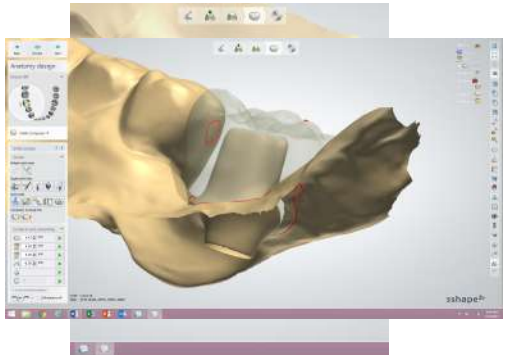
Afshari FS, Yuan JC, Quimby A, Harlow R, Campbell SD, Sukotjo C. Advanced predoctoral implant program at UIC: description and qualitative analysis. J Dent Educ. 2014:770-8.

Digital Crown Design Exercise

Request core file

Import case into design software

Virtual crown design



Advanced Predoctoral Implant Program

Positive learning experience

Encourage interest in implant dentistry

Increased interest in surgical placement

Increased confidence in place and restore implants

Afshari FS, Yuan JC, Quimby A, Harlow R, Campbell SD, Sukotjo C. Advanced predoctoral implant program at UIC: description and qualitative analysis. J Dent Educ. 2014:770-8.

Predoctoral Implant Education at UIC

Provides predictable short-term outcome with few complications

Thoughtful diagnosis and restorative driven philosophy lead to favorable therapy results

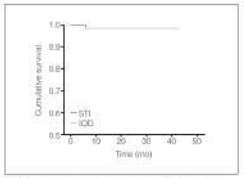


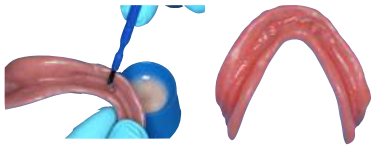
Fig 2 . Kaplan-Meier survival function for implants placed.

Lee DJ, T Harlow RF, Yuan JC, Sukotjo C, Knoernschild KL, Campbell SD. Three-year clinical outcomes of implant treatments provided at a predoctoral implant program. Int J Prosthodont. 2011:71-6.

Predoctoral Implant Education at UIC

Laboratory exercises important in implant education and preparation for providing care

Majority students plan to provide single tooth implant and implant-supported overdenture treatments



Yuan JC, Kaste LM, Lee DJ, Harlow RF, Knoernschild KL, Campbell SD, Sukotjo C. Dental students perceptions of predoctoral implant education and plans for providing implant treatment. J Dent Educ. 2011:750-60.

Predoctoral Implant Education at UIC

Predoctoral students able to provide esthetically acceptable single tooth implant restoration in esthetic zone

Patients highly satisfied with esthetic outcomes

Taylor EJ, Yuan JC, Lee DJ, Harlow RF, Knoernschild KL, Campbell SD, Sukotjo C. Are predoctoral students able to provide single tooth implant restorations in the maxillary esthetic zone? J Dent Educ. 2014:779-88.

ACP PROSTHODONTISTS

Prosthodontic Implant Club at UIC, Program Description and Survey Analysis

Michelle Howard Rynn, DMD, FACP,[1] Fatemeh S. Afshari, DMD, MS,[1] Justin Schneider,[2] Judy Chia-Chun Yuan, DDS, MS,[1] Rand Harlow, DDS,[1] Kent L. Knoernschild, DMD, MS, FACP,[1] Stephen D. Campbell, DDS, MMSc, FACP,[1] & Cortino Sukotjo, DDS, MMSc, PhD[1]

[1]Department of Restorative Dentistry, University of Illinois at Chicago College of Dentistry, Chicago, IL
[2]University of Illinois at Chicago College of Dentistry, Chicago, IL

Table 1 PIC-UIC presentation topics

Presenter	Topic
Department head	"Introduction to PIC-UIC"
Prosthodontic faculty	"Single-Tooth Implant Surgical Placement"
2nd-year prosthodontic resident	"Single-Tooth Implant Placement & Restoration"
3rd-year prosthodontic resident & 4th-year predoctoral student	"Advanced Training in Prosthodontics"
Director of UIC Advanced Prosthodontic Program	"3D Planning for Guided Restorations"
PIC-UIC members	"Student Experiences at 2013 ACP Annual Scientific Program"
Private practitioner	"Ridge Expansion in Implant Therapy"
2nd-year prosthodontic resident	"Fixed Provisional Solutions in Implant Dentistry"

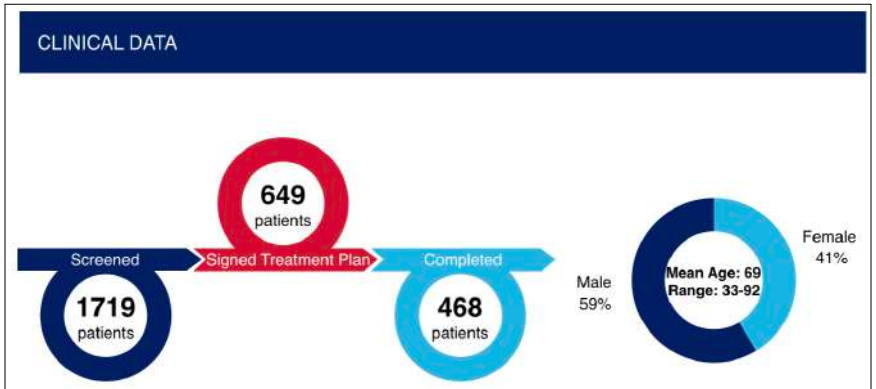


Figure 1. Data of implant-retained overdenture patients from 4/2006-9/2020.

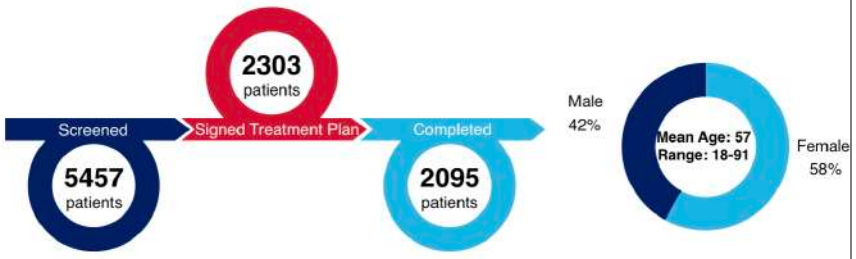


Figure 2. Data of single-tooth implant patients from 8/2006-9/2020.

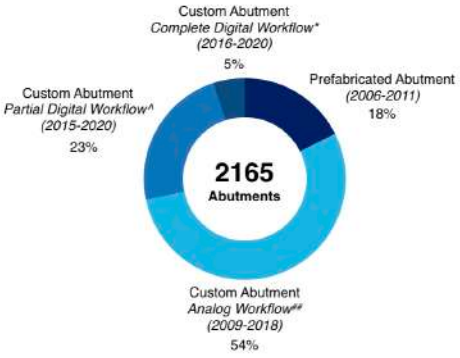


Figure 3. Data of single tooth implant supported abutments from 8/2006-9/2020.

Note: ## casts shipped to the commercial laboratory.
^ lab-based scan of the casts in-house by the digital design technician.
*intra-oral scanning.

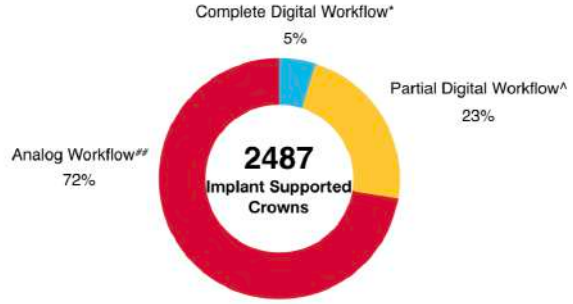
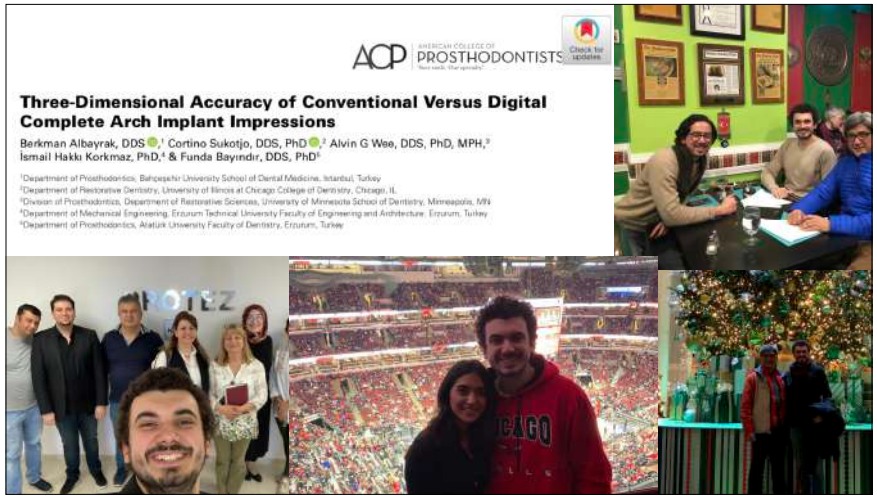


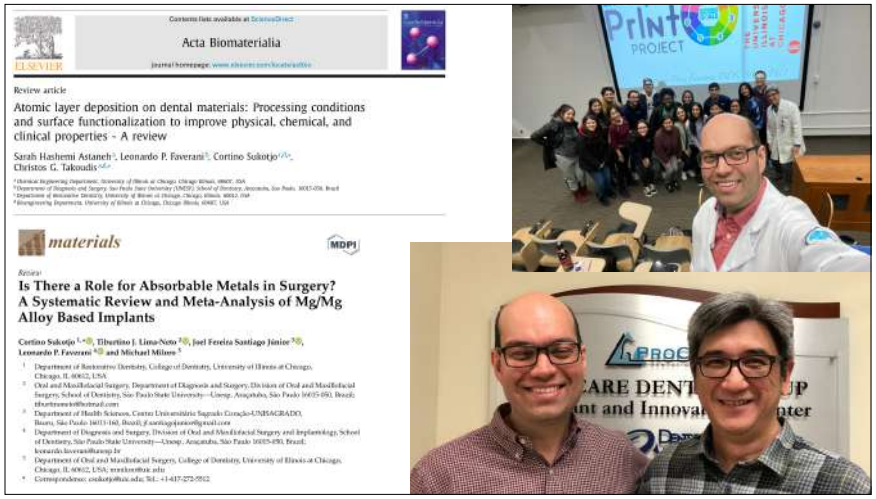
Figure 4. Data of single tooth implant supported crowns from 8/2006-9/2020

Note: ## Porcelain-fused-to-metal crowns from the commercial laboratory.
^ All-ceramc lithium disilicate crowns from lab-based scanned casts by the digital design technician in-house.
* All-ceramc lithium disilicate crowns from intra-oral scanning.

Summary: Predoctoral Implant Program @UiC

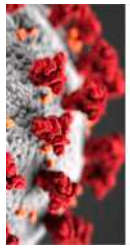
- Follow the current trend
- Structured curriculum (preclinic and clinic), assessment , equality, faculty calibration
- Multidisciplinary, collaboration predoc-postdoc
- Company supported (preclinic and clinic)





الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
Garden of Knowledge and Virtue

Malaysian Dental Students' Perspective on Implementation of Online Learning due to COVID 19 Pandemic - a cross sectional study



IMPACT OF COVID-19 AMONG DENTAL STUDENTS IN MALAYSIA

BY:
ZAWIN NAJAH BINTI AZHAR (1716116)
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SUPERVISOR:
ASST. PROF. DR. WIDYA LESTARI
ASST. PROF. DR. AZLINI ISMAIL
ASSOC. PROF. DR. CORTINO SUKOI ITJO

molecules MDPI

Article

Dentin Matrix Protein 1 on Titanium Surface Facilitates Osteogenic Differentiation of Stem Cells

Suchada Kongkiatkamon [1,2,*], Amsaveni Ramachandran [3], Kent L. Knoernschild [4], Stephen D. Campbell [5,6], Cortino Sukotjo [3,6] and Anne George [3]

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