TECHNOLOGY: INTEGRATING CLINICAL TECHNOLOGIES INTO THE DENTAL CURRICULUM
All of the following cases and pictures involve pre-doctorate students
OLD THOUGHT: YOU CAN ONLY DO INLAYS/ONLAYS/SINGLE UNITS
NEW THOUGHT: WHAT CAN'T YOU DO? AND WHY NOT?????
CHANGING LANDSCAPE

- Technological advances
- Allow institution to customize to fit their needs/philosophy
- Rapidly changing (<6 months)
  - Software
  - Materials
  - Applications
SYSTEMS OVERVIEW
SIRONA BLUECAM

- Single image capture
- Powder
- Accuracy approximately 20 microns
- Closed architecture
- Design capabilities
- Teaching software available
SYSTEMS OVERVIEW
SIRONA OMNICAM

- Continuous image capture
- No powder
- Accuracy approximately 20 microns
- Closed architecture
- Design capabilities
- Teaching software available
SYSTEMS OVERVIEW
PLANSCAN (E4D)

- Continuous image capture
- No powder
- Accuracy less than 25 microns
- Open architecture
- Design capabilities
- Teaching software available
SYSTEMS OVERVIEW

3M TRUE DEFINITION

- Video image capture
- Powder
- Accuracy to less than 5 microns
- Open architecture
SYSTEMS OVERVIEW

3SHAPE TRIOS

- Cart and Pod
- Continuous image capture
- No powder
- Accuracy approximately 20 microns
- Open architecture
- Design capabilities (available)
# Systems Overview: Fees

<table>
<thead>
<tr>
<th>System</th>
<th>Per Scan Fee</th>
<th>Software Upgrade Fee</th>
<th>Annual License Fee</th>
<th>Monthly Fee</th>
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<tr>
<td>Sirona Bluecam</td>
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<td>Sirona Omnicam</td>
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<td>Planscan (E4D)</td>
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<td>Option 2</td>
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<td>3M True Definition</td>
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<td>3Shape Trios</td>
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</table>
LAB SCANNERS
COST

• **Entry-level scanner:** $15,000 – 25,000
  • **Come with software**
  • **Buy other software to use** ($5-9,000 for basic)
• **Purchase additional modules** ($1000-10,000)
  • **Removable, Model maker, Implant abutment, etc**
  • **Annual maintenance:** $500-9,000 (based on modules)
• **Annual license fee** ($1000-3000)
• “**Click fees**” – exportation of files
OPTIONS

#10 screw retained PFM (digital impression)
CLINICAL INTEGRATION: CHAIRSIDE CROWNS

REQUIREMENTS

• MATERIALS
• MILLING UNIT
• FIRING OVEN
• STAINS
CLINICAL INTEGRATION: VIRTUAL SUBMISSION

IN-HOUSE OR OUTSIDE LAB
Transmission

- Sent through “portal”; what happens:
  - Mining
  - Clean up scan
  - Collect performance data
- Can be issues with firewall
- Hardwire or wireless
- Stable connection
- Storage
- BAA
SECURE?

• Use “Hypertext Transfer Protocol Secure”
  • HTTPS
  • Actually layered on top of SSL/TLS
  • Cryptographic protocols
  • Asymmetric cryptography
  • Require x.509 certificate (company)
  • Analogy: Locked mailbox on street

Amazon uses it!
FELDSPATHIC
($11 MILLED BLOCK/$140 LAB)
LITHIUM DISILICATE
($23 BLOCK/$155 LAB)

#3-6 crowns
#7-11 e.max veneers
#12 crown

*In-house & Lab
ZIRCONIA
($18 BLOCK / $99-195 LAB)

#12 zirconia with porcelain facial
COSTS AND FINAL PRODUCT: CHAIRSIDE MILLING

**Time**

- **Faculty/Students/Lab technician**

**Cost (approximate fees)**

- **Milling unit**: $26,000 - $45,000
- **Firing oven - LD/Zirconia**: $4500
- **Stains**: $469 kit
COSTS AND FINAL PRODUCT: VIRTUAL SUBMISSION (approximate fees)

MODELS: $10-15
SO, WHAT CAN BE DONE?
SALVAGE CASES
(LD BLOCKS)
TEACHING ANTERIOR ESTHETICS
EMERGING AND FUTURE TECHNOLOGIES

IMPLANTS

- Fusion of CBCT and scans
- Surgical guides
- Custom abutments

REMOVABLE

Creation of virtual patients
PLANNING
SURGICAL GUIDE
SURGICAL GUIDE
CUSTOM ZIRCONIA ABUTMENTS WITH LD CROWNS (ANALOG AND DIGITAL)
CUSTOM ZIRCONIA ABUTMENT WITH LD CROWN (COMPLETELY DIGITAL)
Intraoral scan
Printed models
REMOVABLE (?)
REMOVABLE PARTIAL FRAMEWORK
PROSTHESIS
IMPLANT SUPPORTED FPD
SHADE MEASUREMENT
“The disruptive innovations that we are seeing today will redefine treatment paradigms for today and the future.”

Steven E. Eckert, DDS, MS

Editorial Comment JOMI Volume 29, Number 4, 2014

Questions?