

# **Conference of Operative Dentistry Educators**

**(CODE)**



***REGIONAL REPORTS***

***FALL 2000***



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## **Conference of Operative Dentistry Educators (CODE)**

Forward - Larry D. Haisch, D.D.S.  
National Director

As noted in the Fall 1999 CODE reports, "CODE continues to be an invaluable resource for the sharing of information, discussing concerns and solutions by Operative Dentistry educators at the Regional meetings. The collegial interaction and networking which takes place can only continue to improve the teaching of Operative Dentistry in North America." I am happy to report the same continues based on the feedback received from the Regions.

As charged by the Executive Council of the Operative Section of American Dental Educators Association, I attended the Region IV meeting hosted by Richard Lichtenthal. Again a great meeting with good discussion and sharing of information. Future meetings to be attended are those of Regions I and IV. The ability to share and discuss, to debate ideas/concepts pertaining to Operative Dentistry continues to be enhanced via the regional meetings, publishing of the reports and the utilization of electronic media for communications (E-mail) and information (web site).

Look for increased utilization of the web site for information as the posting of the 2001 National agenda, posting of the Regional Reports and a directory. Check the Region IV web site via the link from the section of CODE Regional Meetings 2000. Special thanks to Craig Passon for establishing and maintaining the site with CODE information and thank you to William Johnson for agreeing to assume the responsibility of webmaster from Craig.

The membership authorized a dues increase based on the information presented at the CODE forum, held in April at the ADEA meeting and last fall's Regional CODE meetings. Dues for 2001 - 2002 will be \$50.00 USA / \$60.00 US dollars for Canada.

Thank you to the 2000 CODE Fall Regional Meeting hosts/coordinators for their efforts on behalf of CODE:

Tan-Choe Aw (Region I), John Killip (Region II), Terry Fruits (Region III), Ron House (Region IV), Richard Lichtenthal (Region V) and Raquel Mazer (Region VI).

Thanks to Jim Simon (Region I), Terry Fruits (Region III) and Warren Scherer (Region V) for serving as Directors. Greetings to new Directors: Edmond Hewlett (Region I), Alan Ripps (Region III), Jerrold Gutz (Region V) and Poonan Jain (at large Director).

Finally I wish to acknowledge a special individual who has done the processing of all CODE letters, agendas and reports with attention to detail, appearance and accuracy, with patience and with excellent suggestions. Betty Schellpeper. Best wishes on your retirement. THANK YOU.

Current address: <http://www.uchsc.edu/sd/rstdenti/OpDSect/code.html>

Future address (CODE): <http://netserv.unmc.edu/code/codeFrame.html>

Operative section: <http://netserv.unmc.edu/code/odshp.html>

The Section of Operative Dentistry of the American Association of Dental Schools has “oversight” responsibility for sustaining and managing CODE.

- The national director will be appointed by the executive council for a three-year term, renewable not to exceed two consecutive terms.
- The director will be selected from a list of one or more individuals nominated by the CODE Advisory Committee after input from the regions.
- The director will perform the functions and duties as set forth by the council.
- The director will be a voting member of the council who will be expected to attend regional CODE meetings and the annual meeting of the council and section.

A CODE Advisory Committee will assist the national director with his/her duties.

- A CODE Advisory Committee will consist of one member (regional director) from each of the six regions plus 1 to 2 at-large members.
- Each regional director is selected by their region. The at-large member(s) may be selected by the national director and/or the executive council.
- The terms are three years, renewable not to exceed two consecutive terms.
- The national director serves as chair of the Advisory Committee.

The annual CODE regional meetings will serve as the interim meeting of the section. Some section business may be conducted at each CODE regional meeting as part of the national agenda.

Regional Directors:

- Will be a member of ADEA and the section of operative dentistry
- Will oversee the conduct and operation of CODE in their respective region while working in concert with the national director
- Will have communication media capabilities including e-mail with the capability of transmitting attachments
- Attend the region's meeting
- See that meeting dates, host person and school are identified for the following year
- Do follow-up assist on dues “non-payment” by schools
- See that reports of regional meetings are submitted within 30 days of meeting conclusion to the national director
- See that individual school rosters (operative based) are current for the region
- Identify a contact person at each school
- Assist in determining the national agenda
- Other, as required

## CODE ADVISORY COMMITTEE

<u>Region</u>		<u>Regional Director</u>	<u>Term</u> (subsequent terms - 3 years)
I	Pacific	Dr. Edmond R Hewlett UCLA Los Angeles, CA 310-325-7097 eddyhedent.ucla.edu	2000-2002
II	Midwest	Dr. John Killip University of Missouri Kansas City, MO 816-235-2094 Killipj@smtpgate.umkc.edu	2000-2002
III	South Midwest	Dr. Alan H Ripps Louisiana State University New Orleans, LA 540-619-8548 aripps@lsuhsc.edu	2001-2003
IV	Great Lakes	Dr. Bob Rashid Ohio State University Columbus, OH 614-292-3071 rashid.1@osu.edu	2001-2003
V	Northeast	Dr. Jerrold P Gutz New York University New York, NY 212-998-9722 jpg1@is2.nyu.edu	1998-2001
VI	South	Dr. Kevin Frazier Medical College of Georgia Augusta, GA 706-721-2881 kfrazier@mail.mcg.edu	1998-2001
II	At-Large	Poonam Jain Southern Illinois University Alton, IL 618-474-7073 pjain@siu.edu	1998-2001
II	National Director	Dr. Larry D. Haisch National Director University of Nebraska Lincoln, NE 402-472-1290 lhaisch@unmc.edu	1998-2001

## Regions and Schools

<u><b>Region I (Pacific) - 9</b></u> <ul style="list-style-type: none"> <li><b>U</b> Loma Linda</li> <li><b>U</b> Alberta - C</li> <li><b>U</b> British Columbia - C</li> <li><b>U</b> UCLA</li> <li><b>U</b> UCSF</li> <li><b>U</b> Oregon</li> <li><b>U</b> Pacific</li> <li><b>U</b> USC</li> <li><b>U</b> Washington</li> </ul>	<u><b>Region II (Midwest) - 10</b></u> <ul style="list-style-type: none"> <li><b>U</b> Colorado</li> <li><b>U</b> Creighton</li> <li><b>U</b> Iowa</li> <li><b>U</b> Manitoba - C</li> <li>Marquette</li> <li><b>U</b> Minnesota</li> <li><b>U</b> UMKC</li> <li><b>U</b> Nebraska</li> <li><b>U</b> Saskatchewan - C</li> <li><b>U</b> Southern Illinois</li> </ul>
<u><b>Region III (South Midwest) 7</b></u> <ul style="list-style-type: none"> <li><b>U</b> Baylor</li> <li><b>U</b> Louisiana State</li> <li><b>U</b> Mississippi</li> <li><b>U</b> Oklahoma</li> <li><b>U</b> Tennessee</li> <li><b>U</b> Texas, Houston</li> <li><b>U</b> Texas, San Antonio</li> </ul>	<u><b>Region IV (Great Lakes 11</b></u> <ul style="list-style-type: none"> <li><b>U</b> Case Western</li> <li><b>U</b> Detroit</li> <li><b>U</b> Illinois</li> <li><b>U</b> Indiana</li> <li>Michigan</li> <li><b>U</b> Northwestern</li> <li><b>U</b> Ohio State</li> <li><b>U</b> Pittsburgh</li> <li>SUNY - Buffalo</li> <li><b>U</b> West Virginia</li> <li><b>U</b> Western Ontario - C</li> </ul>
<u><b>Region V(Northeast) - 18</b></u> <ul style="list-style-type: none"> <li><b>U</b> Boston</li> <li><b>U</b> Columbia</li> <li><b>U</b> Connecticut</li> <li>Dalhousie - C</li> <li><b>U</b> Harvard</li> <li><b>U</b> Howard</li> <li><b>U</b> Laval - C</li> <li><b>U</b> Maryland</li> <li><b>U</b> McGill - C</li> <li>Montreal - C</li> <li><b>U</b> New Jersey</li> <li><b>U</b> NYU</li> <li><b>U</b> Pennsylvania</li> <li><b>U</b> SUNY - Stony Brook</li> <li><b>U</b> Temple</li> <li><b>U</b> Toronto - C</li> <li><b>U</b> Tufts</li> <li><b>U</b> US Naval Dental School</li> </ul>	<u><b>Region VI (South) - 11</b></u> <ul style="list-style-type: none"> <li><b>U</b> Alabama</li> <li><b>U</b> Florida</li> <li><b>U</b> Georgia</li> <li><b>U</b> Kentucky</li> <li><b>U</b> Louisville</li> <li><b>U</b> Meharry</li> <li><b>U</b> North Carolina</li> <li><b>U</b> Nova Southeastern</li> <li><b>U</b> Puerto Rico</li> <li><b>U</b> South Carolina</li> <li><b>U</b> Virginia</li> </ul>

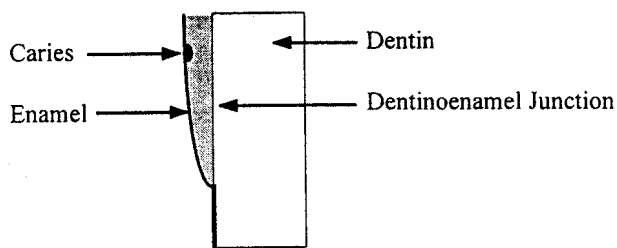
**U** = Paid Member - December 2000

C = Canadian

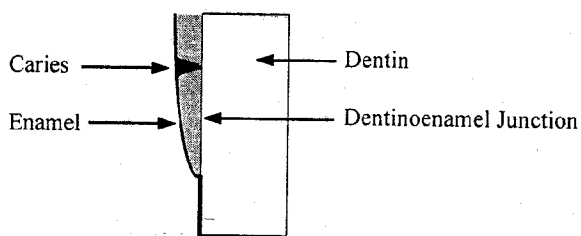
66 Schools (10 Canadian, 56 United States)

## 2000 NATIONAL CODE AGENDA

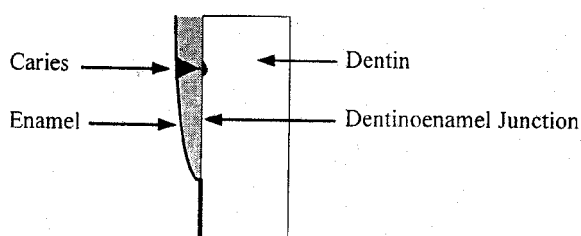
Answers are to be evidence based (please site) where appropriate.



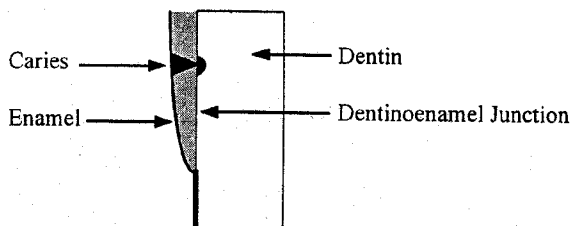
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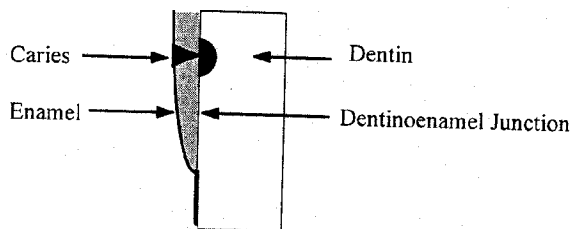
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5.

**From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:**

2. Which diagram represents the point at which a preparation/restoration is indicated?
3. Would the number change/remains the same for a patient of low caries risk? What is the evidence?
4. Would the number change/remains the same for a patient of high caries risk? What is the evidence?  
What is your school's treatment protocol for patients of:
  - a. Low caries risk
  - b. High caries risk
5. Indicate which drawing is minimally acceptable as a board lesion for the dental licensure board at your school/in your region. As several different board examinations may be given, please indicate the drawing and the respective examination.



6. Previous CODE agendas have dealt with caries risk assessment. In addition much is heard about remineralization, minimum intervention, and the use of sealants.  
How is all of this really affecting:
  - a. Decisions to treat
  - b. Preparation designs
  - c. Choice of restorative materials
7. What is the evidence for use of compomers?
  - a.
  - b. How are they being used in clinics?
8. What is the evidence for use of flowable composites?
  - a.
  - b. How are they being used in clinics?
9. What teaching guidelines and materials are used for build-ups?
10. What is the evidence for routine use of cavity sealants with amalgam restorations?
  - a.
  - b. What is the clinical usage?

**Schools are utilizing various levels of simulation in pre-clinical labs. (Heads, torso, computer, Dent Sim, etc., in comparison to "the pole and dentoform.")**

11. Do the sophisticated systems make a difference in the clinical performance?
  - a.
  - b. To what degree, and what is the evidence?
  - c. Report on any controlled studies underway
12. Do the sophisticated systems decrease the amount of time necessary for students to make the transition from pre-clinic lab to clinic?  
By what amount, and what is the evidence?  
Report on any controlled studies underway.
13. What is your school's current utilization level of technology? What is being used and how? (Interactive videos, course web sites, paperless, etc.) Is learning being improved and what is the evidence?

What clinical studies with direct or indirect restorative implications are being conducted at your school? Give a brief description.

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#### **CODE Question:**

For the future, CODE would like to consider a "paperless" directory. The directory would be accessible on our web site.

**Do you support an electronic directory?** Yes **G**No **G**

Comments:

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**Regional Agenda Items** (please report on them)

**Enclosure #1**

**CODE REGIONAL MEETINGS REPORT FORM**

**REGION:** I - (Pacific)

**LOCATION/DATE OF MEETING:**

University of Washington, Seattle, Washington  
October 26-27, 2000

**CHAIRPERSON:**

**Name:** Tar C. Aw

**Phone #:** (206) 543-5948

**Address:** D770 HSB, Box 357456

**Fax #:** (206) 543-7783

Seattle, WA 98195

**E-mail address:** tcaw@u.washington.edu

**LIST OF ATTENDEES: (including Phone #, Fax #, E-mail address - sample format attached)**

See attached.

**SUGGESTED AGENDA ITEMS FOR NEXT YEAR:**

*Faculty shortage, science vs. commerce leading dentistry, teaching all-ceramic restorations, teaching implants, air-abrasion, requirements vs. comprehensive care for clinic patients, changes in curing lights, operative text books, practice management courses, criteria for selecting dental applicants.*

**LOCATION/DATE OF NEXT YEAR'S MEETING:**

**Name:** Dr. Ralph Leung

**Phone #:** (213) 740-1530

**Mailing Address:** 925 West 34<sup>th</sup> St.,

**Fax #:** (213) 740-6778

USC School of Dentistry

**E-mail address:** rleung@hsc.usc.edu

Los Angeles, CA 90089-0641

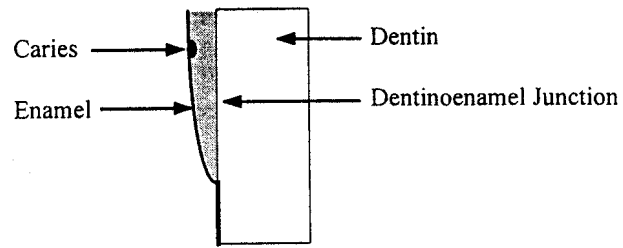
**Date:** TBA

Please return all completed enclosures to Dr. Larry D. Haisch, National Director, UNMC College of Dentistry;  
40<sup>th</sup> and Holdrege Streets; Lincoln, NE 68583-0750. Deadline for return: 30 Days post-meeting  
Office: 402 472-1290 Fax: 402 472-5290 E-mail: LHAISCH@UNMC.edu  
Also send the information on a disk or via e-mail with an attachment,  
indicating the software program and version utilized.

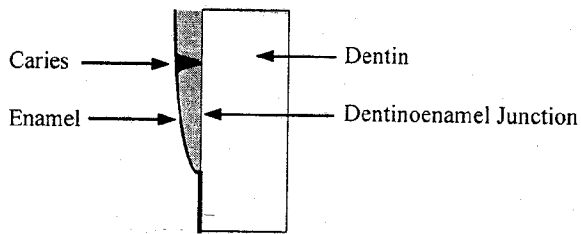


## 2000 NATIONAL CODE AGENDA

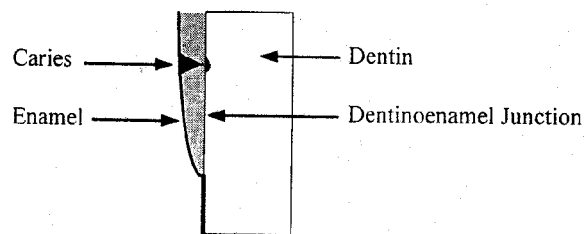
Answers are to be evidence based (please site) where appropriate.



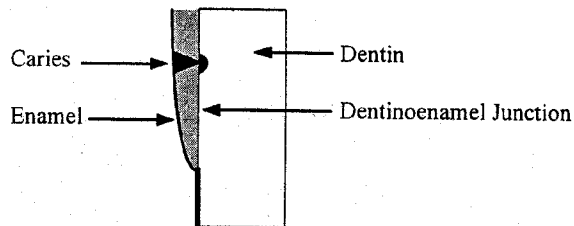
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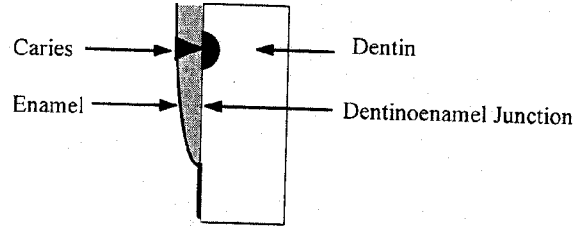
2.



3.



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5.

From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:

## **CODE 2000 Pacific Region I Report**

Summary of the Pacific Region's responses to the National Agenda and the Regional Agenda

### **I. Caries Risk Issues**

**LLU.** Diagram 3 for restoration. For low caries risk, #3 or higher. For high caries risk, #2. Evidence from Dodds, Stoddard. With low caries risk, try Chlorhexidine rinses, aggressive fluoride treatment at #1, 2, 3. With high caries risk, more likely to restore(#3 or higher) or place on short recall intervals. Cal boards states that radiographic lesion needs to penetrate DEJ. Nevada does not state the extent of the radiographic lesion in their criteria, but has indicated a flexibility with benefit of doubt in favor of the candidate.

**UCSF.** Diagram 3 for restoration. Evidence from Featherstone, Eakle. With low caries risk, try fluoride gel, lozenges, emphasize oral hygiene. With high caries risk, more likely to restore(#3 or higher) or place on more frequent recall, more PRR, bonded amalgam, enameloplasty.

**UCLA.** Diagram 2/3 for restoration. Restoration not indicated unless cavitation is detected, may attempt remineralization up to Diagram #4, depending on caries risk. Evidence from U South Carolina Cariology Conference 2000. With high caries risk, more recalls, fluoride.

**OHSU.** Diagram 2 or 3 for restoration. Evidence from Revere, George. With low caries risk, prevention, education, observe, monitor. With high caries risk, more likely to intervene & restore.

**UBC.** Diagram 2 for restoration. No change for low or high caries risk. If non-cavitated, remineralization can be attempted even if radiographically into 1/2 or 1/3 of dentin, up to 0.5 mm into dentin. Moving towards more Caries Risk Assessment - less surgical and more preventive philosophy. Canadian NDEB boards states that minimally #2 will be acceptable.

**UW.** Diagram 2 for restoration. For low caries risk, # 2 or 3. For high caries risk, #2. Evidence from Stoddard, Loesche, cariology texts. With low caries risk, improve home care, change diet, home fluoride, sealants. With high caries risk, same as low caries risk with an addition greater tendency to restore, or increase frequency of prophylaxis/recall, supplemental fluoride, more usage of GI than composite, less complex treatment plan(more removable rather than fixed). Western Regional boards requires a minimum of Diagram #2 radiographically.

**WREB.** Consider radiographic appearance for acceptability, #3 ideal, #2 minimally acceptable, and/or caries is observable by examiner.

### **II. Clinical Treatment Protocols**

**LLU.** Caries Risk Assessment Program - # of frank lesions, # of incipient lesions, # of filled surfaces, treatment history, fluoride use, dietary assessment, xerostomia, medication. More

likely to treat with higher risk, more likely to remineralize and monitor with low risk. With low risk, more likely to monitor at #1, 2, 3, and restore at #4, 5. With high risk, monitor at #1, 2, and restore at #3, 4, 5. Historically, caries risk was not considered in treatment decisions. Current philosophy to assess caries risk, lesion location, potential for progression - remineralize with fluoride where appropriate, perform minimal intervention surgically, composite for smaller lesions and sealants. For preparation design, for composites limited to caries removal and elimination of friable enamel, box preps, combined with sealants on occlusal grooves and pits. Amalgam still material of choice for posterior restorations, and composite for anterior, but within restrictive guidelines, composites as posterior restorations being taught.

**UCSF.** More likely to restore for higher risk. Prep design aims for ideal, essentially board-driven. GV Black design for amalgams, modified for composites. With direct composites, minimal preparation, enamel margins everywhere. DentiCal will not pay for posterior composites.

**UCLA.** More likely to try remineralization with low risk. Currently no Caries Risk Assessment program, but may be implemented in the near future. Amalgam still widely used.

**OHSU.** More intervention with high risk patients. Encourage caries-control, use of glass ionomers, amalgam and gold heavily used. With small lesions in low-risk patients, composite may be used.

**UBC.** Changing emphasis away from surgical to Caries Risk Management, change patients from high risk to low risk. Preparation designs becoming more conservative. Increasing use of composites.

**UW.** Risk assessment of patients for diet, DMXT index, caries history, oral hygiene, prophylaxis/recall intervals, family history, medications, bacterial testing, gingival/plaque index, general health. More intervention with higher risk. Prep design influenced by cleansability, more for caries removal, less 'extension for prevention'. Sealing of adjacent pits and fissures. Amalgam still extensively used for economy and handling. Composites for small preparations and GI for high risk patients. PRR and sealants for low-risk patients.

### **III. Materials Choices and Usage**

**LLU.** Compomers are available and students are taught to use them on root caries. Most typical Class V lesions are being restored with hybrid composite material. Flowable composites are used essentially as dentin liners under posterior composites. A controversy exists on the advantages of flowables but most feel comfortable if the material is used only on dentin, not extending to the margins of the preparation. Class I and PRRs are restored with hybrid composite and sealant. The use of flowables is not being taught as a definitive restorative material. Not every crown preparation requires a build-up. Students are taught the use of amalgams with slots, pins, grooves, boxes and resin adhesives for crown build-ups in their pre-clinical courses. They are also shown how to modify a tooth that has an existing amalgam and to utilize that internal form as part of the crown's retention. Students are also

exposed, in the clinic, to the use of a dual-cured composite material for a build-up foundation. For endodontically treated teeth, we use bonded amalgams(with All-Bond A/B and Panavia) or Fluorocore composite for posterior teeth. Students are taught cast posts for anterior teeth, but will also learn the use of a fiberpost and composite in this year's fixed course. Copal varnish is no longer being taught as a cavity liner. Students, instead, are taught to use a resin liner(All-Bond A/B or 3M's Scotchbond MP) under amalgam.

**UCSF.** GI, Fuji II with Fuji LC liner used - No compomers. DBA used as liners. Aeliteflow used for Class III lesions, in areas of non-occlusal contact. Used sometimes in abfraction lesions as final restorative. Flowables also used for conservative PRRs and liners under composites. For build-ups, amalgam, Fluorocore, P-10. Posterior teeth - bonded amalgam preferred. Also use cast post & core(parapost), and carbon-fiber post. Prime & Bond 2.1 used for cavity sealer, no copalite. DBA used for bonded restorations, otherwise no sealer used.

**UCLA.** GI liner and sandwich technique with overlying composite. Vitrebond used as base/liner. Fuji IX chemical set used for minor blackout. Fuji II LC liner used in preclinic. Poor seal of packables and poor properties of flowables, are reasons they are not used. For buildups, amalgam, blue composite used. Copalite no longer being used as cavity sealer - Optibond used routinely.

**OHSU.** RMGI used in Class V lesions in adults. Vitremer and vitrebond used as liners. GI/resin sandwich restorations. Composites not used for core build-ups. Either cast post & core, or amalgam. Slots, grooves and boxes used for additional retention. No cavity sealer for routine restorations.

**UBC.** Evidence for compomers not very good - RMGI is the preferred term. Used minimally for restorative purposes, other than as liners and luting agents(e.g., 3M Vitremer). Evidence for flowable composites not very good. Used for repair of restorative margin defects, and as a base for deeper composite resin restorations. In agreement between operative and fixed prosthodontics, silver amalgam is generally preferred as a build-up. Composite core build-up materials can also be used, particularly where cohesive strength of the material is not an issue. Evidence for sealing of dentin is pretty good. Clinical usage (of Scotchbond MP) nearly 100 percent - no sealer for non-vital teeth.

**UW.** Current evidence for compomers is mixed, purportedly more flexible, with better physical properties and esthetics than GI. Also, has fluoride release. Used mainly for Class V restorations. Current evidence is not favorable - very low-filled composites, with poor physical properties, high shrinkage. Good for PRR or sealants, or small restorations that are difficult to place. Amalgam still the default choice for build-ups, composite also used where bonding is desirable, and immediate prepping is necessary. Evidence for DBA as sealants is good, from JADA reports. Copalite being phased out - either nothing is used as liner, or All-Bond A/B for deep preps, and All-Bond A/B with etching for bonded restorations.

#### **IV. Preclinical Simulation and Technology Utilization**

**LLU.** Phantom heads on poles, and bench-top dentoforms being used. Students do not appear to have too difficult a time transitioning into the clinic. The cost and available space prohibits from switching to a more sophisticated system at this time. In the past, all preclinical projects were performed on the bench-top, and did find that it impeded the transition process to the clinic. There is a mix of presentation formats from PowerPoint to slides to overheads. Now in the process of upgrading two auditoriums to accommodate the use of laptops by the students, which will facilitate the transition to a paperless format. The CE department has a course on implantology which is web-based.

**UCSF.** Mannequin head on a posts and/or dentoforms on bench-tops used. Laptops and PowerPoint presentations are used selectively, depending on faculty preference. Individual initiative to use digital cameras, intraoral cameras, and CD-ROM media.

**UCLA.** Renovation of the preclinic lab is in progress, upgrading the facilities to, likely, a combination simulation plus bench lab. There exist on-line courses, video support, case presentations via computer. Laptops in the future.

**OHSU.** Typodont and stone-mounted extracted teeth, prepared in a bench laboratory setting. Small group of faculty using technology, with A/V and computer connections available in some classrooms, with others using slides and overheads. Computer-support staff is available.

**UHC.** That depends on how the systems are used. Most systems will allow introduction of the clinical skills with high clinical ergonomic integrity and fidelity. If the teaching program does not reinforce these areas, either preclinically or clinically, or if the clinical or simulation equipment does not allow for high clinical ergonomic integrity and fidelity, then there can be crossover problems and integration problems that neutralize any value that might have been derived from the additional costs of more realistic tissue mock-ups.

Just completed (this month) a major study based on UBC graduates over a 12-year period, and the evidence is substantial that the dedicated simulation training (based on a performance logic clinical ergonomics model) resulted in significant differences in the clinical performance of the graduate practitioners when compared to a control group of graduates from other institutions who practiced in the same jurisdiction. Otherwise studies of the effect of the more sophisticated systems are few and largely insubstantial. In addition UBC has completed the integration of clinical simulation into the clinics. Thus far, this move seems to have garnered much success in streamlining the seamless progress from what was formerly termed "preclinical skills" to full clinical operation.

At UBC, transition time is reduced, but the greater variables are clearly in the way in which any of the systems are used. Because the introduction of a dedicated simulation laboratory(1981) and integrated clinical simulation(1998) have occurred amidst curricular change, faculty change, materials change, and changes in treatment protocols, it is difficult to know what portion of increased efficiency in clinical simulation training might be attributed to teaching hardware.

Using Web-based course materials(WebCT) for both operative clinical simulation courses. This encourages students to take advantage of Web-based resources(manufacturer's materials sites, faculty intranet references, etc.), and allows great flexibility in course



organization, with two provisos: first, someone must take the time and trouble to mount the Web-based course and, second, someone must maintain that course. As for simulation hardware, other teaching technologies are also tools. They are tools and aids to teaching, but are not substitutes for teaching. It is too early to judge the overall success of most of these tools. Several educational research projects are underway, but these are expected to be more descriptive than analytical and comparative during the next few years.

**UW.** The extent to which sophisticated simulation at the preclinical level impacts upon clinical performance is unclear. There are more anecdotal and empirical observations than hard evidence. But there is a prevailing intuitive notion that it should produce better outcomes than the simpler, older "pole & dentoform". This belief stems from training in other fields involving manual dexterity and motor skills, that the better you can simulate the working conditions, the better the performance when confronted by the actual situation, including repetition, recognition and patterning. There are few, if any, studies that specifically address simulation in the dental environment. It is also difficult to isolate and prove conclusively that any effect is attributable solely to the improvements in simulation technology. At this point, faculty observations and subjective feedback from students would indicate a favorable, if qualified, approval of the simulation units(torso, head, cheeks). It is perceived that the transition from preclinic to performing clinical procedures on live patients is easier than before, but whether this is actually so is unproven. What variables to measure, how to measure, objective evaluation criteria have to be established before any study can be conducted to provide validated evidence on this issue.

Whether it actually decreases the amount of time for the transition into the clinic is also unknown. If sophistication means simulation of greater fidelity and realism, ability to integrate simulation into the curriculum earlier, more capacity for repetition and practice, then any problems that can be corrected prior to the clinic instead of during clinic should result in a savings in time and also improved results. Once again, hard evidence is sparse, and studies are planned but none underway at the moment. No doubt, as simulation technology becomes ever more sophisticated, and expensive, there will be increased scrutiny of cost-benefit-risk issues before fully embracing and upgrading to the newest version.

Currently, paper syllabi are still the standard, but some are transitioning to CD-ROMS and websites, with the more routine, unchanging material on CD-ROM, and material that requires frequent revision and updating on the website. The downsides are the cost, computer support and time required to set up and maintain such tools.

## **V. Studies with Restorative Implications**

**LLU.** Class II composite(Vivadent), Artglass crowns.

**UW.** Single bottle DBA, Empress II crowns, Plasma-Arc light curing, Implant fatigue, Packable composites.

### **CODE Question:**

For the future, CODE would like to consider a "paperless" directory. The directory would be accessible on our web site.

**Do you support an electronic directory?      Yes ?No ?**

Comments:

All members were in favor of an electronic directory, with the advantages that it would be easily updateable, save on paper and mailing costs, could be printed if needed. The disadvantages would be that if there are any computer server problems, the directory would be unavailable, that it would be inaccessible without a computer, needs time and funds to upkeep and maintain a host site.

### **Regional Agenda Items** (please report on them)

It was unanimously felt that if commercial interests wished to sponsor CODE meetings, it would be acceptable. However, it was felt that their participation should be limited to having informational literature present, or having a representative do a short presentation, but definitely NOT allow them to sit in on the meetings and discussion. We again reiterate that the presence of representatives of clinical board exams is very beneficial, and fully recommend extending invitations to the relevant regional boards. Region I had a representative from the Western Regional Board, Dr. Daryl Miller, in attendance and have had a WREB member present for the past several CODE meetings. The Nevada State Board of Dental Examiners has indicated an interest in attending. In that vein, we also would like the National CODE office to consider inviting the soon-to-be UNLV-Nevada Operative Dentistry division to join CODE Region I. We revisited the recurring issue of also including Hawaii in our region, which was again unanimously passed, having carefully considered all the ramifications and the arduous task of holding a meeting so far offshore, but if so designated, we will accept that charge.

## CODE Region I Attendees

[illegible]

**Enclosure #1**  
**CODE REGIONAL MEETINGS REPORT FORM**

**REGION:**        II (Midwest)

**LOCATION/DATE OF MEETING:**

UMKC School of Dentistry  
September 18, 19, 2000

**CHAIRPERSON:**

**Name:**     John Killip

**Phone #:**   (816) 235-2100

**Address:**   UMKC School of Dentistry

**Fax #:**       (816) 235-2157

650 E. 25<sup>th</sup> Street

**E-mail address:** killipj@umkc.edu

Kansas City, MO 64108-2748

**LIST OF ATTENDEES:** (including Phone #, Fax #, E-mail address - sample format attached)

Attached

**SUGGESTED AGENDA ITEMS FOR NEXT YEAR:**

**LOCATION/DATE OF NEXT YEAR'S MEETING:**

**Name:**       William Brackett

**Phone #:**    (402) 472-9846

**Mailing Address:**   UNMC College of Dentistry

**Fax #:**       (402) 472-5290

40<sup>th</sup> & Holdrege Streets

**E-mail address:**   wbrackett@unmc.edu

Lincoln, Ne 68583-0750

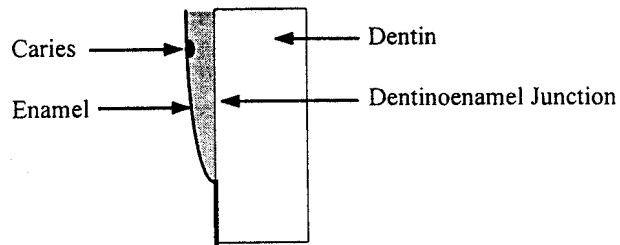
**Date:**       September 25, 25, 2001

Please return all completed enclosures to Dr. Larry D. Haisch, National Director, UNMC College of Dentistry;  
40<sup>th</sup> and Holdrege Streets; Lincoln, NE 68583-0750. Deadline for return: 30 Days post-meeting  
Office: 402 472-1290    Fax: 402 472-5290    E-mail: LHAISCH@UNMC.edu  
Also send the information on a disk or via e-mail with an attachment,  
indicating the software program and version utilized.

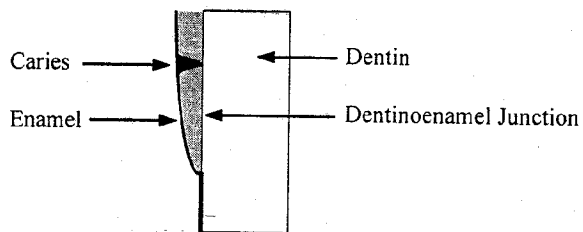


## 2000 NATIONAL CODE AGENDA

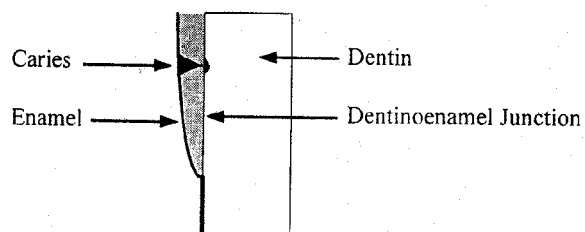
Answers are to be evidence based (please site) where appropriate.



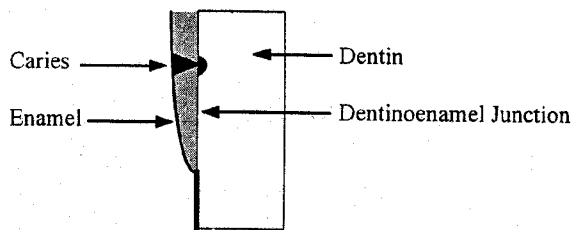
1.



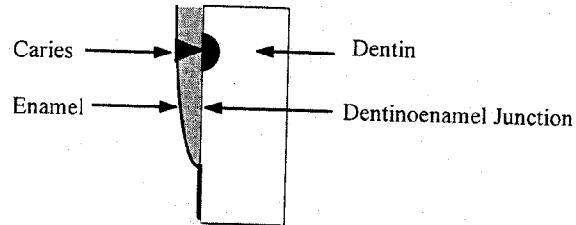
2.



3.



4.



5.

**From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:**

## 2000 NATIONAL CODE AGENDA

Answers are to be evidence based (please site) where appropriate.

From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following?:

Neb.	University of Nebraska	Cre.	Creighton
Minn.	University of Minnesota	Iowa	University of Iowa
Colo.	University of Colorado	SIU	Southern Illinois University
UMKC	University of Missouri at Kansas City		

**1. Which diagram represents the point at which a preparation/restoration is indicated?**

Need more than one radiograph and patient history.

**Neb.** Insufficient information given to answer, but probably 2 or 3 (see below)

**UMKC.** Diagram #2 where the caries is to the DEJ for a patient with active caries history or one with numerous interproximal lesions. Or a #3 for an older patient. Normally the lesion should be restored when the caries is to the dentin. (#3).<sup>1,2</sup>

Anusavice, K.J. Symposium summary statements, criteria, and recommendations. In Proceedings, Quality Evaluation of Dental Restorations: Criteria for Placement and Replacement. Anusavice, KJ ed. Chicago. Quintessence Publishing Co., Inc., pp. 411-415, 1989.

Woodward, GL; Leake, JL. The use of dental radiographs to estimate the probability of cavitation of carious interproximal lesions part I: Evidence from the Literature, Journal of the Canadian Association, Vol 62(9) 731-736. 1996.

**Minn.** #4 (D1) Outer 1/3 of dentin

**Iowa.** Diagram 3 or 4: Depends on Caries risk and activity and if a caries control program is in place with therapies to remineralize and ongoing monitoring.

**SIU.** #2

**2. Would the number change/remain the same for a patient of low caries risk? What is the evidence?**

**Neb.** Change. There is no way to discern the activity of a carious lesion from a single radiograph, and no studies extant on progression of lesions relative to caries risk factors, but in the absence of cariogenic flora, there is a reasonable chance that a lesion radiographically confined to enamel is inactive.

**UMKC.** If in the dentin no, one should restore the lesion. If confined to the inner enamel one should wait. It can take 3-4 years for a lesion to move through the enamel.<sup>3,4,5,6</sup> "Progression

towards severe caries involvement is not rapid in the great majority of cases but by contrast the appearance of an initial enamel lesion is prompt."

**References:**

Berman, DS; Slack, GL; Caries progression and activity in approximal tooth surfaces, a longitudinal study. Brit Dent J, 1973 134(51) Jan 16 (2) 51-57.

Pitts, NB. Monitoring caries progression in the permanent and primary posterior approximal enamel by bitewing radiography; A review. Community Dent Oral Epidemiol 11:228-235, 1983.

Shwartz, M, Grondahl, H, Pliskin, JS et al. A longitudinal analysis from bitewing radiographs of the rate of progression of approximal carious lesions through human dental enamel. Arch Oral Biol 29: 529-536, 1984.

Woodward, GL; Leake, JL. The use of dental radiographs to estimate the probability of cavitation of carious interproximal lesions part I: Evidence from the Literature, Journal of the Canadian Association, Vol 62(9) 731-736. 1996.

**Minn.** A patient with a lesion into dentin is not considered to be low caries risk.

**Cre.** 2 or 3

**Colo.** Mostly 4; sometimes 3

**Iowa** Ideally it would change to Diagram 4 or 5 with remineralization therapies, however this is not happening currently in the dental school.

Burke FT. When is caries caries, and what should we do about it? Quintessence International; 29:668-672.

Anusavice KJ, 1997. Efficacy of nonsurgical management of the initial caries lesion . J Dent Educ; 61:895-905.

Kidd EAM. The diagnosis and management of the early carious lesion in permanent teeth. Dental Update 1994; 11:69-80.

Bader JD. Dilemmas in caries diagnosis. JADA, 1993; 124:48-50.

Pitts, NB. Patient caries status in the context of practical, evidence-based management of the initial caries lesion. Jn Dent Educ 1997; 61:861-865

Radike AW. Criteria for diagnosis of dental caries. Proceedings: conference on the clinical testing of cariostatic agents, Chicago, 1968.

**SIU.** The number would remain the same for a person with low caries risk.

**3. Would the number change/remain the same for a patient of high caries risk?  
What is the evidence?**

**Neb.** Wouldn't change. Although it is acknowledged that histologic caries progression is more advanced than the radiograph, it is still possible to arrest minimal lesions if the high-risk patient makes changes to reduce his risk.



**UMKC.** If the person is younger and has poor home care and diet is not changed then restore the most severe lesion and work backwards to the least severe. Based upon findings when the most severe lesion is restored will then help determine how to treat the least severe lesions. The bottom line is to not treat enamel lesions at the first appointment since it may take up to 3-4 years for the lesion to progress to the dentin. Re-evaluate the patient on recall. (This is common sense).

Bille, J; Thylstrup, A. Radiographic Diagnosis and clinical tissue changes in relation to treatment of approximal carious lesions. Caries Research 16:1-6, 1982.

**Minn.** A patient with a lesion into dentin is already at high caries risk.

**Cre.** For low caries risk, #3 would be the standard. Remineralization of the enamel is a well-documented and observed phenomenon. For a pt. with good OH, a chance for remineralization would be preferred with a lesion as pictured in #2.

**Colo.** Treatment would be most likely rendered when diagram 4 is encountered.

**Iowa.** Change. Restoration would be defect specific but earlier intervention (3). However caries control program would be implemented immediately and reassessment done. Do the worst lesions first and if patient complies we can monitor lesions such as (2).

**SIU.** The number would remain the same.

**What is your school's treatment protocol for patients of:**

**A. Low caries risk**

**Neb.** Assuming the patient does have caries, but currently has low risk factors, restoration only with demonstrable progression of lesions to dentin, increased fluoride use if there are early lesions with the potential for remineralization.

**UMKC.** Low caries risk - treat the lesion when it is in the dentin. Do patient education of the causes of caries. Bacteria, what you eat, the frequency of eating. Flossing instructions, diet reminders, use a fluoride toothpaste. Tell them to keep up the good work.

**Minn.** Very conservative. When in doubt, don't cut.

**Cre.** For a high caries risk pt., #2 would be the practice. Six months to a year later would be too long to observe for signs of improved OH, and progression of the lesion would be too far advanced.

**Colo.** Risk assessment; restoration of lesions of diagram 4 or greater; preventive and reversal intervention; planned reassessment and evaluation of compliance. Changes in therapy depending on assessment.

**Iowa.** Low Caries Risk:

Address relevant risk factors  
Review diet  
Fluoride dentifrice

**SIU.** Restoration of carious lesions and oral hygiene instructions. The exact protocol remains instructor specific.

**B. High caries risk**

**Neb.** Home use and office fluoride, chlorhexidine, dietary counseling, increased frequency of bitewing radiographs, restorations, follow-up microbial testing to evaluate effectiveness of the preceding.

**UMKC.** Treat the lesion definitely in the dentin first, then based upon actual findings (if not very progressed wait till other lesions reach the dentin if more progressed then treat the next lesion that is at the DEJ.) After treating the most severe lesion at the DEJ then based upon what is seen when restoring the tooth then either treat lesions in enamel or wait for progression upon recall.

Recall at 3-6 months. Chlorhexidine rinse (½ ounce) before bedtime for 2 weeks. Prevident, fluoride rinse after using Chlorhexidine rinse. Four day diet analysis (Thursday, Friday, Saturday, Sunday) brushing and flossing instructions, plaque control. Motivate patient to take responsibility for their disease, its cause and prevention.

Anderson, MH; Bales, D; Omnell, K. Modern Management of dental caries: The cutting edge is not the dental bur, JADA 124 (June 1993) 37-44.

**Minn.** Chlorhexidine, diet modification, fluoride. More aggressive restorative treatment in questionable areas.

**Cre.** Teach good OH practices. Stress brushing AND flossing. Discuss dietary habits. Prescribe fluoride gel or rinse as an adjunctive aid to brushing AND flossing.

**Colo.** Risk assessment; infection evaluation; dietary evaluation and correction; restoration of lesions of diagram 3 or greater; pit and fissure sealants; preventive and reversal intervention; planned reassessment and evaluation of compliance; infection control evaluation. Changes in therapy depending on assessment.

**Iowa.** Address relevant risk factors

Diet analysis/modification

Fluoride dentifrice

PreviDent 5000 Plus or fluoride rinse (Rx)

**SIU.** Restoration of carious lesions, oral hygiene instructions, some nutritional counseling and prescription of Prevident 5000 toothpaste.

**4. Indicate which drawing is minimally acceptable as a board lesion for the dental licensure board at your school/in your region. As several different board examinations may be given, please indicate the drawing and the respective examination.**

**Neb.** 1 - WREB 2 - CRDTS

**UMKC.** CRDTS #2. Caries to the DEJ.

**Minn.** #3 CRDTS

**Colo.** CRDTS would like diagram 3 but accepts 2. WREB would like diagram 3 but accepts 2

**Iowa.** 2 for CRDTS and 3 for WREB

**SIU** 2 is minimally acceptable for CRDTS which is offered at our school.

**5. Previous CODE agendas have dealt with caries risk assessment. In addition much is heard about remineralization, minimum intervention, and the use of sealants.**

**How is all of this really affecting:**

**A. Decisions to treat assuming this means cut on the tooth.**

**Neb.** Likelihood of restoration is decreased if caries risk is determined to be low.

**UMKC.** Response to parts a and b:

At the present time there are few aspects in the restorative clinical curriculum which reflect direct response to caries risk assessment. We are making a positive move to evoke positive change which will affect caries education in the preclinical years, clinical caries risk assessment using a definitive caries risk scale (similar to that of the University of Florida), and a more conservative approach to clinical treatment of caries confined within the enamel layer. Faculty education is going to be one of the keys to the implementation of this approach.

**Minn.** (Assume this means decisions to cut): Much more conservative with low caries risk patients.

**Cre.** With low caries risk, remineralization using prescription fluoride is given a chance (6-12 months) before treatment.

**Colo.** Smaller lesions are not treated without evidence that it is in the best interest of the patient. In the past all lesions of a certain size were treated without regard to risk assessment. Fewer lesions are being treated and more emphasis is being placed on prevention and reversal opportunities. Occlusal lesions are more likely to be sealed or minimal preparations to reduce the risk of excessively cutting false positives. Class V lesions are not aggressively restored; usually a bonded restoration or surface sealing.

**Iowa.** More conservative in choosing when to restore, more preventive therapies,

**SIU.** More preventive resin restorations and 'amalgam repairs' are now being done in our student clinics.

## **B. Preparation designs**

**Neb.** Unchanged, as minimal extension is routinely employed.

**Minn.** High risk patient: Margins are extended past proximal contact for examination at recall

**Colo.** The preparation is primarily designed based on the lesion. The extent of the caries; the establishment of a sound margin; and consideration for resistance and retention are the design goals. Next, the design is modified based on the restorative material to be used (which is not determined before hand).

**Iowa.** Defect specific restoration and repairs

**SIU.** More defect-specific preparations are not being done in our clinics.

## **C. Choice of restorative materials**

**Neb.** Increased use of glass ionomers for root surface restorations in high risk patients.

**UMKC.** Restorative materials involved will be Fugii-9, Dyract, President 5000 and fissure sealants.

**Minn.** Sealants are for high risk patients with deep fissures. Glass ionomers may be used for cervical restorations in high risk patients rather than composite resin.

**Cre.** With a preventive resin preparation design, only the carious pit/groove is prepped, followed by a composite restorative and P.S. over the remaining occlusal surface.

**Colo.** The restorative material is selected based on the preparation design; patient needs; and the physical properties and limitations of the material. Materials are not chosen first and then a preparation made to match.

**Iowa.** More adhesive and/or fluoride releasing restorative materials

**SIU.** Amalgam is still the material of choice for posterior restorations. However, more preventive resin restorations are being done in posterior teeth.

## **6. What is the evidence for use of compomers?**

**Neb.** No evidence supports their use over resin composite or resin-modified glass ionomer

**UMKC.** None

**Minn.** None, not used in clinics.

**Cre.** Compomers have been shown to possess acceptable adhesion to dentin and enamel (10-20 MPas) while also releasing fluoride.

**Colo.** We do not use compomers for operative treatment because we do not believe there is evidence to support their superiority over other materials in the same situation.

**Iowa.** Little to none

Duke, Oper Dent, 1999, 24:258-260.

Tyas, Oper Dent, 1998, 23:77-80.

Burgess et al., Compendium, 1996, 17(8):731-748.

**SIU.** There is no good evidence to support the use of compomers.

#### **A. How are they being used in clinics?**

**Neb.** Not being used.

**UMKC.** We are not using them clinically

**Minn.** None, not used in clinics.

**Cre.** They are used to restore Class Vs (especially root surfaces) more often for high caries risk patients.

**Colo.** They are not used.

**Iowa.** We did for a couple of years now we don't

**SIU.** We are not using compomers in our clinic.

### **7. What is the evidence for use of flowable composites?**

**Neb.** In vitro leakage and polymerization-stress studies indicate improved marginal adaptation, but no corroborating clinical studies are available. Practicality would dictate the flowable be the primer/adhesive, to avoid an additional step, but single-component primer/adhesives do not appear to be the equal of sequential products in vitro.

**UMKC.** None

**Cre.** Limited

**Colo.** No direct evidence to support the use of flowable composites. Only anecdotal based on minimally invasive concepts.

**Iowa.** Flowables are promoted due to their increased elasticity and wettability or adaptability to cavity walls. The elastic wall concept is theory with some evidence but still theory and not

fact. Flowables will adapt better to cavity walls with fewer voids and defects but no evidence exists that demonstrates improved clinical performance.

**SIU.** There is no evidence that flowable composites reduce microleakage when used as bases under Class II composite resin restorations. They have been shown to reduce post-operative sensitivity and/or marginal voids in proximal boxes when using packable composites for restoration in some studies. (Frankenberger et al., 1999)

#### **A. How are they being used in clinics?**

**Neb.** Not being used.

**UMKC.** We are not using them clinically

**Cre.** They are sometimes used as an initial increment in a Class I or II posterior composite to assure close adaptation to the dentin. More commonly, they are used to restore small Class V lesions or in lieu of a sealant.

**Colo.** Very limited use. Mainly for very small occlusal preparations for which composite and amalgam is not indicated and in some class V lesions or defects.

**Iowa.** - preventive resin restorations (i.e., Minimal Class I restorations)  
- liners or 1st increment in selected resin composite restorations  
- repair materials for bis-acryl composite temporary materials

**SIU.** They are being used for preventive resin restorations and in lieu of surface penetrating sealants for posterior composites. They are not being used for Class V restorations due to their poor handling characteristics (difficult to control).

#### **8. What teaching guidelines and materials are used for build-ups? Clarify term build Up-restoration that serves as a foundation for a future crown. Must provide some of the retention for the crown. Blocking out undercuts.**

**Neb.** When there is minimal dentin remaining, and particularly if crown preparations are to be done at a subsequent appointment, amalgam is preferred. For preparations where there is considerable dentin remaining, resin composites are preferred.

**UMKC.** We teach that the strongest material should be used when there is little remaining tooth structure (amalgam often with pins), if there is some remaining tooth structure (2 or more walls) composite is acceptable, when there is only minimal missing tooth structure core-paste and/or, a reinforced resin (Ketac-silver) is acceptable.

Posts: We use prefabricated post systems extensively because there is no evidence that cast posts are truly clinically superior to prefabricated alloy posts. Only 10% of practicing clinicians use cast posts. The core material suggested with the prefabricated post systems are hybrid composites when the crown will have a positive long margin (2 mm or more) on sound tooth structure.

**Minn.** Primarily amalgam - assuming build-up is to provide additional retention and resistance where inadequate tooth structure exists.

**Cre.** SA is preferred for buildups with presumably better tensile strength than composite.

**Colo.** We teach that build-ups are foundation restorations for crowns. As such we select materials which will anchor securely to the tooth and provide adequate resistance and retention form for the crown preparation. Our first choice is amalgam with supplemental pin retention. Generally, the more the tooth structure missing the more likely that amalgam will be used. We also have a composite as a secondary build material. This material is to be used when moderate to minor build-up of missing tooth structure is indicated but there is sufficient remaining tooth so that the composite is not the sole source of resistance and retention form.

**Iowa.** Amalgam primarily still used:

When adequate tooth structure remains

Posterior light cured composite

Self cure composite/ single bottle adhesive incompatibility?

Some glass ionomer (Fuji IX or RMGI) for small areas or block out.

**SIU.** Amalgam only

## **9. What is the evidence for routine use of cavity sealants with amalgam restorations?**

**Neb.** No evidence supports that use of any sealant increases the longevity of routine amalgam restorations. Clinical studies have demonstrated decreased postoperative sensitivity when resin liners are used prior to amalgam.

**UMKC.** None

**Minn.** Biological and mechanical advantages. Biological advantage evidence is good but evidence of a mechanical advantage is inconclusive.

**Cre.** Sketchy. The evidence seems to reflect no advantage between copalite, adhesive, or no liner.

**Colo.** The answer depends on what the definition of sealant is and what material is used. The sealing of dentinal tubules seems to be most important regardless of the restorative material. This is based on the work of Cox and others. There is little long-term clinical evidence to determine the effects of sealants under amalgam compared to restorations placed without.

**Iowa.** Lab studies: reduced microleakage, increased bond strength, fracture toughness.

Cobb DS et al. Amalgam shear bond strength to dentin using single-bottle primer/adhesive system. 1999; 12:222-226. (Many references in this article).

Clinical: no reduction in post-op sensitivity or retention, fracture

Mahler et al, 2000. Clinical evaluation of amalgam bonding in class I and II restorations. JADA;131:43-49.

**SIU.** No unequivocal evidence

**A. What is the clinical usage?**

**Neb.** No sealant used prior to routine amalgam restorations.

**UMKC.** We are not using them clinically (Comment: there may be an application in a conservation approach to amalgam treatment vs. replacement, and this merits further evaluation)

**Minn.** We use it for "bonding" not just "sealing" in teeth where compromised cusp or cusps remain and/or there is pulpal encroachment.

**Cre.** Copalite, adhesive, and no liner are all practiced.

**Colo.** We use a single component resin-bonding agent under all amalgam restorations unless isolation is inadequate to do so.

**Iowa.** We use it routinely.

**SIU.** We are discontinuing routine use of cavity varnishes in favor of amalgam bonding material (Bond-it) this year.

**Schools are utilizing various levels of simulation in pre-clinical labs. (Heads, torso, computer, Dent Sim, etc., in comparison to "the pole and dentoform."**

**10. Do the sophisticated systems make a difference in the clinical performance?**

**Neb.** NA.

**UMKC.** Dent Sim-is in very limited usage. Our preclinical experience is based on Heads, cheeks and typodonts on the pole.

**Minn.** Unknown

**Cre.** NA

**Colo.** We do not have these systems at this time.

**Iowa.** Yes. Students are better prepared when they first see patients. They do more procedures in less time and have better operating posture and skills. (ex. Maxillary mirror skills)



**SIU.** We are not using any sophisticated systems at this point of time, only heads on poles and an elmo for demonstrations. Each student has their own monitor for viewing the demonstrations.

**A. To what degree, and what is the evidence?**

**Neb.** NA

**Cre.** NA

**Colo.** We do not use these systems

**Iowa.** Faculty observation of students who have had pre-clinical Operative taught in the Simulation facility

**B. Report on any controlled studies underway**

**Neb.** NA.

**UMKC.** Check in with Judith Buchannan from University of Pennsylvania.

**Minn.** Unknown

**Colo.** Judith Buchannan and colleagues at Penn have preformed and are preforming research in this area.

**Iowa.** Reinhardt, J. et al., (In preparation, 2000). Effect of Simulation Clinic Training on Standardized Operative Dentistry Examination Performance.

-Students scored higher on mannequin prep just prior to seeing first patients when they had been through the Simulation Clinic for pre-clinical Operative.

**11. Do the sophisticated systems decrease the amount of time necessary for students to make the transition from pre-clinic lab to clinic?**

**Neb.** NA.

**Colo.** We hope, but do not know.

**Iowa.** Students required less time to learn Operative preps using Dental Simulation  
Buchanan, J et al. Use of Virtual Reality Based Technology in Teaching Dental Operative Procedures.  
J Dent Ed. 64:227 (Abstr 202), 2000.

**A. By what amount, and what is the evidence?**

**Neb.** NA.

**Colo.** Unknown

**Iowa.** See above reference

## **B. Report on any controlled studies underway**

**Colo.** See 10 c.

**12. What is your school's current utilization level of technology? What is being used and how? (Interactive videos, course web sites, paperless, etc.) Is learning being improved and what is the evidence?**

**Minn.** Course web site is used for 3rd year course. No evidence collected to show improved learning.

**Cre.** More and more lecture courses are computer generated (Powerpoint, Gizmos, etc.) with clinical slides incorporated into the presentation. Some lectures are available on the Web. Videos of specific procedures are also used.

**Colo.** We have just formed an Informatics Committee. One charge of this committee is to place about 25% of the curriculum "online" in some format. The first course was introduced this month with several others to be introduced in January 2001. Students will be required to purchase laptop computers in Sept 2001. We are constructing a state-of-the-art dental simulation clinic that will be completed in November 2000. We do not know if learning will be improved, we hope so. We do believe that this is the direction education is going and should go.

**Iowa.** Our school is increasingly utilizing digital computerized presentations. Included in this are Powerpoint presentations given by the faculty which are later web based for independent student viewing. Live demonstrations are now possible with the new simulation clinic. Specific areas include:

- Interactive case diagnosis and treatment planning
- Interactive video presentations in dental anatomy
- Web based availability of all Sophomore clinical presentations
- Junior and graduate seminars presented utilizing Powerpoint.
- Live demonstrations via cameras and monitors in preclinical operative dentistry.
- Live demonstrations used in the simulation clinic for teaching cosmetic dentistry to junior and senior dental student.

Students will be issued laptops starting next year which will be the first step to a paperless preclinical as well as clinic program. A new demonstration operatory is in progress which will serve as a live patient demonstration experience for students both directly and via monitors.

**SIU.** We are not using any interactive videos or web based courses at this point of time.

**What clinical studies with direct or indirect restorative implications are being conducted at your school? Give a brief description.**

**Minn.** Hildebrandt (JADA) xylitol chewing gum study showed sustained lowered MS counts for longer period than Chlorhexidine.

**Cre.** Liner study using Copalite, adhesive, or no liner into ideal Class II SA cavity preps.

**Colo.** We have no studies at this time.

**Iowa.** Three year study on a new luting cement  
Class V study using a self-etching system  
Class I study using a self-etching system  
Clinical comparison of a self-etching system with a conventional primer-adhesive system

**CODE Question:**

For the future, CODE would like to consider a "paperless" directory. The directory would be accessible on our web site.

**Do you support an electronic directory?      Yes ? No ?**

**Neb.** Yes

**UMKC.** Yes

**Minn.** Yes

**Cre.** Yes

**Colo.** Yes

**Iowa.** Yes

**SIU.** Yes

**Regional Agenda Items** (please report on them)

Commercial support of regional CODE meetings:

The discussion was centered on the concept of commercial exhibitors providing support for a meal in exchange for time to promote their products. At the meeting this seemed like a feasible idea.

(UMKC had asked Dent-Sim representatives to attend the meeting, but they did not provide financial support)

After the meeting, Poonan Jain of SIU very eloquently expressed the opinion that at this time it does not seem to be a necessity to solicit financial support. The true value of the meeting is the interaction between our peer operative faculty members.

**NOTES!** Conservative-doing that which only needs to be done to solve the problem. Does not necessarily mean small. Could be more conservative to cut than to consider remineralization. Consumer does not have the attitude to buy into the preventive procedures. Remuneration is for work you do not what you don't provide-Enamel and remineralization have changed. Dentin is still the susceptible tissue. Student experiences to include non-surgical as well as surgical treatment.

## CODE KC 2000 LIST OF ATTENDEES

NAME	SCHOOL AFFILIATION
Dr. Larry D. Haisch	University of Nebraska
Dr. Henry St. Germain	University of Nebraska
Dr. William Brackett	University of Nebraska
Dr. Poonam Jain	Southern Illinois University
Dr. Debra Schwenk	Southern Illinois University
Dr. R. Scott Shaddy	Creighton University
Dr. William T. Naughton	Creighton University
Dr. Deb Cobb	University of Iowa
Dr. Gerald Denehy	University of Iowa
Dr. Craig Passon	University of Colorado
Dr. Craig Phair	University of Minnesota
Dr. John W. Killip	UMKC
Dr. Susan McMillen	UMKC
Dr. Jerry Woolsey	UMKC
Dr. John Purk	UMKC
Dr. Brian Williams	UMKC
Dr. Greg Johnson	UMKC
Dr. David Moore	UMKC
Dr. Ashling O'Mahoney	UMKC
Dr. Cynthia S. Petrie	UMKC
Dr. Michael Reed	UMKC
Mr. Dov Baruch	Dent Sim
Dr. Shlomo Lehavi	Dent Sim

### Social Guests:

Dr. Marge Smelston, Dr. Laurence Kaptain, Dr. Nancy Addy, Mary Helen and Charles Schooley, Mary Lee Woolsey, Howard Petrie, Patty Purk, Janelle Moore, Kathy Killip and various Killip family members.

**Enclosure #1**  
**CODE REGIONAL MEETINGS REPORT FORM**

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**REGION:**     III (South Midwest)

**LOCATION/DATE OF MEETING:**

University of Oklahoma College of Dentistry  
Oklahoma City, Oklahoma 73190  
November 2 - 3, 2000

**CHAIRPERSON:**

**Name:**     Terry Fruits  
**Address:** 1001 Stanton L Young Blvd  
                 Oklahoma City, Ok 73190

**Phone #:** (405) 271-5735  
**Fax #:** (405) 271-3423  
**E-mail address:** terry-fruits@ouhsc.edu

**LIST OF ATTENDEES:** (including Phone #, Fax #, E-mail address - sample format attached)

See attached.

**SUGGESTED AGENDA ITEMS FOR NEXT YEAR:**

- Should we be utilizing uni-dose application packaging for all products used in our clinical procedures ?
- Describe the design of Class II cavity preparations used for composite restorations at your school.
- What methods can we use to standardize our faculty's teaching philosophies/techniques, and assure that once new techniques are adopted by our schools they are employed by all faculty members ?
- What are the pros and cons for evidence based dentistry in regard to its impact on the exposure to liability for the private practitioner (Could heavy emphasis on evidence based dentistry eventually result in such strict standard of care that it may increase the liability exposure or practitioners if they do not utilize only the materials and techniques identified by systematic literature reviews?)

**LOCATION/DATE OF NEXT YEAR'S MEETING:**

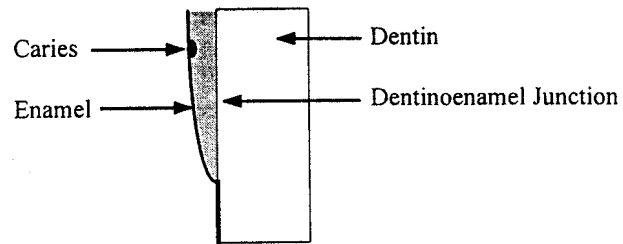
**Name:**     E. W. "Ned" Turner  
**Mailing Address:** Dept of Restorative Dentistry  
                 875 Union Avenue  
                 Memphis, TN 38163

**Phone #:** (901) 448-6052  
**Fax #:** (405) 271-3006  
**E-mail address:** Nedturner@utmem.edu  
**Date:** TBA

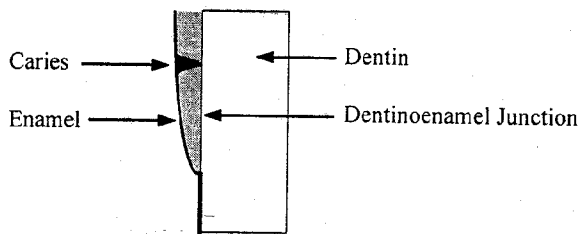
Please return all completed enclosures to Dr. Larry D. Haisch, National Director, UNMC College of Dentistry;  
40<sup>th</sup> and Holdrege Streets; Lincoln, NE 68583-0750. Deadline for return: 30 Days post-meeting  
Office: 402 472-1290     Fax: 402 472-5290     E-mail: LHAISCH@UNMC.edu  
Also send the information on a disk or via e-mail with an attachment,  
indicating the software program and version utilized.

## 2000 NATIONAL CODE AGENDA

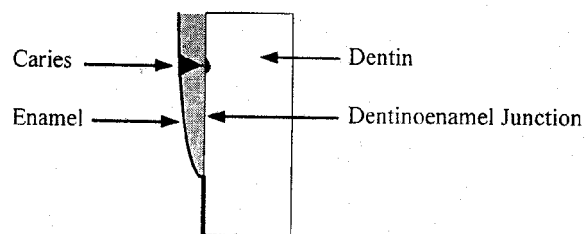
Answers are to be evidence based (please site) where appropriate.



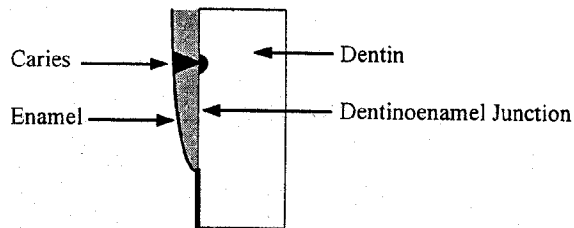
1.



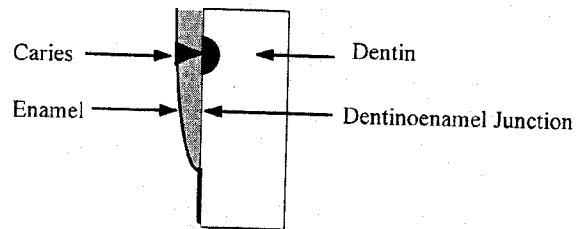
2.



3.



4.



5.

**From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:**

## 2000 NATIONAL CODE AGENDA

Answers are to be evidence based (please cite) where appropriate.

From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:

### 1. Which diagram represents the point at which a preparation/restoration is indicated?

#### **Baylor.** Drawing #3

Benn DK, Clark TD, Dankel II DD, Kostewicz SH. Practical approach to evidence-based management of caries, J Amer Col Dent, Spring 1999; 27-35

#### **Houston.** Diagram 2.

#### **Louisiana.** Figure 2. Carious lesion is more than through the enamel and close to the DEJ.

Pitts, NB Rimmer PA, An in vivo comparison of radiographic and directly assessed clinical caries status of posterior approximal surfaces in primary and permanent teeth., Caries Research. 26(2):146-52, 1992

#### **Mississippi.** Diagram #2

#### **Oklahoma.** #2 - Caries appearing to extend radiographically to the DEJ.

Although there is a portion of the current literature supporting not treating caries until it is into the outer 1/3 of the dentin radiographically, we feel that the caries frequently has penetrated the dentin much further than indicated on the radiograph. Therefore, if the radiograph indicates that the caries is at the DEJ, the caries have probably already penetrated into the dentin. Even though there has been evidence provided that remineralization can occur in non-cavitated lesions up to DEJ and beyond, we feel that the combination of a lack of ability to confirm that true cavitation has occurred clinically, and the difficulty of assuring patient compliance with remineralization and/or home care therapy is reason to restore the lesion at this point.

Anusavice KJ. Treatment regimens in preventive and restorative dentistry. J Am Dent Assoc 1995;126:727-43.

Cites studies indicating that restoration of caries should not occur until caries are well into dentin on the bitewing radiograph due to alternative conservative treatments (Fluoride).

Benn DK. Practical Evidence-Based Management of the Initial Caries Lesion. J dent Educ, 1997; 61(11):853-854.

In a summary of the symposium on management of carious lesion: Discusses the management of the initial caries lesion from a new perspective. One part of which is the monitoring and attempted remineralization of lesions while in enamel or the outer one-third of dentin.

Lunder N, von derFeher FR. Approximal cavitation related to bite wing image and caries activity in adolescents. Caries Res 1996; 30(2):143-7.

Clinical study compared clinically observed cavitation to radiographic lesions in proximal surfaces. The lesions were observed following separation of the teeth, impression of surface, and stone model of surface was poured. In cariously active patients, cavitation was usually found in both lesions to the DEJ and lesions 1 mm into the dentin. In modest caries active patients' cavitations was rarely seen in lesions penetrating only to the DEJ..



Pitts NB, Rimmer PA. An in vivo comparison of radiographic and directly assessed clinical caries status of posterior approximal surfaces in primary and permanent teeth. Cries Res 1992;26: 146-152.

Study compared bitewing interpretation of children in Scotland with clinical findings after tooth separation. Cavitation was observed only 10.5% of the permanent molars observed with radiographic evidence in the inner half of the enamel (including DEJ) were actually clinically cavitated. 41% of the teeth showing radiographic evidence of caries into the outer half of dentin showed signs of actual clinical cavitation.

Thylstrup A Bille J, Qvist BV. Radiographic and observed tissue changes in approximal carious lesions at the time of operative treatment. Caries Res 1986;20(1):75-84.

This study revealed that out of 143 lesions identified as progressing to the DEJ radiographically, 57% were later found during preparation to have caries well into dentin with out cavitation, 31% were later found during preparation to have caries to the DEJ with out cavitation. Out of 330 lesions identified as progressing into outer 1/3 of dentin radiographically, 52% were later found during preparation to have caries well into dentin with cavitation, 48% were later found during preparation to have caries short of or to the dentin with out cavitation.

### San Antonio. Diagram #3

	D2	D3
Thylstrup et al. Car Res 1986;20:75	12%	52%
Mejare & Malmgren.Scand Dent Res 1986;94:19	61%	78%
Pitts & Rimmer. Car Res 1992;26:146	10%	41%
Lunder & von der Fehr. Car Res;1996;30:143	30%	65%

Numerous studies confirm that non-cavitated lesions may be stopped or reversed with preventive and therapeutic (fluoride, antibacterials, xylitol) measures.

**Tennessee.** Diagram 2 generally indicated for restoration in dental school environment.

## 2. Would the number change/remain the same for a patient of low caries risk? What is the evidence?

**Baylor.** Remain the same. Same ref.

**Houston.** The number would change to diagram 3.

Benn DK. Practical evidence-based management of the initial caries lesion. J Dent Ed 61:853-854, 1997.

Anusavice KJ. Efficacy of nonsurgical management of the initial caries lesion. J Dent Ed 61:895-905, 1997.

Mertz-Fairhurst EJ, Curtis JW, Ergle JW, Rueggeberg FA, Adair SM. Ultraconservative and cariostatic sealed restorations: results at year 10.J AM Dent Assoc 129:55-66, 1998.

Sunderholm KJM, Tyas MJ, Jokstad A. Determinants of quality in operative dentistry. Crit Rev Oral Biol Med 9:464-479,1998.

Benn DK, Clark TD, Danke DD II, Kostewicz SH. Practical approach to evidence-based management of caries. J Am College Dentists 66:27-35, 1999.

Frencken JE, Holmgren CJ. How effective is ART in the management of dental caries? Community Dent Oral Epidemiol 27:423-30, 1999.

Weerheijm KL, Groen HJ. The residual caries dilemma. Community Dent Oral Epidemiol 27:436-41, 1999.

Basting RT, Serra MC. Occlusal caries: diagnosis and noninvasive treatments Quintessence Int 30:174-178, 1999.

**Louisiana.** No change. Same ref

**Mississippi.** It would change. This tooth (example 2) would be treatment planned for remineralization and observation.

**Oklahoma.** The number would probably remain the same. However, if the patient has a low caries risk, the tendency might be to observe the lesion to confirm that it is progressing and is an active carious lesion. This would mean possibly allowing the carious lesion to progress to a slightly more advanced stage prior to restorative intervention. During this time an effort would be made to arrest the caries and remineralize the lesion via improved home care, diet modifications and home fluoride treatments.

Anusavice KJ. Treatment regimens in preventive and restorative dentistry. J Am Dent Assoc 1995;126:727-43.

A treatise and review of current research and treatment philosophies concerning preventive and restorative dentistry. The article discusses treatment decisions concerning amalgam restorations relating to caries risk assessment. (64 references)

Anusavice KJ. Efficacy of Nonsurgical management of the initial caries lesion. J Dent Educ 1997; 61(11):895-905.

Suggested in this article that the patients caries risk level must control all treatment decisions. He suggests no operative surgery while caries in within the outer 1/3 of the dentin. Treatment of these types of lesion for the low risk patient should include one or more of the following: no treatment, fluoride varnish three times per year; fluoride gel twice per year; sealant in questionable fissure sights,

Lunder N, von derFeher FR. Approximal cavitation related to bite wing image and caries activity in adolescents. Caries Res 1996; 30(2):143-7.

Clinical study compared clinically observed cavitation to radiographic lesions in proximal surfaces. The lesions were observed following separation of the teeth, impression of surface, and stone model of surface was poured. In cariously active patients, cavitation was usually found in both lesions to the DEJ and lesions 1 mm into the dentin. In modest caries active patients' cavitations was rarely seen in lesions penetrating only to the DEJ..

Pitts NB, Rimmer PA. An in vivo comparison of radiographic and directly assessed clinical caries status of posterior approximal surfaces in primary and permanent teeth. Caries Res 1992;26: 146-152.

This study revealed that out of 143 lesions identified as progressing to the DEJ, 57% were later found during preparation to have caries well into dentin with out cavitation, 31% were later found during preparation to have caries to the DEJ with out cavitation. Out of 330 lesions identified as progressing into outer 1/3 of dentin, 52% were later found during preparation to have caries well into dentin with cavitation, 48% were later found during preparation to have caries short of or to the dentin with out cavitation.

**San Antonio.** At UTHSCSA, the point of preparation/restoration remains #3 (any penetration into dentin) regardless of the patient's caries risk. However, an individualized preventive plan based on the patient's overall caries risk is approved as part of the treatment plan. The following paper indicates that the probability of cavitation is directly related to the caries risk as defined by the number of new lesions over a defined previous time frame.

Lunder N von der Fehr FR. Approximal cavitation related to bite-wing image and caries activity in adolescents. Car Res 1996;30:143-47.

Abstract: 46 lesions classified as either D2 (at DEJ) or D3 (1 mm into dentin). Patients (ages 17-18) classified as CA (caries active) with 6 new lesions over 3 years or MA (little or no caries activity). Confirmation of status was by 24 hour orthodontic separation and low viscosity impression.

Results:

	Intact	Cavity			Intact	Cavity
D2	16	7		CA	2	13
D3	8	15		MA	22	9
Total	24	22		Total	24	22

30 % of the D2 lesions and 65% of the D3 lesions had cavitation

The relative risk for cavitation in CA compared with MA group was 2.99

The relative risk for cavitation in the CA group for lesions at the D3 level compared with D2 lesions in the MA group was 5.4

**Conclusion:** "...for lesions at this level, caries activity must be considered at least as important as the radiological depth of the lesion regarding cavitation."

**Tennessee.** Criteria for low caries risk: Diagram 3

Evidence: Multiple studies including those from NIDR as well as Pitts and Rimmer have indicated a significant number of radiographically diagnosed interproximal lesions failed to demonstrate cavitation on the enamel surface. In low risk patient, remineralization of these lesions should be attempted prior to restoring.

**3. Would the number change/remain the same for a patient of high caries risk? What is the evidence?**

**Baylor.** Would change to drawing #2 Same as above.

**Houston.** The number would stay at 2, depending on dental history and dietary analysis. Refer to cited references in question 2.

**Louisiana.** Higher caries risk would indicate a greater need to restore than a person with a low caries risk assessment.

Foster LV. Three year in vivo investigation to determine the progression of approximal primary carious lesions extending into dentine. British Dental Journal. 185(7):353-7,1998 Oct 10

**Mississippi.** Remain the same.

**Oklahoma.** No, the number should remain the same with an attempt to reduce the caries risk via improved home care, nutritional guidance, fluoride supplements, or possibly chlorhexidine rinses to reduce the Strep Mutans population. Frequent recalls for high risk patients are critical to track these lesions. The use of fluoride varnishes and chlorhexidine rinses/varnishes probably should be incorporated more into the treatment of some high risk patients.

Anusavice KJ. Treatment regimens in preventive and restorative dentistry. J Am Dent Assoc 1995;126:727-43.

A treatise and review of current research and treatment philosophies concerning preventive and restorative dentistry. The article discusses treatment decisions concerning amalgam restorations relating to caries risk assessment. (64 references)

Anusavice KJ. Efficacy of Nonsurgical management of the initial caries lesion. J Dent Educ 1997; 61(11):895-905.

Suggested in this article that the patients caries risk level must control all treatment decisions. He suggests no operative surgery while caries in within the outer 1/3 of the dentin. Treatment should include, at least weekly one-minute rinse of 0.12% chlorhexidine for six weeks, topical fluoride application following each chlorhexidine rinse. Cavity varnish applied when patient is into a moderate caries risk level.

Katz S. The use of fluoride and chlorhexidine for the prevention of radiation caries. J am Dent Assoc. 1982; 104:164-170.

Demonstrated that high weekly doses of chlorhexidine and sodium fluoride remineralized the affected lesions while fluoride treatment alone led to caries progression. The caries arrest and remineralization treatment consisted of four 4-min topical applications of 1.0 percent sodium fluoride and 1.0 percent chlorhexidine solution.

Emilson C G. Potential efficacy of chlorhexidine against mutan streptococci and human dental caries. J Dent Res 1994; 73:682-91.

Concluded that most effective reduction in S mutans has been achieved with chlorhexidine varnishes, followed by gels and oral rinses. He found that treating individuals with the highest counts of S mutans gave the best results. He also found that, at this time, it is impossible to eradicate S. mutans completely from the oral cavity for an extended period of time.

Featherstone JDB. The science and practice of caries prevention. J Amer Dent Ass 2000, 131:887-899.

Presents an overview on the anticaries effects of fluoride and chlorhexidine. Presents suggestion for practical clinical management of caries as a disease.

Beltran-Aguilar ED, Goldstein JW, Lockwood SA. Fluoride varnishes: a review of their clinical use, cariostatic mechanism, efficacy and safety. J Amer Dent Assoc 2000, 131:589-595.

Reviews the success of fluoride varnishes in Europe as a remineralizing and anticaries agent.

Peterson LG, Magnusson K, Anderson H, Almquist B, Twetman S. Effect of quarterly treatments with a chlorhexidine and a fluoride varnish on approximal caries in caries-susceptible teenager: a 3 year clinical study.

Clinical study followed 200 patients for a 3 year period. Study found that treatments every three months with either a fluoride or a chlorhexidine/thymol-containing varnish showed promising effect with low approximal caries incidence and progression in teenagers with proven caries susceptibility.

**San Antonio.** At UTHSCSA the number remains #3 (see above). See attachment for preventive protocols as supervised by the Department of Community Dentistry.

**Tennessee.** Criteria for high caries risk: Diagram 2 for initial caries control. After all restorations placed and any chemotherapeutic agents utilized, would evaluate for strep mutans. If strep mutans counts remained high, would restore potential seeding lesions such as found in diagram 1.

## **What is your school's treatment protocol for patients of:**

### **A. Low Caries Risk**

**Baylor.** With low caries risk patients with lesions representative of drawings #1 and #2, we tend to prescribe fluoride and flossing with reduced intake of refined carbohydrates and no restoration. Each lesion should be re-evaluated for evidence of re-mineralization/arrest and to make sure cavitation is not taking place.

**Houston.**

- review of medical and dental history
- extraoral and intraoral clinical examination
- necessary radiographs
- periodontal evaluation with prophylaxis
- conservative restorative treatment if necessary
- recall schedule formulated

**Louisiana.** All patients are now placed in phase I treatment. Caries and periodontal treatment must be completed before any prosthodontic treatment is evaluated. All patients receive a prophylaxis once a year with no fluoride Tx.

**Mississippi.** See attachment.

**Oklahoma.** Restore if cavitated or radiographic evidence of caries to the DEJ.

For non-cavitated/incipient (Not extending to DEJ) lesions

Proximal surface caries-

No restorative treatment (Observation)

Home care instructions

Fluoride supplements if appropriate

Pit and fissure surface caries-

Sealant or PRR

Home care instructions

Fluoride supplements if appropriate

Pitts NB. Monitoring of caries progression in permanent and primary posteriorapproximal enamel by bitewing radiography. Comm Dent Oral Epidemiol 1983;11:228-35.

Study found that the estimated time of progression of caries through enamel to be three to four years for a low to moderate caries risk individual. This indicates that if the lesion is truly limited to the enamel, it can be observed without fear of rapid progression.

**San Antonio.** See attachment.

**Tennessee.** Minimal restorative treatment, sealants or preventive resins as indicated.

Attempt to remineralize, professionally applied fluoride patient placed in dental hygiene program for prophylaxis and regular recall.

## **B. High caries risk**

**Baylor.** With high caries risk patients with lesion representative of drawing #2 or above, we would restore.

**Houston.**

- review of medical and dental history
- extraoral and intraoral clinical examination
- necessary radiographs
- dietary analysis and consultation
- periodontal evaluation with prophylaxis
- fluoride regimen initiated as necessary
- restorative treatment performed as necessary
- recall schedule formulated

**Louisiana.** If patient appears to be a high risk, they are given caries risk assessment forms to complete. Next year all patients will be given this form to complete. High caries risk patients receive glass ionomer restorations (class 5 and 3) and could also be treated with "open sandwich" restorations. Fluoride trays are made for these patients treated with neutral sodium fluoride. Students are given lectures in the freshman and sophomore years

**Mississippi.** See attachment.

**Oklahoma.** Restore if cavitated or radiographic evidence of caries to the DEJ.  
For non-cavitated/incipient caries -  
Proximal surface caries - no restorative treatment.  
Fluoride supplements  
Home care instructions  
Six month recall  
(Acute cases -0.12% chlorhexidine {Peridex} rinse)  
Pit and fissure surface caries-  
Sealant or PRR  
Home care instructions  
Fluoride supplements  
Dennison JB, Straffon LH, Smith RC. Effectiveness of sealant treatment over five years in an insured population. J Amer Dent Assoc. 2000, 131:597-605.  
Retrospective study of insured population. Findings indicated that a 50% reduction in restorations is achieved over a five year period of time. If sealants are used. It also suggested that sealants are most effective when used on high risk groups.

**San Antonio.** See attachment.

**Tennessee.** Restore all carious lesions. Implement chlorhexidine rinses, fluoride treatment (professional and self applied). Patient re-evaluated at end of caries control and at 3 month intervals.

**4. Indicate which drawing is minimally acceptable as a board lesion for the dental licensure board at your school/in your region. As several different board examinations may be given, please indicate the drawing and the respective examination.**

**Baylor.** Western Regional Examining Board (WREB): Drawing 2 (perhaps even half way through the enamel; this would be between drawings 1 and 2). This is anecdotally based, not evidence based.

We treat patients and educate students based on two criteria:

Anecdotally: with clinical progress examinations we use WREB guidelines for lesion classification

Evidence based: with lecture and every day clinic procedures we use the criteria mentioned in 3a and 3b above.

**Houston.** Diagram 2.

**Louisiana.** Figure 2.

**Mississippi.** Drawing #2. Mississippi State Board of Dental Examiners

**Oklahoma.** Drawing #2 would fit the Western Regional board Examination minimally acceptable for an acceptable carious lesion for restoration.

**San Antonio.** Although the WREB has stated that penetration must be to dentin, in the past, examiners have approved lesions that are midway between diagrams #1 and #2.

**Tennessee.** Minimally acceptable lesion for SRTA is diagram 2.

**5. Previous CODE agendas have dealt with caries risk assessment. In addition much is heard about remineralization, minimum intervention, and the use of sealants.**

**How is all of this really affecting:**

**A. Decisions to treat**

**Baylor.** See 3a and 3b above

Anecdotal: Lesions that are half the distance to the DEJ are treated regardless of contributory or non-contributory factors.

Evidence based: Caries rate, age, and historical progression of the lesion are considered.

**Houston.** Treatment of low risk patients has become more conservative.

**Louisiana.** Usually non-cavitated lesions are left alone and not treated unless radiograph shows lesion just to or deeper than DEJ.

**Mississippi.** Probably more decisions are made to watch incipient lesions with possible remineralization with Prevident and oral hygiene reinforcement.

**Oklahoma.** We have seen a significant change in the number of lesions treatment planned for traditional types of restorative work. The incipient pit and fissure lesions are frequently being treated with fissurotomy and sealants and/or preventive resin restorations.

**San Antonio.** The decision to treat has been greatly affected by the Caries Risk Assessment program at UTHSCSA. Many fewer restorations are planned in low risk patients than were previously planned. The faculty of our Dental Diagnostic Sciences Department, as well as the faculties of the Departments of Restorative Dentistry and Community Dentistry are pretty well in tune with this concept.

**Tennessee.** Sealants and preventive resins used whenever possible. However, due to limited patient base, often provide restorative treatment in cases that may be observed in private practice environment.

**B. Preparation designs**

**Baylor.** Evidence based: On the occlusal surface we restore caries that is into the dentin and seal grooves and pits rather than use the G. V. Black principle of extension for prevention for the preparation/restoration. However, there is a modicum of disagreement regarding slot preparations in spite of research evidence of effectiveness. Some of our faculty members are not convinced that slot preparations are valid for adequate treatment. We do not teach tunnel preparations.

Fuks AB, Shey Z. In vitro assessment of marginal leakage of combined amalgam-sealant restorations on occlusal surfaces of permanent posterior teeth. J. Dent. Children. 1983; Nov.-Dec, 1983; 425-29.

**Houston.** Preparation designs have become more conservative to conserve healthy tooth structure.

**Louisiana.** No change. We prepare only effected areas, keeping preparation as minimally a possible.

**Mississippi.** Preparation designs have not changed much, may be slightly more conservative.

**Oklahoma.** Our class II preparations have changed very little. We allow a more rounded internal form in preparations for composite resin restorations. We still try to stick to a conservative G V Black preparation. We utilize slot preparations in some isolated situations. Class I preparations are frequently more conservative due to increased use of sealants and preventive resin restorations.

**San Antonio.** Preparation design had been changed to 'minimal intervention' even prior to the development of the strong program for caries risk assessment. Preparation design has not been affected by caries risk.

**Tennessee.** Kept as conservative as possible in all cases. More commonly using combination of materials including resins or amalgams in carious lesions combined with sealants over remaining pits and fissures.

### **C. Choice of restorative materials**

**Baylor.** We use amalgam and composite resin. There are some opinions that a flowable composite should be used at the gingival margin of a Class II composite restoration. Those who believe this say it is evidence based but no evidence was found.

**Houston.** Increased use of adhesive techniques and materials which lend themselves to more conservative treatment options and cavity preparation designs.

**Louisiana.** No affect. We are not relying much on remineralization

**Mississippi.** More use of sealants and preventive resin restorations.

**Oklahoma.** Class II restored with Dispersalloy most of the time. Conservative preparations may be restored with hybrid resin composite (TPH, Herculite).  
Class I restored with Dispersalloy, TPH, Herculite, or Ultraseal XT sealant.  
Class III & V restored with TPH, Herculite, or Silux plus.  
Class V restored with TPH or Herculite usually. Sometimes dispersalloy or Fuji II LC

**San Antonio.** Caries risk affects the choice of materials for Class 5 restorations (resin-modified glass ionomer used in high or very high risk patients). For other situations, caries risk has had little effect on the choice of restorative materials, except that in high and



very high risk patients, the general guideline is that the more expensive (indirect) restorations not be done until the caries risk status is lowered.

**Tennessee.** Sealants, preventive resins and some conservative posterior composite resins in low caries risk patients. When necessary or appropriate, amalgam and glass ionomer restoratives may be placed.

## **6. What is the evidence for use of compomers?**

**Baylor.** We don't know what evidence is available, however, we've found (anecdotal evidence) that compomer restorations generally must be replaced approximately every 18 months when placed in areas of occlusal stress.

**Houston.** Roeters JJ, Frankenmolen F, Burgersdijk RC, Peters TC. Clinical evaluation of Dyract in primary molars: 3-year results. *Am J Dent* 11:143-148, 1998. van Dijken JW. Longevity of new hybrid restorative materials in class III cavities. *European J Oral Sci* 107:215-219, 1999.

Dietrich Th, Lsche AC, Lsche GM, Roulet J-F. Marginal adaptation of direct composite and sandwich restorations in Class II cavities with cervical margins in dentine. *J Dent* 27:119-128, 1999.

Welbury RR, Shaw AJ, Murray JJ, Gordon PH, McCabe JF. Clinical evaluation of paired compomer and glass ionomer restorations in primary molars: final results after 42 months. *British Dent J* 189:93-97, 2000.

Tate WH, You C, Powers JM. Bond strength of compomers to dentin using acidic primers. *Am J Dent* 12:235-242, 1999.

Tate WH, You C, Powers JM. Bond strength of compomers to human enamel. *Oper Dent* 25:283-291, 2000.

**Louisiana.** None

**Mississippi.** See attachment.

**Oklahoma.** We do not use compomers in our adult clinic at this time.

**San Antonio.** There is evidence that the fluoride released by compomers is much better than in the original materials, but the level of fluoride release is between that of resin-modified glass ionomers and resin composites. Although the handling characteristics of the compomers are good, we still have not seen reason to add them to the materials used by students.

**Tennessee.** Evidence for compomers: No evidence currently exists that indicates compomers are a superior product over glass ionomer restorations.

## **B. How are they being used in clinics?**

**Baylor.** We seldom use them in the clinic with the possible exception of an occasional restoration of a Class V abrasion or abfraction. Apparently fluoride is released in very small quantities because it becomes locked in the resin. (This is hotly contested in current literature. The amount and duration of fluoride release from any glass ionomer is suspect at this point.)

**Houston.** Occasionally, they used in low stress bearing areas in adult and primary teeth and as a cavity liner (flowable formulations).

**Louisiana.** We don't use any

**Mississippi.** They are available as a faculty request item only, particularly for some Class V situations. Several part-time faculty in full-time practice like to use Dyract AP for these areas. Compomers are not used routinely in the clinics.

**Oklahoma.** These are used mainly by our Pedodontic department for primary teeth.  
-There seems to be some question as to how effective the release and "recharge" of fluoride is in compomers when in the oral environment and if the amount of fluoride released is effective.

Attin T, Buchalla W, Siewart D, Hellwig E. Fluoride release/uptake of polyacid-modified resin composites (compomers) in neutral and acidic buffer solutions. J of Oral Rehab 1999, 26(5):388-93.

This in-vitro study concluded that Dyract and Compoglass can not be replenished with fluoride irrespective of the pH value of the environment. The fluoride released from these materials decrease dramatically in the initial 4-6 days following placement.

Itota T, Okamoto M, Sato K, Hakabo S, Nagimine M, Torii Y, Inoue K. Release and recharge of fluoride by restorative materials. Dental Materials Journal 1999, 18(4):347-53.

This study suggested that poly-modified resin composites (Compomers) could slightly recharge with fluoride (less than 1.5ppm) in perfect conditions. It found that they could not recharge with fluoride in an acid environment. Resin-modified glass ionomers could be recharged with a higher concentration of fluoride, but also lost the ability to recharge with fluoride in an acid environment.

The physical properties of compomers are much weaker than can be attained by using a resin composite.

El-Kalla IH, Garcia-Godoy F. Mechanical properties of compomer restorative materials. Operative Dentistry 1999, 14(1):2-8.

This in-vitro study showed that compomers (Compoglass, Dyract, Hytac) had compressive strengths and flexural strengths that were less than a resin composite (Z100). The compomers were found to be stronger than a resin-modified glass ionomer (vitremer).

El-Kalla IH, Garcia Godoy F. Bond Strength and interfacial micromorphology of compomers in primary and permanent teeth. Int J Paediatric Dent 1998, 8(2):103-14.

In-vitro study compared the bond strength of compomers, resin-modified glass ionomer, and resin composites.

Their conclusions were that compomers tested had shear bond strength values between those of resin-modified glass ionomers and resin composites.

Peutzfeldt A, Garcia-Godoy F, Amussen E. Surface hardness and wear of glass ionomers and compomers. Amer J Dent 1997, 10(1):15-17.

Study of Rockwell hardness and in-vitro three body wear tests on glass ionomers, resin composite, and compomers. The study found that compomers showed more wear than a conventional glass ionomer or a resin composite. It also found that compomers had a lower surface hardness than resin composites.

The esthetic properties are not as good as can be attained by using a resin composite.

Gladys SM, Van Meerbeek B, Lambrechts P, Vanherle G. Evaluation of esthetic parameters of resin-modified glass-ionomer materials and polyacid-modified resin composite in Class V cervical lesions. Quintessence International 1999, 30(9):607-14.

Clinical study observed and compared the esthetics of Class V restorations, restored with traditional glass ionomer, resin modified glass ionomers, and polyacid resin composite (Compomer). The study evaluated restorations' color stability, translucency and roughness. It was concluded that the esthetics for all of the materials were far from optimal and could not compete with the esthetics offered by a resin composite restoration.

**San Antonio.** They are not.

**Tennessee.** Compomers are used on an extremely limited basis, primarily for some more advanced seniors to give them experience in alternative materials that are currently available on the market.

## **7. What is the evidence for use of flowable composites?**

**Baylor.** Don't know for sure.

**Houston.** Bayne CB, Thompson JY, Swift EJ, Stamatiades P, Wilkerson M. A characterization of first-generation flowable composites. JADA 129:567-577, 1998.

Ferdianakis K. Microleakage reduction from newer esthetic restorative materials in permanent molars. J Clin Pediatr Dent 23:221-229, 1998

Payne JH IV. The marginal seal of class II restorations: flowable composite resin compared to injectable glass ionomer. J Clin Pediatr Dent 23:123-130, 1999.

Unterbrink GL, Liebenberg WH. Flowable resin composites as ôfilled adhesivesö: literature review and clinical recommendations. Quintessence Int 30:249-257, 1999.

Tung FF, Estafan D, Scherer W. Microleakage of a condensable resin composite: An in vitro investigation. Quintessence Int 31:430-434, 2000.

**Louisiana.** None that we are aware of.

**Mississippi.** See attachment

**Oklahoma.** We essentially use a flowable composite (Ultraseal XT) for our sealant. We do not at this time routinely use a flowable composite to line posterior composite preparations.

Bayne SC, Thompson JY, Seift EJ Jr, Stamatiades P, Wilkerson M. A characterization of first-generation flowable composites. J Am Dent Assoc 1998, 129(5):567-77.

In-vitro mechanical properties comparison study. Based on the properties of the compomer materials evaluated, they recommended that clinicians should be cautious and limit use of compomers to applications that benefit from better flow and are not associated with high stress. The clinical performance of flowable composites in terms of wear resistance have yet to be demonstrated.

Labella R, Lambrechts P, Van Meerbeek B, Vanherle G. Polymerization shrinkage and elasticity of flowable composites and filled adhesives. Dental Materials 1999, 15(2):128-37.

In-vitro study looked at the elastic modulus, polymerization shrinkage, and shrinkage kinetics of flowable composites. Their conclusions stated that flowables shrink more and are less rigid. Their effect on interfacial stress build-up cannot be easily predicted.

**San Antonio.** There is evidence to support the use of flowable composites as sealants. The evidence for other uses is weak.

**Tennessee.** Evidence for flowable composites: none. No long term clinical studies or lab studies have demonstrated superior performance over conventional composite resin restorative materials.

## **B. How are they being used in clinics?**

**Baylor.** Occasionally used for preventive resin restorations (PRR) at the discretion of the instructor. Tetric Flow is available in our dispensary. However, although it is not considered a flowable composite, we usually use Ultraseal XT sealant that is approximately a 50% filled resin.

**Houston.** Flowable composites are being used for sealants, preventive resin restorations, occasionally as restorations in a low stress areas, and in some situations, are used as cavity liners in proximal preparations prior to final restoration with a higher filled posterior composite.

**Louisiana.** We don't use any

**Mississippi.** We do not use flowable composites in the clinic at this time, however, preventive resin restorations are done with a posterior composite or filled sealant.

**Oklahoma.** A flowable resin composite sealant (Ultraseal XT = 60% filled) is mainly used as a sealant in our clinic. Infrequently used as liner beneath a posterior resin composite.

**San Antonio.** As fissure sealant.

**Tennessee.** Very limited use, in some cases as preventive resins or as a liner in a posterior composite resin. A clinical study of flowable composites in non carious Class V lesions is currently in progress.

## **8. What teaching guidelines and materials are used for build-ups?**

**Baylor.** Usually we use either amalgam or Ti-Core as build-up materials. Build-ups are required when inadequate tooth structure is available for restoration (crown or onlay) and we require that margins be on tooth structure unless clinically impossible. On rare occasions, we use pins (Max Pins) for extra retention. In any case (with or without pins) we bond the build-up material for retention. We have found that Ti-Core must be bonded in a manner similar to bonded amalgam or it has a tendency to fail.

**Houston.** Build-ups are used for any tooth with primary or secondary caries and/or a tooth with a defective restoration that has been assessed and treatment planned to receive a restoration providing cuspal coverage (full or partial tooth coverage).

Amalgam is used as well as composite core build-up materials.

**Louisiana.** Fixed is requiring all buildups on bicuspids to be completed with composite resin. They will allow amalgam in molars but prefer composite resins.

**Mississippi.** Large buildups: 1) pin or slot/box retained amalgam. 2) bonded composite core (Fluorocore, TiCore);

Small buildups: 1) to fill in undercuts or to replace missing portions of cavity walls: 2) a. Ketac Silver b. Fuji IX G.I.

**Oklahoma.** We utilize bonded amalgam to restore core build-ups when ever possible. We do not rely on the bonding process to provide retention for the restoration. In cases where retentive features such as boxes, grooves or dovetails will not provide adequate retention, pin retention is used to replace the junction of any two missing vertical walls of the prep. Cores for anterior teeth with some supporting tooth structure remaining are restored with pins or post along with resin composite. Badly broken down anterior teeth are usually built up with a cast post and core. Small cores or undercuts may be built up with a resin composite material or a resin modified glass ionomer.

Hornati AA, Denehy GE. Retention of cast crowns cemented to amalgam and composite resin cores. J Prost Dent 1981 45(5):525-528.

In-vitro study to determine tensile bond strength of complete cast gold restorations cemented on resin composite crown cores and amalgam crown cores. Results showed that the amalgam cores provide more retention for the cast gold crown than does the composite resin core.

Gateau P, Sabek M, Dailey B. Fatigue testing and microscopic evaluation of post and core restorations under artificial crowns. Journ Prost Dent 1999 82(3):341-7.

In vitro study compared the ability to resist forces of cyclic loading (400N for 1.5 million cycles). The cores fabricated with amalgam had the lowest number of defects. Glass ionomer showed the highest number of defects. The composite cores were found to be superior to the glass ionomer cores.

Reagan SE, Fruits TJ, Van Brunt CL, Ward CK. Effects of cyclic loading on selected post-and core-systems. Quint Internat 1999 30(1):61-67.

In-vitro study evaluating the resistance to cyclic fatigue of prefabricated posts with amalgam cores, prefabricated posts with resin composite cores, and cast post and cores. The study found no significant difference between the post-and-core systems in regard to failure due to cyclic fatigue testing.

CohenBI, Pagnillo MK, Newman I, Musikant BL, Deutsch AS. Cyclic fatigue testing of five endodontic post designs supported by four core materials. Jour Prost Dent 1997 78(5):458-464.

In vitro study examined cyclic fatigue of four core materials: Amalgam, resin composite, glass ionomer, and silver reinforced glass ionomer. The composite and amalgam materials did not fail after 4 million fatigue cycles, both of the glass ionomer materials failed prior to 4 million fatigue cycle.

**San Antonio.** - For posterior teeth, amalgam is used almost exclusively.

- Each amalgam build-up involves both mechanical resistance/retention features and bonding with Amalgambond Plus with HPA powder.

- Posts are used only when needed for retention of the amalgam.

- All non-centric contacts on tooth/restoration removed to reduce chances of fracture prior to coronal coverage with casting.

**Tennessee.** Materials: amalgam, composite resin with contrasting color (i.e. blue core) if a sufficient number of walls and adequate pulp chamber is available in posterior teeth.. Build-ups are performed subsequent to endodontic procedure or teeth with extensive breakdown and to rebuild ideal form.

Techniques vary from chamber retained amalgam or composite or the use of a prefabricated or custom post and core depending on location, the amount of remaining tooth structure, etc.

## **9. What is the evidence for routine use of cavity sealants with amalgam restorations?**

**Baylor.** Fluid flow to and from the pulp can allow bacterial and bacterial toxin ingress to the pulp that may cause sensitivity and pulpitis (sometimes reversible and sometimes not reversible). We recommend that either copal varnish be used as a sealant or that the dentinal surface be sealed with primer and bonding agent. In the fourth year (General Dentistry Department) uses no sealant. The amalgam is placed directly on the dentin; the rationale is that high copper amalgam does not seal (corrode) quickly enough so it is best to place the restorative material as close to tooth structure as possible and seal margins in that manner.

**Houston.** Sturdevant CM. The Art and Science of Operative Dentistry. St. Louis: Mosby-Year Book, 1995; 246-249.

Schwartz RS, Summitt JB, Robbins JW. Fundamentals of Operative Dentistry A Contemporary Approach. Chicago: Quintessence, 1996; 174, 281.

Hilton TJ. Cavity sealers, liners, and bases: Current philosophies and indications for use. Oper Dent 21:134-146, 1996.

Al-Jazairy YH, Louka AN. Effect of bonded amalgam restorations on microleakage. Oper Dent 24:203-209, 1999.

Setcos JC, Staninec M, Wilson NH. A two-year randomized, controlled clinical evaluation of bonded amalgam restorations. J Adhesive Dent 1:323-331, 1999.

Browning WD, Johnson WW, Gregory PN. Clinical performance of bonded amalgam restorations at 42 months. JADA 131:607-611, 2000.

**Louisiana.** Not aware of any. We went through a phase of bonding under amalgam when we stopped using copalite. Old habits required a lining. We have found no evidence comparing any liner to no liners. We don't use any liners or sealants under amalgam.

**Mississippi.** Ultraconservative and cariostatic sealed restorations: Results at Year 10. Eva Mertz-Fairhurst et. al JADA Vol 129 Jan 1998

**Oklahoma.** There have been mixed results reported from studies concerning the use of dentin bonding agents as sealants under amalgam restorations. The main benefit seems to be a reduction in microleakage compared to the use of Copalite or the use of no sealant at all. The majority of the evidence concerning the effects the use of DBA's on microleakage is based on in vitro studies Results are mixed as to whether DBA's used as sealants are more effective at reducing post-operative sensitivity.

Meiers JC, Turner EW. Microleakage of dentin/amalgam alloy bonding agents: results after 1 year. Operative Dentistry 1998, 23(1):30-5.

In vitro study utilizing human teeth. Evaluated microleakage after one year in teeth lined with a Dentin bonding agent, Copalite, or no liner. Results indicated that the majority of the dentin bonding agents allowed significantly less microleakage than copalite or no liner after one year.

Berry FA, Parker SD, Rice D, Munoz Ca. Microleakage of amalgam restorations using dentin bonding system primers. Amer J Dent 1996, 9(4):174-8.

- In vitro study on human teeth evaluating and comparing microleakage of etched and non-etched amalgam restorations lined with dentin bonding agents, copalite or no liner. The results indicated that the unlined and Copalite lined groups and all non-etched groups showed considerably more marginal leakage than those lined with the dentin bonding agents.
- Chang JC, Chan JT, Chheda HN, Iglesia A. Microleakage of a 4-methacryloxyethyl trimellitate anhydride bonding agent with amalgams. *J Prost Dent* 1996, 75(5):495-8.
- In vitro study of microleakage following thermocycling. Compared the use of Amalgambond, Copalite, and no liner beneath amalgam. Results suggested that the use of Amalgambond greatly reduced the amount of microleakage around all of the amalgams and dentin surfaces compared to Copalite or the use of no liner.
- Turner EW, St Germain HA, Meiers JC. Microleakage of dentin-amalgam bonding agents. *Amer J Dent* 1995, 8(4):191-6.
- In vitro study using human teeth evaluated microleakage of dentin bonding agents compared to Copalite or no liner beneath CI V amalgam restorations. The results suggested that a significant reduction in microleakage at the enamel and dentin margins was found in all dentin bond system liner groups when compare to unlined and Copalite lined alloys.
- Korale ME, Meiers JC. Microleakage of dentin bonding systems used with spherical and admixed amalgams. *Amer J Dent* 1996, 9(6):249-52.
- In vitro study of human teeth comparing the microleakage observed following thermocycling with the use of various cavity liners. The Class V preparations were restored with amalgam and compared the use of dentin bonding agents, Copalite and no liner. The results indicated that the restorations lined with dentin bonding agents exhibited significantly less microleakage than those lined with Copalite or no liner.
- Ben-Amar A, Liberman R, Rothkoff Z, Cardash HS. Long term sealing properties of Amalgambond under amalgam restorations. *Amer J Dent* 1994, 7(3):141-3.
- In vitro study using human teeth evaluated microleakage of amalgambond compared to Copalite or no liner beneath CI V amalgam restorations. The results indicated that amalgambond showed significantly less microleakage as compared to unlined restorations or Copalite-lined restorations.
- Browning WD, Johnson WW, Gregory PN. Postoperative pain following bonded amalgam restorations. *Oper Dent* 1997, 22(2):66-71.
- Double blind clinical trial utilized a post operative survey to assess the effect of using a dentin bonding agent on the amount of post operative sensitivity experienced by the patient. The teeth were lined with either copal varnish or dentin bonding agent. The results indicate that the group receiving the dentin bonding agent as a liner was not found to be any less sensitive to cold.
- Browning WD, Johnson WW, Gregory PN. Reduction of postoperative pain: a double blind, randomized clinical trial. *J Amer Dent Assoc* 1997, 128(12):1661-7.
- Double blind randomized study compared post-op sensitivity in teeth restored with amalgam and lined with either a Copalite/Glass ionomer combination liner or a dentin bonding. The study found that the adhesive liner was more effective at controlling postoperative sensitivity than the combination of Copalite varnish and glass ionomer liner.
- Browning WD, Johnson WW, Gregory PN. Clinical performance of bonded amalgam restorations at 42 months. *J Amer Dent Assoc*. 2000, 131:607-611.
- Clinical study which evaluated amalgams placed with dentin bonding agents used as liners. After 42 months the results indicated that in regard to anatomical form, marginal adaptation, retention, and secondary caries, these restorations were found to be in good condition compared to traditional methods.
- Mahler DB, Engle JH. Clinical evaluation of amalgam bonding in Class I and II restorations. *J Amer Dent Assoc*. 2000, 131:43-49.
- Clinical study which followed restorations placed using Panavia, cavity varnish, or no liner beneath the amalgam restoration. Results found no difference in the postoperative sensitivity after three years of observation.
- Davis R, Overton JD. Efficacy of bonded and nonbonded amalgam in the treatment of teeth with incomplete fractures. *J Amer Dent Assoc* 2000, 131:469-478.
- Clinical study comparing relief of chewing pain and cold sensitivity in teeth restored with bonded amalgam versus teeth restored with mechanical pin retention. The results suggest that both methods are effective in relieving symptoms in incomplete fractures of teeth. The authors suggest that the adhesive bonding is more conservative but the longevity of its success is not known.

**San Antonio.** There is little clinical evidence for routine use of either cavity varnishes or resin adhesives.

**Tennessee.** Evidence for sealants with amalgam: Studies by Summitt and others have suggested that such restorations provide sufficient longevity and clinical performance while preserving tooth structure.

## **B. What is the clinical usage?**

**Baylor.** See 9a.

**Houston.** We routinely use an adhesive system with amalgam restorations.

**Louisiana.** We don't use sealants with amalgam. Occasionally we utilize the bonded amalgam technique. This is to increase retention in some compromised teeth not for sealing purposes.

**Mississippi.** We do not routinely seal our amalgams, however, we do finish and polish the final amalgam restoration for quality assurance, margination, less plaque retention.

**Oklahoma.** Dentin bonding agents are used beneath all amalgam restorations in our clinics

**San Antonio.** At UTHSCSA, cavity sealers are not routinely used.

**Tennessee.** No response

**Schools are utilizing various levels of simulation in pre-clinical labs. (Heads, torso, computer, Dent Sim, etc., in comparison to "the pole and dentoform.")**

## **10. Do the sophisticated systems make a difference in the clinical performance?**

**Baylor.** We are still using "the pole and dentoform" so that we cannot answer the rest of the questions in this category including number 11. At this time, however, we have one ADEC torso simulator and are now in the process of evaluating it.

**Houston.** We do not have any first hand experience in which to base an opinion.

**Louisiana.** NO. We think since it seems to more closely duplicate the clinic environment the student will more quickly become comfortable in this new setting.

**Mississippi.** In theory various simulation systems sound promising. We are currently using the pole and dentoform in pre-clinic. We have two DentSim units and plan to incorporate their use in our D-1 spring restorative course.

**Oklahoma.** There does not seem to be much evidence at this time that sophisticated systems make a difference in the clinical performance of students.



Green TG, Klausner LH. Clinic simulation and preclinical performance. J Dent Educ 1984, 48(12):665-668. This study involved a comparison of two groups of students in a preclinical operative dentistry course. One group worked in an actual clinical setting on typodonts and the other worked in a preclinical lab setting with typodonts on a bench-rod. The students doing preclinical work in the clinic did not perform significantly better on practical examinations than students working in a typical laboratory environment.

Suvinen TI, Messer LB, Franco E. Clinical simulation in teaching preclinical dentistry. Eur J Dent Educ 1998, 2(1):23-32.

In this manuscript, simulation equipment used for 2nd, 3rd, and 4th year dental students is described at the U. of Melbourne. Student reaction to working with the simulator was uniformly positive. Students preferred it to traditional preclinical laboratory instruction.

**San Antonio.** Don't know. We are planning to go to a more sophisticated system, but, as of now, we are still using a typodont on a pole. We are using teeth with simulated pathosis, and, although we do not have evidence of improved teaching with these, our sense is that it does facilitate learning.

**Tennessee.** Unknown. No school has reported the incorporation of the DENTSIM units as a matter of routine in their curriculum. Dr. J. Buchanan at Penn has done extensive work in the evaluation for the potential addition to the curriculum. It is anticipated that in the summer 2001, DENTSIM will be introduced at the University of Tennessee as part of the regular pre-clinical curriculum with potential future use in areas such as competencies, remediation and for board preparation.

#### **A. To what degree, and what is the evidence?**

**Baylor.** See part a.

**Louisiana.** Not aware of any. Outside of dentistry simulations do help pilots, etc.

**Houston.** Substantive long-term data assessing these sophisticated systems is needed.

**Mississippi.** No response

**Oklahoma.** Can not find much evidence one way or the other. We still have a pole and dentoform in our preclinical lab.

**San Antonio.** No answer for this

**Tennessee.** See part a.

#### **B. Report on any controlled studies underway**

**Baylor.** See part a.

**Louisiana.** None at our school

**Houston.** No response

**Mississippi.** University of Pennsylvania is currently looking at the DentSim use in their pre-clinical curriculum.

**Oklahoma.** None

**San Antonio.** No response.

**Tennessee.** See part a.

**11. Do the sophisticated systems decrease the amount of time necessary for students to make the transition from pre-clinic lab to clinic?**

**Baylor.** See #10.

**Houston.** We do not have any first hand experience in which to base an opinion.

**Louisiana.** No.

**Mississippi.** We are not currently using any sophisticated systems. Plans are to incorporate the DentSim into pre-clinical teaching and follow progress of students. Future plans also include listing of course syllabi, class notes, and other class assignments on Departmental web pages to allow students easier access.

**Oklahoma.** No evidence at this time.

**San Antonio.** Don't know, but it would appear that they would make the transition easier.

**Tennessee.** Unknown. Dr. Buchanan's studies are currently being performed with pre-clinical students and no results have been reported concerning clinical transition or performance as a result of implementing such technology.

**By what amount, and what is the evidence?**

**Baylor.** See #10.

**Louisiana.** Not applicable

**Houston.** Substantive long-term data assessing these sophisticated systems is needed.

**Mississippi.** No response

**Oklahoma.** Don't have any idea.

**San Antonio.** No answer for this question

**Tennessee.** See part a.

## **Report on any controlled studies underway**

**Baylor.** See #10.

**Louisiana.** Not applicable

**Houston.** No response

**Mississippi.** University of British Columbia new dental curriculum. University of Pennsylvania use of DentSim units.

**Oklahoma.** None

**San Antonio.** No response

**Tennessee.** No response

**12. What is your school's current utilization level of technology? What is being used and how? (Interactive videos, course web sites, paperless, etc.) Is learning being improved and what is the evidence?**

**Baylor.** We are initiating course websites. Equipment has just arrived which will allow us to create interactive videos. We have the MicroMedix program on line that provides dosing tools, drug interaction, calculator and generates take-home notes for patients. We have a computer available in the clinic for student use during patient care.

**Houston.** Limited use of on-line course adjunct via Blackboard.com.  
Digital lecture presentations via PowerPoint for Operative preclinical courses is utilized.

- The digital technology used for lecture presentations allows for the presentation of more up-to-date course material and images (of dental concepts and ideas, preparations/restorations, restorative materials), provides physically clearer images and text when compared to traditional slides, and provides an information medium in which today's students are comfortable.

Substantive long-term data assessing newer technology is needed.

**Louisiana.** Computer generated slide presentations. These presentations are then made available on our network system for the students to review. We also have a Gobal microscope with a built in TV camera. We can record on a VCR and print still digital photos from the scope. We have recently acquired new digital cameras. A "head-cam" to record videos of actually work on patients.

**Mississippi.** Our level of technology is at the infancy stage. The administration is beginning work on placing course syllabi on a web site. Clinically, all our restorative daily grades are entered in the computer which can be accessed by appropriate faculty. Also at the discretion of the faculty, previous kodachrome slide presentations may be scanned onto a CD for LCD

projection. Also all faculty have computers which are part of a network for centralized scheduling and electronic mail. Students seem to appreciate lecture outlines printed from powerpoint presentations. We can't say if learning is being improved.

**Oklahoma.** Our students have access to some of their course work on the college's intranet. These provide instructional information, slide presentations. We have recently installed new software which allows better tracking of patient care and allows students to scheduling patients into the clinic over the internet. There are some interactive learning web pages to allow the students to respond to practice exam questions.

**San Antonio.** We have supplied the freshman students, entering in July 2000, with laptop computers, and all textbooks and course manuals/synopses are supplied to them on a DVD that is replaced with a new DVD at least every semester. The DVD has all the textbooks that they will use throughout the 4-year curriculum on it. As the course manuals/synopses are digitized, they too will be on the DVD for the 4 years, so when the student leaves, he/she will have a DVD containing all textbooks and course manuals/synopses used in the curriculum. The DVD will also be able to hold lectures, demonstrations, 3-D images, etc. as they are developed.

**Tennessee.** Tennessee is in the process of renovating all pre-clinical laboratories and determining the level of technology we will incorporate. Most courses are currently being placed on web sites. No interactive videos are currently in use.

**What clinical studies with direct or indirect restorative implications are being conducted at your school? Give a brief description.**

**Baylor.** None that we know about.

**Houston.** Two clinical trials: Both evaluating direct posterior composites. One involving Alert , the other Tetric HB. Ryge criteria is used to evaluate restorations at years 1 and 2.

**Louisiana.** We are into our 3rd year evaluating Class V restorations using a self-etching primer. We are into a 2nd year evaluating Class V with several different composite resins. We are evaluating injection techniques with the Wand. We should be shortly starting a new study with class 2 resins.

**Mississippi.** At this time we are not conducting any clinical studies with restorative materials. However, we have completed a laboratory microleakage study and shear bond strength study comparing some of the new self-etching adhesives.

**Oklahoma.** None

**San Antonio.** Amalgam bonding study - This study now has five-year data collected and reported. An abstract is attached.

Class 2 resin composite study - Although this study now has five-year results that will be reported at the March 2001 meeting of the IADR, the abstract of the four-year results is attached.

Ceramic onlay study - The abstract of the 4-year results is attached.

**Tennessee.** Clinical studies with direct or indirect restorative implications:

2 year clinical study of flowable composite resin restoratives in non-carious Class V lesions. A minimum of 60 lesions are in the process of being restored, 30 with flowable composite and 30 with conventional composite resins.

#### **CODE Question:**

For the future, CODE would like to consider a “paperless” directory. The directory would be accessible on our web site.

**Do you support an electronic directory?** Yes \_\_\_X\_\_\_ No \_\_\_\_\_

Comments:

**Baylor.** Yes, we support an electronic directory. An electronic directory takes up no physical space and little computer space. It would be very convenient.

**Houston.** No response

**Louisiana.** This allows ability to communicate from anywhere, home, work or away at meeting without having to carry address books, etc. Most people have access. If they don't they should.

**Mississippi.** Only if there are proper security measures taken to insure that this directory doesn't get picked up by unauthorized organizations or individuals.

**Oklahoma.** No response

**San Antonio.** However, we would print it out in order to have a hard copy.

**Tennessee.** Yes, Tennessee would support an electronic directory.

#### **Regional Agenda Items**

##### **CODE Region III - Regional Agenda**

#### **Educational philosophies:**

##### **Student evaluation**

1. How do you design pre-clinical grading systems (daily and practical grading criteria) that will identify the weak student without demoralizing the average student who may just be having a bad day? How do you grade fair, but penalize weaker, poor, and/or unacceptable work (enough for dismissal documentation if necessary)?

**Baylor.** The detailed grading criteria helps to accomplish fair grading by pinpointing shortcomings. Therefore the weaker students are automatically penalized for poorer work. The grading system provides a continuing documentation available to both students and faculty. There are times when the weaker students are required to repeat the course or the entire year.

**Houston.** We use daily grading cards, which constitutes 20% of the student's final grade. Remakes of failed projects are graded as pass or fail; the first grade assigned for practical examinations is the grade of record.

**Louisiana.** There's no special considerations. We try to have enough procedures so one or two bad days will not significantly hurt someone. Our failing grade, numerically is not so low as to keep someone from failing the course unless he has several bad days. There is no special consideration when a poor student has a good day!

**Mississippi.** See attachment

**Oklahoma.** The daily projects in our first year preclinical course are not given a grade. They are critiqued and evaluated but the student receives full credit for the project if it is completed on time regardless of the evaluation. No project is deemed complete unless reaching a level of clinical acceptance. This allows the students to practice and be evaluated without the pressure of worrying about the evaluation affecting their grade. The weak student is usually identified by the fact that they fall behind in the completion of their daily projects due to having to repeat the procedures to bring them up to a clinically acceptable level.

The practical examinations are utilized as an evaluation tool of the students' ability to perform procedures on their own. This is not intended as a learning experience, but rather an assessment of their progress in the course. The students have four practical exams with two evaluated portions. Each practical exam consists of an evaluation of a preparation and an evaluation of an insertion of a restoration. To allow for the fact that a student may have a "bad day" on one of the exams, each student is allowed to drop one preparation exam grade and one insertion exam grade for the semester. One of the criteria for passing the course is that the student must pass at least one of the three class II amalgam preparation exams and one of the three amalgam insertion examinations. Thus the student that simply can not complete a Class II amalgam on their own in the preclinical setting will be identified and will receive remedial training prior to being allowed to progress to the next preclinical course.

**San Antonio.** Pre-clinically, daily exercises are evaluated on a satisfactory/unsatisfactory basis using criteria sheets. Exercises that are deemed to have been completed in an unsatisfactory manner must be re-accomplished until they are performed at a satisfactory level. Along with the "S" or "U" grade, the student is able to see what grade they would have made if the exercise had been a practical examination. Practical examinations include tooth preparation and restoration to determine a student's level of competence. The student's grade in the course is determined, for the most part, by the grades he or she receives on the practical examinations. In order to take into account students that may have had a "bad day", one optional remake practical examination is scheduled at the end of each pre-clinical operative dentistry course to allow each student to replace a previously taken practical grade.

**Tennessee.** The first semester, students are evaluated for weaknesses and are given competencies to determine progress, but are not graded. When errors are identified, students are placed in small groups for assistance or in cases of more significant problems, may be provided one on one counseling. Records are kept on each individual student receiving either group or individual counseling in an attempt to ensure all receive ample opportunity for attention when indicated. In the second semester of the same course, competencies are continued, and students are given practical examinations, which are graded using a system of letter grades, not numbers. Due to lack of grades in the first semester, individualized feedback can be provided without fear of failure. This grading system is in the first year, so no conclusions can be drawn at this point in time.

## **2. When a student is identified as a weak student, what techniques are utilized to handle these students in the pre-clinical labs?**

**Baylor.** When a student is identified as needing additional skill development, the course director assigns an instructor to give mentoring to that weak student. Additionally, a tutor from the upper classes may be assigned to help the student after class hours. If a student fails, remediation is required.

**Houston.** Student and faculty initiated help sessions are arranged and scheduled outside of regular preclinical laboratory sessions.

Faculty not assigned to a specific group of preclinical students are available to work with individual students to provide closer supervision and instruction.

Weak or struggling students may be asked to devise an improvement contract, the goals of which are to: 1) identify unacceptable performance, 2) identify standards of acceptable performance, 3) identify performance improvement actions, 4) create a timeline for improvement, 5) develop remedies for breach of contract.

Hopefully, this exercise will encourage the student to think about and critically analyze their development and what it will take improve their understanding and performance.

**Louisiana.** They are given more work to do. All failures must be remediated until satisfactorily completed. Weaker students are given more attention outside of class. We usually try to document any extra attention.

**Mississippi.** See questions #1.

**Oklahoma.** If a student is identified as struggling in either the didactic or laboratory portion of the preclinic course, they are informed of their status in the course and tutoring is made available to them. In the past I have offered evening sessions in the lab to work with struggling students on procedures they are having problems with. We have a tutoring system set up also where selected fourth year students work some with struggling students in didactic or laboratory skills. If possible the instructor in that student's work area will try to spend some extra time with the student during scheduled lab sessions.

**San Antonio.** Students who do not perform up to expected standards are provided with tutors, and are encouraged to seek faculty input. Students who fail to achieve an acceptable level of competence by the end of the course are, at the discretion of the Student Promotion Committee, given the opportunity to take a remediation course.

**Tennessee.** When deficiencies are noted, students are divided into those exhibiting similar problems (i.e. long axis, width, depth, etc) and receive small group attention (3-4 students per group). Where more significant weaknesses are found, individualized attention is provided by the faculty, either during the lab period or after hours if necessary.

### **Teaching Techniques**

#### **3. What do you consider to be the best teaching aids for preclinical dentistry (ie. computer, illustrations, models)?**

**Baylor.** Our system of education is traditional:

- a. Lecture, reading, and observation
- b. Student works on typodont and extracted teeth
- c. Student treats patient with close supervision

The best teaching aids seem to be illustrations and models as well as requiring from the beginning that maxillary restorative procedures be done on the typodont mounted on a pole and working with a mouth mirror.

**Houston.** Illustrations (paper and computer generated), models, small group demonstrations, and a clear understanding by the student, communicated by motivated faculty, of the goals and objectives of operative dentistry procedures and concepts.

**Louisiana.** In my personal opinion, demonstration after lectures and presentations are most helpful. Then repetition.

**Mississippi.** Illustrations in required textbooks which are reinforced during lecture with diagrams using overhead projectors and 35 mm color slides. Also, models of preparations given out during pre-clinical labs.

**Oklahoma.** Demonstration videos of procedures are good because you can show all students at the same time, one way, and with good vision for all observers.

Models that demonstrate the desired outcomes are very good to allow the student to compare and analyze their preparations.

Self-evaluation and peer evaluation of preclinical projects.

Provide the student with a set of specific criteria that informs the student precisely how they will be evaluated for various procedures.

**San Antonio.** We think that life-sized typodont models of the completed preparations are the best preclinical teaching aids. However, to avoid inculcating a fixed preparation design, the model is best related and compared to an initial patient situation with the extent and location of caries involvement clearly defined. Illustrations of interim steps or clinical slides of comparable situations augment the value of the preparation model.



**Tennessee.** Currently using models and illustrations. It is anticipated that we will be transitioning to computerized simulators next year.

### **Curriculum**

**4. What section or department teaches full gold crowns or cast gold onlays at your school? What are the clinical requirements for these procedures?**

**Baylor.** Full gold crowns are taught and supervised by the Fixed Prosthodontics Division of the Restorative Sciences Department. Cast gold onlays and inlays are taught and supervised by the Operative Division.

There are no specific requirements for full gold crowns. The total requirements in Fixed Prosthodontics are 10 units for the third year.

In Operative, 3 gold castings (inlays or onlays) are required for patients. Four additional gold restorations are required as Progress Examinations on the typodont, two at the beginning of the year and the additional two at the end of the year.

**Houston.** Full gold crowns - The Department of Prosthodontics  
Cast gold onlays - The Department of Restorative Dentistry & Biomaterials

**Louisiana.** Onlays are taught in Operative Department. We are stretching the limit between onlays and full crowns in order for students to meet requirements. The students are required to have study models mounted in order to get a starting check. If the tooth to be restored is to be an abutment for a removable partial denture, the student must have an RPD diagnosis plan indicating the type of rest and retainer needed. All onlays will have an acrylic or composite provisional restoration fabricated at the visit the cusps are reduced.

The sophomore dental students must complete one (1) cast gold restoration.

The junior dental students must complete four (4) indirect restorations. Two of these must be gold, the remaining two can be indirect composite restorations. These are minimal requirements and some may actually do more

**Mississippi.** Full gold crowns: Operative and Fixed sections teach pre-clinic and clinic.  
Gold onlays: Operative (preclinical and clinic)  
Onlay requirement: 4 pt. Onlays, 1 dentof orm, full gold crowns: 6 on patients plus 1 competency

**Oklahoma.** Fixed Partial Denture department covers all indirect cast restorations.

There are no longer any "requirements" at our school.

There is a point system which insures that each student has a minimal number of clinical encounters to allow them the necessary prepare them to function in an independent practice. 255 points are needed to achieve this minimal number of experiences.

There is no minimum number of full gold crowns

There is a minimum number of three inlays or onlays.

**San Antonio.** The division of Fixed Prosthodontics in the Department of Prosthodontics teaches all cast gold restorations.

In the junior year, under the "Team" system, students must pass competency examinations involving the clinical procedures for a gold crown and a ceramometal crown. Before each student is allowed to attempt a competency examination, he/she must do a minimum on one crown of that type. Depending on how well the student did on the first attempt, their Fixed Prosthodontic advisor for the team may require him/her to do another crown before attempting the competency examination. Therefore, there is no uniform requirement for all students. The number of castings is dependent upon the level of competence of the student.

**Tennessee.** All cast restorations are currently taught in fixed prosthodontics division of the restorative department. There are no specified requirements for full gold crowns, inlays or onlays. Students must complete a minimum of 6 fixed units to successfully complete the junior requirements and 26 units to complete graduation requirements. Only prepared teeth count as a required unit. Pontics do not count as a unit in terms of graduation or promotion requirements.

#### **5. How much of their own laboratory work are your students required to perform themselves.**

**Baylor.** Gold castings are to be done by the students but this is not carefully supervised. In the fourth year in General Dentistry they are permitted to use a professional laboratory. Porcelain onlays and the porcelain on porcelain veneer crowns are processed by professional laboratory technicians and supervised by the Fixed Prosthodontics faculty. (In the preclinical operative course, it is required that all waxing and casting be done by the student.)

**Houston.** Preclinically: All laboratory work is performed by the student.  
Clinically: All laboratory work for gold inlays and onlays is performed by the student.  
All laboratory work for full gold crowns is performed by the student until they complete their "minimal essential experiences", then all work may be submitted to the in-house laboratory.  
All indirect composite and porcelain work is submitted to the laboratory.

**Louisiana.** The students must pour all models and trim their dies. This year they have the option to send the trimmed die to a commercial lab for the casting to be fabricated. The student must complete and evaluation form for the returned casting, evaluating contours, margins, fit, occlusion and finish. This form is a daily grade. If the student does his own casting he must present the wax pattern for a grade.

**Mississippi.** Students are required to do all model and die work for any fixed procedure. For all gold work, students are required to wax and invest. Casting is done by a laboratory technician.

**Oklahoma.** After the completion of 85 points (equivalent of 8-10 units), the student has the option to have the lab complete some or all of their lab work. They are credited with fewer points if the lab does the work. After 85 points, points are awarded on the following basis:  
Full credit for all points are awarded to the student if they do all of their own lab work.

90% of the points are credited if the student allows the lab to complete the casts and dies.  
65% of the points are credited if the student allows the lab to complete all of the lab work.

**San Antonio.** Students are required to pour, trim and mount their own master casts.

**Tennessee.** Lab work: 3rd year students are required to wax all fixed work, but castings and any porcelain is done by lab personnel. 4th year students are required to have all model work completed including mounting casts and ditching dies. Lab personnel will complete any remaining work. Students may perform lab procedures if they desire.

**6. What is your opinion of the fissure-carries document soon to be distributed from the Academy of Operative Dentistry.**

(This item has been eliminated because the document will probably not be distributed in time for review prior to the CODE meeting.)

**Operative Techniques/Materials:**

**7. What type of matrix system(s) is/are utilized in student pre-clinical and clinical training for obtaining proper proximal contours with posterior resins?**

**Baylor.** The Composi-Tight system has been found to help create the tightest, most satisfactory proximal contacts and contours for direct posterior composite resins.

**Houston.** Composi-Tight sectional matrix system.  
Tofflemire matrix system utilizing bands (Tofflemire and Ho bands) that have been contoured (burnished) prior to application.

**Louisiana.** We are using the Tofflemire matrices. We also have available the Compsi-tight system and the ContactMatrix by Danville. Both segmental matrix systems are working fairly well from what I've seen in clinic. They have reduced the incident of poor proximal contacts. Limited to small conservative boxes.

**Mississippi.** Pre-clinical - Introducing Composi-tight this year  
Clinical - 1) Micro band 2S or 3S (.0005 at thinnest area)  
2) Palodent and Composi-tight System  
3) Ultrathin bands  
4) Auto matrix II with deadsoft .001 metals bands

**Oklahoma.** At this time we are utilizing a technique which involves prewedging during the preparation, the a tofflemire with a 0.001 dead soft matrix band.  
We introduce the use of the Bitine ring and sectional contoured matrix in the preclinic course, but at this time do not have it available except on a case by case basis in the clinic.

**San Antonio.** The standard #1 Tofflemire .002 inch stainless steel band, the Denovo spot-welded matrix system, and clear plastic matrices are used in pre-clinical courses. In

clinic, Tofflemire #1, #2 and #3 bands (.002 ô) #1 bands (.0015ö), and Dixieland bands are used with the Tofflemire retainer; the Denovo spot-welded band system and Caulk Automatrix system are also available. In addition, sectional contoured bands, provided with ôBiteneö-style ôringsö (Compositite system) are available for placement of posterior resin composite restorations.

**Tennessee.** Currently Class II composite resins not being taught. This will be added to the curriculum as the esthetic dentistry course is expanded to include a laboratory section in the 2001-2002 academic year. When such restorations are performed in the clinic, it is done one on one with a faculty member, who selects the matrix system of their individual preference.

**8. Are self-etching adhesive systems used in pre-clinical and/or clinical situations, or are you currently using a single bottle or separate primer/adhesive system?**

**Baylor.** At this time we do not use self-etching adhesive systems. We have the following single bottle materials available for use: Single Bond and Prime & Bond NT. We have the following primer/adhesive systems available for use: Scotchbond Multi-Purpose Plus and All-Bond 2 in addition to the bonding systems that come with the individual composites which are available (Z-100, Herculite XRV, and Prisma TPH).

**Houston.** Preclinical:

first year operative students use a two-bottle primer/adhesive system.

second year operative students use the same two-bottle system; however, they also use single bottle (unit dose) systems and one self-etching system for some projects.

Clinical: Two bottle primer/adhesive systems are available as well as single bottle (unit dose) systems; no self-etching adhesive systems are utilized at this time.

**Louisiana.** We are only using the Scotchbond Multipurpose Plus dentin bonding system. It give the best results. Bond strength, etc.

**Mississippi.** We use a separate primer/adhesive system (Probond). Single bottle adhesives are only used with compomers as a faculty request item.

**Oklahoma.** We use All Bond 2, which has multiple steps for etching, priming and bonding. It has been fairly well proven clinically. This material is good because it can be use to meet all of our needs in our clinics. There have been mixed results reported in lab studies concerning the self-etching systems. Some studies have reported self-etching systems have had significantly lower bond strengths (especially to enamel) in lab studies. Others report equal or better bond strengths.

Hara AT, Amaral CM, Pimenta LA, Sinhoreti MA. Shear bond strength of hydrophilic adhesive systems to enamel. Amer J Dent 1999, 12(4):188-4.

In-vitro study on bovine teeth. Compared shear bond strength of four hydrophilic adhesive systems: one multipurpose-bottle, two one-bottle adhesives; and on self-etching adhesive. It was concluded that the self-etching adhesive did not provide as good a bond to enamel surface, as did the one- and multiple-bottle systems.

Kanemura N, Sano H, Tagami J. Tensile bond strength to and SEM evaluation of ground and intact enamel surfaces. Journal of Dent 1999, 27(7):523-530.

In-vitro study using human teeth to evaluate the bonding of four adhesive systems to ground and intact enamel surfaces. The conclusion stated that the bond strengths of the self-etching systems had significantly lower bond strengths to intact enamel than the bonding system using a separate phosphoric acid etchant.

Cardoso PE, Braga RR, Carrilho MR. Evaluation of micro tensile, shear and tensile tests determining the bond strengths of three adhesive systems. Dent Mater 1998,14(6):394-8.

In-vitro study using human teeth to determine bond strength between dentin and tree dentin adhesive systems by means of micro-tensile, shear and tensile tests. The conclusions stated that the one-bottle adhesive system obtained higher bond strength values than the self-etching adhesive upon shear and tensile strength tests.

Yoshiyama M, Matsuo T, Ebisu S, Pashley D. Regional bond strengths of self-etching/self-priming adhesive systems. Journ of Dent 1998, 26(7):609-16.

In vitro study measuring bond strengths of self-etching adhesive systems at various portions of human tooth enamel and dentin. The results suggested that the self-etching priming systems produce good adhesion in most dentin, but bonding to enamel and apical root dentin need improvement.

**San Antonio.** We are using primarily the fourth generation material, Scotch Bond Multipurpose (separate primer and adhesive). We also use OptiBond Solo (single component adhesive) in the clinic and pre-clinic.

**Tennessee.** Self etching systems not currently being used. Presently using separate primer/adhesive system.

All of our material systems are currently under review. We will likely go with a single bottle system, but no selections have been made at this point in time.

**9. Are posterior condensable/packable composites taught clinically at your school? If so what manufacturers?**

**Baylor.** We have only one posterior packable composite available: SureFil (Dentsply-Caulk) but it is seldom used. (Mostly we use Z-100, Herculite XRV, or Prisma TPH.)

**Houston.** Posterior packable composites are taught in the second year operative course. SureFil (Dentsply/Caulk)

**Louisiana.** No. Some mention is given in the didactic portion but is not used clinically. Dr. Gallo has a study that will shortly appear in Operative Dentistry, showing problems with these materials. Inability to adapt well to the internal walls of preparations. This requires a layer of flowable resin to be placed first. The wear resistance is no better than the conventional resin we use.

**Mississippi.** Packable composites are mentioned and introduced in lecture however they are not taught as a pre-clinical exercise. We have Surefil and Prodigy condensable as faculty request items in the clinic (Caulk and Kerr).

**Oklahoma.** No. Packable composites are discussed in lecture during preclinic courses, but are not being used routinely in our clinics. Are there long term studies?

**San Antonio.** We are not currently using packable composites in the clinic or pre-clinic.

**Tennessee.** Posterior condensable composites not currently being taught.

## CODE Region III Attendees - 2000

NAME	SCHOOL	PHONE	FAX	EMAIL
Marvin Hitsh	Baylor College of Dentistry TAMUS HSC	214-828-8384	214-874-4544	mhitsh@tambcd.edu
Stanton L Cobb	Baylor College of Dentistry TAMUS HSC	214-828-8281	214-874-4544	scobb@tambcd.edu
Allan H Ripps	Louisiana State University School of Dentistry	504-619-8543	504-619-8549	aripps@lsuhsc.edu
James Fitchie	University of Mississippi School of Dentistry	601-984-6036	601-984-6039	jfitchie@sod.umsmed.edu
Scott M Phillips	University of Mississippi School of Dentistry	601-984-6042	601-984-6039	smphillips@sod.umsmed.edu
Thomas L Coury	University of Oklahoma College of Dentistry	405-271-5735	405-271-3423	thomas-coury@ouhsc.edu
Terry J Fruits	University of Oklahoma College of Dentistry	405-271-5735	405-271-3423	terry-fruits@ouhsc.edu
Lynn Montgomery	University of Oklahoma College of Dentistry	405-271-5735	405-271-3423	c-lynn montgomery@ouhsc.edu
Leon Bragg	University of Oklahoma College of Dentistry	405-271-5735	405-271-3423	leon-bragg@ouhsc.edu
Jeff Lunday	University of Oklahoma College of Dentistry	405-271-5735	405-271-3423	jeff-lunday@ouhsc.edu
E.W. "Ned" Turner	University of Tennessee College of Dentistry	901-448-6052	901-448-7104	nedturner@utmem.edu
William Tate	University of Texas Dental Branch - Houston	713-500-4264	713-500-4100	wtate@mail.db.uth.tmc.edu
James B Summitt	University of Texas Health Sciences Center- San Antonio	210-567-3690	210-567-6354	summitt@uthscsa.edu
Jerry W Nicholson	University of Texas Health Sciences Center- San Antonio	210-567-3693	210-567-6354	nicholson@uthscsa.edu

**Enclosure #1**  
**CODE REGIONAL MEETINGS REPORT FORM**

**REGION:** IV (Great Lakes)

**LOCATION AND DATE OF MEETING:**

West Virginia University  
Morgantown, VA

**CHAIRPERSON:**

**Name:** Robert G Rashid  
**Address:** 305 W 12<sup>th</sup> Avenue  
Ohio State University  
Columbus, OH 43218-2357

**Phone #:** (212) 305-7069  
**Fax #:** (212) 305-8493  
**E-Mail address:** rashid.1@osu.edu

**LIST OF ATTENDEES:** (including Phone #, Fax #, E-mail address - sample format attached)

See attached

**SUGGESTED AGENDA ITEMS FOR NEXT YEAR:**

1. Rural/Community Service; Does your school require a time period for this service? how much and where is the service rendered?
2. Remediation: How does your school handle clinical remediation?
3. Mock State Boards: How does your school prepare candidates for state boards? How many mock boards (Number and type such as NERB and WREB)/ How much clinical time is dedicated to this(Days)?
4. What are the teaching responsibilities of your operative clinical faculty? (What disciplines do they teach in the clinics?) What percentage of time is devoted to clinical and preclinical teaching?

**LOCATION/DATE OF NEXT YEAR'S MEETING:**

**Name:** T.Roma Jasonevicius  
**Mailing Address:** Case Western Reserve University  
10900 Euclid Avenue  
Cleveland, OH 44106-4905

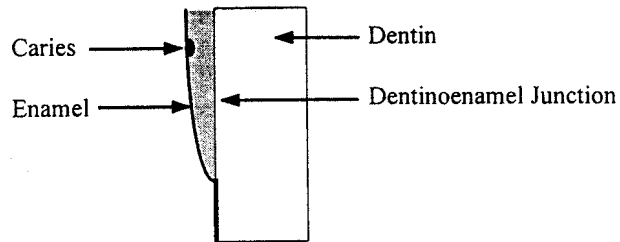
**Phone #:** (216) 368-2237  
**Fax #:** (216) 368-3204  
**E-mail address:** trj2@po.crwu.edu  
**Date:** TBA

Please return all completed enclosures to Dr. Larry D. Haisch, National Director, UNMC College of Dentistry;  
40<sup>th</sup> and Holdrege Streets; Lincoln, NE 68583-0750. Deadline for return: 30 Days post-meeting  
Office: 402 472-1290 Fax: 402 472-5290 E-mail: LHAISCH@UNMC.edu  
Also send the information on a disk or via e-mail with an attachment,  
indicating the software program and version utilized.

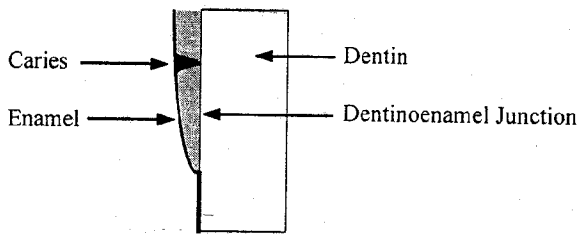


## 2000 NATIONAL CODE AGENDA

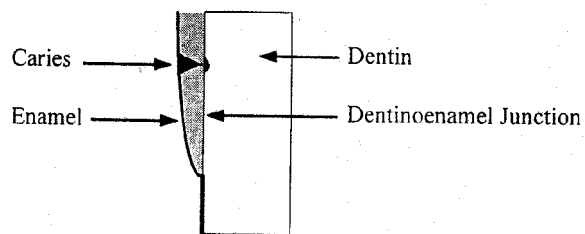
Answers are to be evidence based (please site) where appropriate.



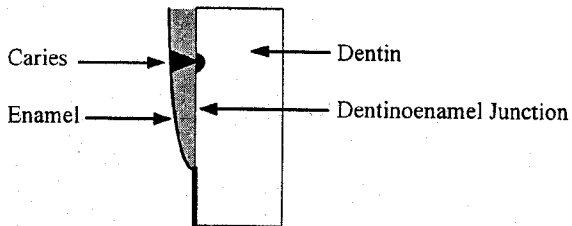
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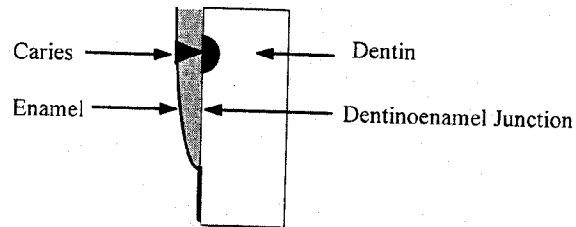
2.



3.



4.



5.

**From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:**

## **2000 NATIONAL CODE AGENDA**

Answers are to be evidence based (please site) where appropriate.

From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:

### **1. Which diagram represents the point at which a preparation/restoration is indicated?**

**Northwestern University.** #3

**University of Illinois, Chicago.** #3

**OSU.** Generally treat at #3, though some faculty are slightly more aggressive in treatment.

**West Ontario.** #3

**CWRU.** #3, however some faculty suggest #2 when preparing for boards.

**WVU.** #3

**Indiana.** # 3, 4 and 5 (other factors: clinical evidence, cavitation, one visit vs. long term care)

**Michigan.** #2 - #5. Entire range within faculty. Wide range of opinions at our school ranging from #2 - #5. Most common is #2 - #3. However, question is too limited and ambiguous and drawings not clear. For instance, what is patient situation? Where is pulp in the drawing? Is #5 still in the outer 1/3 of dentin? For good answer we need much more information regarding patient:

diet; history (medication, caries, fluoride); caries risk; age; how has lesion existed; compliance with preventative measures; patient motivation; other Tx indicated in same tooth (e.g. occlusal); saliva (stimulated/un-stimulated flow, quality); bacteria count (CFU).

Policy for caries diagnosis is in process of being implemented (Sept '01, document attached)

Decision trees and charting in discussion (pilot in D2 class, see attached).

### **2. Would the number change/remain the same for a patient of low caries risk? What is the evidence?**

**Northwestern.** For low caries risk patients, the number could increase, if the patient has good hygiene, there could be remineralization of the enamel lesion seen in #3. The evidence is that we have seen later films that show no progression or even less radiographic evidence of lesion. However, if multiple lesions appear, then may think of restorative treatment.

**University of Illinois, Chicago.** No, remain the same.

**OSU.** No official policy at this time. We have not defined a school wide program for identification or treatment based on caries risk.

**West Ontario.** No, remain the same.

**CWRU.** Not a formal policy at this time, based on preceptor in clinic.

**WVU.** Have a formal caries risk assessment program.

**Indiana.** 4 and 5 only. Other factors: clinical evidence, cavitation, one visit vs long-term care.

**Michigan.** Tend to observe - yearly recall w/ prophylaxis only,  
Lower frequency of radiographs - 2 yr intervals,  
Faculty opinions range from "no Tx" to "restoring".

### **3. Would the number change/remain the same for a patient of high caries risk?**

**What is the evidence?**

**What is your school's treatment protocol for patients of:**

- a) Low caries risk
- b) High caries risk

**Northwestern.** For high caries risk, we would restore teeth with lesions as in #2. We have seen lesions such as this progress more rapidly within a matter of months.

- a) For initial lesions may watch and reevaluate at later date or place preventative resins.
- b) For high risk, may perform caries control followed by treatment plans that often call for root canal therapy, core buildups and crowns in addition to other less aggressive procedures. Also place patient on fluoride treatment such as Prevident.

**University of Illinois-Chicago.** Not clear how to define.

- a) For low risk, place patient on 6 - 12 month recall.
- b) High risk, delay the reconstructive phase, diet modification recommendation, recommend fluoride treatments, 4 month recall.

**OSU.** Possibly more aggressive treatment (#2). However, this is usually an individual decision made by a faculty member involved. We only have experience guiding us at this time, we haven't developed a formal policy based on evidence.

- a) Low risk - Normal hygiene recall. Treatment of lesions as above. Treatment more likely to use preventive resins and sealants.
- b) High risk - -Increased oral hygiene instruction. Many times managed by dental hygiene. Some faculty will address fluoride prescriptions.

**West Ontario.** Preparation and restoration would be call for in #2.

- a) Low risk - "wait and see", if incipient lesions progress. Patient is reevaluated yearly and advised of lesions and review of oral hygiene will be done.
- b) High risk - Lesions that are radiographically detectable and are half way through enamel would require counseling with oral hygiene.

**CWRU.** We don't have a formal policy at this time and would be based on preceptor in the clinic. We are presently working on calibration. Comprehensive care for patients is not under the direction of the restorative department. Consider the use of fluoride in high risk.

**WVU.** We have a formal Caries Risk Assessment Program, which would include diagnostic excacation ,temporization.

**Indiana.** 3, 4, 5 (other factors: clinical evidence, cavitation , one visit vs. long term care.)

- a) Low risk - Prophylaxis, oral hygiene instruction, monitor caries activity.
- b) High risk - remove caries, diet analysis, Peridex, fluoride/Prevident, begin restorations.

**Michigan.** Yes, it will be changed for High Caries Risk (HCR) patients. More aggressive surgical approach (but #1 would be restored). School's Tx protocol (to be attached). Document is accepted but not fully implemented yet (Aug 2001).

- HCR:
- increase frequency of recalls (3-month recall) in particular if incipient (not-cavitated) lesions are present.
  - In-office FI-application, home fluorides.
  - CHX Tx (some faculty).
  - Diet analysis and modification.
  - Increase x-ray frequency.

**Pitt.** We just started a module system with the 4<sup>th</sup> year students. No formal delineation with high vs. low.

**4. Indicate which drawing is minimally acceptable as a board lesion for the dental licensure board at your school/in your region. As several different board examinations may be given, please indicate the drawing and the respective examination.**

**Northwestern.** The minimally acceptable lesion stated by the boards in our area (NERB and CRDTS) is \$2. In reality they often accept lesions that are 2/3 to 3/4 penetration through enamel.

**University of Illinois-Chicago.** NERB, #3, CREDIT, minimal #2, ideally #3.

**OSU.** NERB requires #2 - 3, WREB is #2.

**West Ontario.** #3 into dentin. We do not have regional boards.

**CWRU.** 2 is minimally acceptable, the clinical faculty suggest #3 is better.

**WVU.** #3 for NERB

**Indiana.** #2 for the Indiana State Board.

**Michigan.** #2 - #3. Ideally #3, but #2 is accepted for Board: once it reaches/touches dentin. Some faculty say: Board is OUT-OF-DATE!!

**Pitt.** #2 for NERB.

**5. Previous CODE agendas have dealt with caries risk assessment. In addition much is heard about remineralization, minimum intervention, and the use of sealants.**

**How is all of this really affecting:**

**A. Decisions to treat**

**B. Preparations Designs**

**C. Choice of restorative materials**

**Northwestern.** a) We are doing more preventive resins , enameloplasty, and delaying of treatment than in the past.

- b). We have always tended to be conservative in preparation design; this has not changed much in recent years.
- c). We are using more posterior resins in selected cases, but still a considerable number of traditional amalgam and cast gold restorations are done.

#### **University of Illinois-Chicago**

- a). Depending on the instructor, we are currently promoting conservative preps.
- b). Once again, depending on the instructor, we are teaching slot preparations. Still generally conservative.
- c). For smaller lesions we use composite. larger lesions we use amalgam. Glass ionomers are used more as a liner, not a restoration.

#### **OSU.**

- a). Increased awareness but no major change. We used to treat at #2, but have shifted initial treatment decisions to #3.
- b). For minimal preparations, we really haven't changed. We are teaching slot preparations pre-clinically.
- c). Increased use of sealants and PRR resin restorations in addition to glass ionomers. Usage of composite in posterior is also increasing, We have established a committee to oversee the materials used clinically and pre-clinically. Policy now states that we need to use pre-clinically before introducing into the clinic.

#### **West Ontario.**

- a). We are using more sealants, more resins and delaying treatment for traditional restorations.
- b). We are very conservative, preparations are being done when possible.
- c). More sealants and flowable resins are being used although we still use amalgam and conservative posterior composites.

#### **CWRU.**

- a). More conservative in approach and philosophy but still somewhat traditional.
- b). More conservative although not as conservative as some of the other schools. No slot designs in preclinical teaching, some in clinic and described in lectures. More traditional preps designed more conservatively.
- c). Glass ionomer but used more as a liner than as a restoration and to seal occlusal surfaces for posterior composites. The choice materials is determined by the clinical dean with some input from clinical faculty.

**WVU.**

- a). We use caries risk assessment as a tool.
- b). Somewhat conservative in design, we teach box and slot design.
- c). we use fluoride, sealants, preventive resins and onlays instead of crowns traditionally.

**Indiana.**

- a). Caries risk affects the use of Chlorhexidine, fluoride regimens, Prevident prescriptions, etc.. A formal system is not in place but efforts are underway to calibrate full and part-time faculty. Most full time operative faculty consider caries risk - past, present and future, - in decision to treat, but this is not uniform throughout all faculty.
- b). We use more sealed composite resins on occlusal surfaces that we have in the past. More box/slot preps are being done on Class II's. Minimum intervention is practiced by most full time faculty. Once a formal calibration and treatment regimen is identified, this will occur on a universal basis.
- c). we use glass ionomers primarily for most Class V restorations, especially in patients with high caries risk. Indirect restorations are used sparingly.

**Michigan.** No standard - see below.

- a). More observes on Tx plans.
- b). More conservative prep designs and extensions (PRR); box-slot Class 2.
- c). Greater use of adhesive materials (GIC as restorative, composite resin for PRR on occlusal molars); more repairs vs, replacements, reseal of margins.

**Pitt.**

- a). We have no standard policy in effect.
- b). Preparations designs are conservative, clinically difficult to assess with so many part time faculty.
- c). we use preventive resins, air abrasion, posterior composites.

**6. What is the evidence for use of compomers?  
How are they being used in the clinics?**

**Northwestern.**

- a). We have only tried these in limited situation, they have not really caught on in comparison to composites , glass ionomers and
- b). Used very minimally by a few of the faculty.

**University of Illinois-Chicago.**

- a). No evidence, only occasionally use Dyract.
- b). Used only on cervical lesion caries which is supragingival.

**OSU.**

- a). No evidence collected yet.
- b). Compomers are not used in our clinic, only used in the faculty practice at the practitioner's discretion.

**West Ontario.**

- a). We feel that compomers are suitable in pedodontics, but a poor choice for adults. We prefer either a microfil or hybrid resin, depending on the flexibility/wear requirements.
- b). In Pedodontics only and in Class I, II, and III situations.

**CWRU.** Not being used at this time.

**WVU.** Flowable resin available only in special situations and under faculty supervision.

**Indiana.** Compomers are primarily being used in Grad Operative clinic for Class V abrasion lesions. Currently not used in undergraduate clinic. Primarily use glass ionomers or composite resins with single bonding agents.

**Michigan.** a). None really - only ease of manipulation and inherent adhesion, hence increased retention (Class 5)

Indications:

Need for FI-release

RMGI

Need for esthetics:

Composite Resins

Need for both in HCR patients:

Compomers

(some) FI-release plus esthetics: compomer indication in particular in mouth-breathers, or xerostomic patients.

- b). Not available to UG students.

**Pitt.** We currently have no set policy on materials, compomers are generally used on Class III, V lesions.

## 7. What is the evidence for use of flowable composites? How are they being used in clinics?

**Northwestern.** We have not seen any long-term studies that would support the use of flowable composites as routine dental materials. When they are occasionally used, that are used as sealants or preventive resins.

**University of Illinois-Chicago.** Used in small cavity preps, block outs.



**OSU.** a). We have not collected any evidence yet.  
b). Used only in faculty practice.

**West Ontario.** a). No evidence collected yet.  
b). They are used as occlusal sealants very conservatively in Class I situations to repair defective margins (amalgams and crowns) and as first gingival layer in Class II restorations.

**CWRU.** Not being used in the clinic at this point.

**WVU.** Available only in special situations.

**Indiana.** Being used primary as pit and fissure sealants.

**Michigan.** No evidence for flowables, only ease of use. Randomly used in clinics only for PRRs and repairs. Used for high flow-low physical properties areas. Isolated use as liner in posterior composites.

**Pitt.** We use all materials, no set policy on materials.

## **8. What teaching guidelines and materials are used for build-ups?**

**Northwestern.** We have a set policy on build ups. In general for posterior teeth, the order of preference of materials is amalgam, cast gold (if on a root canal treated tooth), then composite. Taken into consideration is amount of tooth surface remaining, vitality of tooth, and method of retention of the buildup. If substantial tooth structure remains, composite resin or fluorocore is used (at least 60% of the tooth crown).

**University of Illinois-Chicago.** Light and chemical cured composites are used and also amalgam for buildups. Cast post and core for anterior teeth. Prefabricated post and core for endodontically treated teeth.

**OSU.** Clinic policy uses amalgam as the core materia. Small repairs are made with glass ionomer at preparation time. Pins and wells are appropriate for retention. We do not rely on any form of bonding for retention/resistance form. The current available amalgam is Permite C with Tytin.

**West Ontario.** We use amalgam or hybrid composite resin. Occasionally core paste as well.

**CWRU.** Depending on the amount of tooth structure remaining and the internal anatomy of the tooth. Choice of material is determined by clinical preceptor, materials

available: para post system, amalgam, core paste (Denmat), composite TPH. Amalgam post and core is used if a significant amount of tooth structure remaining.

**WVU.** We use pins and slots if the tooth is vital. Occasionally we use a bonding agent with mechanical agent. We use amalgam and fluorocore is used under faculty supervision. If post is needed we refer to fixed prosthodontics.

**Indiana.** Amalgam is used for most buildups where adequate retention exists. Cast post and core for teeth with insufficient tooth structure to retain amalgam. We will have symposium on this issue in December to develop a consensus that is evidence based.

**Michigan.** Bonded cores not used routinely (mechanical retention advised). Both pin and intra-coronal retention with amalgam cores. Ti-Core is used but no self-cure bonding agent is available, so it defeats the purpose of using a bonded core. Discussion is ongoing. Individual faculty may use posterior composite resin with bonding agent. Both cast and pre-fabricated posts are used clinically and taught pre-clinically.

**Pitt.** We use pin retention amalgams, cast post and core, Amalgabond, whatever is available.

**9. a) What is the evidence for routine use of cavity sealants with amalgam restorations?**

**b.) What is the clinical usage?**

**Northwestern.**

- a). Operative Dentistry, July-Aug, 1999, Vol. 24, #4, pp. 203-209.
- Operative Dentistry, Nov-Dec, 1999, Vol. 24, #6, pp. 337-343.
- Operative Dentistry, Mar-Apr, 2000, Vol. 25, #2, pp. 121-129.

b). We have been using bonding agents with amalgam for the past 4-5 years. The two most often used are Amalgabond Plus and Optibond Solo. Virtually no patient reports of postoperative sensitivity. Copal varnish is still used at times by a few faculty.

**University of Illinois -Chicago.**

- a). Recurrent decay, sensitivity, microleakage study.
- b). Routinely used, 100% in all restorations.

**OSU.**

a). We have not collected the evidence yet. We had 3 summers of student run/faculty guided research that looked at Gluma, Advance, Amalgabond and Copal varnish under amalgam restorations with the goal of reducing patient sensitivity. Copal

varnish is used because of cost benefits vs. the very small decrease in sensitivity with other materials.

b. Copal varnish is used with glass ionomers used in deeper lesions as a base/liner (especially over dycal liners).

**West Ontario.** a). No response.  
b). we use both copal varnish and bonded resins as sealant. Copal varnish is used easily for inexperienced students to apply under amalgam restorations.

**CWRU.** a). Routine cavity sealers.  
b). We use copalite under amalgam. The students do one exercise on the use of bonding agents (Optibond Solo) with amalgam. Some faculty suggest use of bonding for a seal.

**WVU.** Both methods are used in pre-clinic. The fee increases with each resin bonded restoration.

**Indiana.** We still use copalite cavity varnish primarily. Not using amalgam bonding agents as a cavity liner.

**Michigan.** References etc.: see hand-out CE course (ME McLean)

Depends on goal:

- post-op sensitivity: mixed results in clinical studies (inconclusive).
- seal the dentin: in vitro studies look promising but are only short term. No studies past one year and 1 year study showed trend towards increased leakage.
- retention of restoration.

Two essential issues:

- 1) for retention you will need a filled, self- or dual- core bonding agent like Amalgabond, not the regular bonding agents.
- 2) need for good isolation.

In UG clinics:

- bonded amalgams: not yet (sporadically used in clinic by selected faculty) but we start to teach it this year as an adjunct for retention (Sept '00)
- copalite underneath amalgam is mainstream.

Bases & Liners policy implemented (document attached)

**Pitt.** We currently use copal varnish and glass ionomers.

**10. Schools are utilizing various levels of simulation in pre-clinical labs. (Heads, torso, computer, Dent Sim, etc., in comparison to “the pole and dentoform.”)**

- a) Do the sophisticated systems make a difference in the clinical performance?
- b) To what degree and what is the evidence?
- c) report on any controlled studies underway.

**Northwestern.** We think the students are doing better clinical work earlier in their experience, Having a simulation lab seems to have minimized the adjustment period in the transition from preclinical to clinical training.

**University of Illinois-Chicago.** In the pre-clinic we use the Kilgore typodont with aluminum head on a stick, in the clinic a mask is added. Evidence is not know at this time.

**OSU.**

- a). We use aluminum head and latex mask, see answer #11 below.
- b). No direct evidence.
- c). None

**West Ontario.** Not sure about tooth preparations/restorations but it certainly helps students develop proper posture, finger rests, etc.. Telescopic loops encouraged.

**CWRU.**

- a). While we do not have one of the newer systems, we do use a head metal and latex mask/Kilgore typodont and we presently have a committee to study this issue.
- b). Evidence may not be in.
- c). None.

**WVU.** We use the Kilgore typodont, we also use natural teeth and simulated teeth.

**Indiana.**

- a). Not applicable, we have the pole and dentoform.
- b). Not apply.
- c). reviewed abstracts for ADEA that suggested improvements were realized, should be published in the journal of Dental Education.

**Michigan.** We are currently in the state of change and looking at different labs. Procedures are hard to teach without simulation. We are trying 5 different units in the post grad area. We have the typodont on stick. We just changed to Columbia, but also have the Kilgore around.

**Pitt.** We are currently using a dentoform on post with latex mask. We see no difference than without mask.

**11. Do the sophisticated systems decrease the amount of time necessary for students to make the transition from pre-clinic lab to clinic? By what amount, and what is the evidence? report on any controlled studies underway.**

**Northwestern.** a). Yes, we have seen this.  
b). the transition period is more like weeks than months. The evidence is just observation, no data collected.  
c). Not aware.

**University of Illinois-Chicago.** Not aware of any.

**OSU.** We have, over the last 5 years, moved to aluminum heads and latex face masks pre-clinically. The goal was to force use of clinically appropriate treatment positions and develop mirror skills. Informal student feedback indicates that this has helped. However, early clinical experiences which are being integrated into the first two years, are also giving the students a type of simulation experience the first two years. It is evident that, even with the use of skull and mask, the placement of rubber dam on a live patient is new experience.

**West Ontario.** Over the four years of our experience, I would definitely say “Yes” and substantially. Our students going into their first clinical year(3rd year) are seeing patients soon due to more confidence.

**CWRU.** Comments from interviews with faculty from other schools indicate they need to increase number of faculty per student.

**WVU.** No response.

**Indiana.** Unknown, we have te “pole and dentoform’.

**Michigan.** a). We cannot answer this. We have our students introduced in clinic from day one. This way we create a seamless transition from pre-clinic to clinic.  
b). Evidence: *Their clinical productivity as 3<sup>rd</sup> year students improved* (AADS Vancouver 1999)  
c). We are tracking data, no reporting planned for ADEA 2001, but for 2002.

**Pitt.** No response

**12. What is your school's current utilization level of technology? What is being used and how? (Interactive videos, course web sites, paperless, etc.) Is learning being improved and what is the evidence?**

**Northwestern.** Computers are not used for instruction in Restorative Dentistry. There have been no pre-clinical courses since 1998. If we were not facing closure, there would probably have been an initiative to do this.

**University of Illinois-Chicago.** None in operative, cariology program to be loaded to website soon.

**OSU.** Clinics are managed by a system that requires student usage for some procedures (check appointments, enter treatment plans). We have an IS advisory committee evaluating the next steps to proceed with for computing (especially with the clinical system), It is a resource-limited process.

All lecture rooms have overhead projectors permanently mounted, two computers (Mac and PC) laserdisc, video tape machines, slide projectors. electronic overhead projectors and internet connections.

The pre-clinic laboratory has a video player, along with a high quality video camera, which feeds to monitors throughout the lab.

There is full support for web page development, including our own web server, the faculty need to find time for transition of slides and lecture techniques to the electronic format. There is a support computer lab with color printers and scanners.

**West Ontario.** We have live video demos, some courses are available on websites, we still do most teaching in the traditional lecture either using 35 mm slides or video projectors.

**CWRU.** We are working on improving the use of technology, we are in the first stages of planning. There is an increased number of courses on the Web, interactive videos. We had one experience with long distance learning with a pedo course and received mixed to negative responses from the students.

**WVU.** We are currently learning and struggling with the new Axium management system, with mixed reviews. We have a newly formed Information Technology department that offers PowerPoint, scanning, video equipment, etc.. We have a few courses on the Web.

We currently are doing a survey on the Axium system, the responses in the first 3 months were positive, the responses in the 6 month s were negative basically due to timing. There will be terminals in the preclinical lab soon.

**Indiana.** Students are required to purchase computers. We have a website for tooth morphology. Hasn't improved performance on the same exam over years data, but

scores are no worse. It reduces faculty time to teach courses. Operative courses use material on Web as an adjunct to lectures. ELMO demonstration units are used in lab along with computer projectors.

**Michigan.** We are currently moving towards more digital technology, i.e. Powerpoint, etc.. We were just informed that AXIUM is to be installed. We have a computer system learning center in the school, several lectures on the Web. Learning is being improved.

Use of technology in teaching: in general low, but starting

- Video-tapes (some are 20 yrs old - ACORD project; parts still in use).
- Daily demo's in combination with visualizer.
- Since Sept '00, the lecture halls are furnished with computers and data-projection for net access and PPT presentations.
- Clinic management system: Axiom will be introduced in Jan. 2001.
- Web: many course outlines.
- Some courses (Tx planning, caries diagnosis, radiography, computer use, public health courses) with web-conferencing, discussions, in combination with email.
- Few CE on the web.
- Distance learning to remote sites by streaming videos of lectures (Oct '00).
- CAIDENT Computer lab in dental school for student use. Will be combined with library to a resource center.
- Chairside computers in grad clinic.
- Faculty Development: - courses available (Faculty Exploratory Workshops are encouraged, but where's the time?)
- University wide:
  - Course Tools (web): Mainly course management plus evaluation
  - PPT: for presentation.

Learning being improved?

Who knows? Improvement may be a result of other changes and emphasis on teaching/learning methodology and not necessarily technology.

Evidence:

experimental evidence of use of interactive CD-ROM (comparison between 2 classes):  
10% improvement in test scores (AADS 2000)

**Pitt.** Basic Video technology, PowerPoint, etc..

**What clinical studies with direct or indirect restorative implications are being conducted at your school? Give a brief description.**

**Northwestern.** Not applicable.

**University of Illinois-Chicago.** None

**OSU.** Only one clinical study at this time - fiber reinforced resin bridges (3 units).

**West Ontario.** No studies.

**CWRU.** Several ongoing studies on dental materials, assessment of microleakage.

**WVU.** Only known clinical studies are for bleaching.

**Michigan.** Ongoing clinical studies:

<b>STUDY</b>	<b>DESCRIPTION</b>	<b>PI</b>
CEREC	Cusp replacement - Ceramic w/2 cements (high/low viscosity)	Fasbinder
CEREC	Cusp replacement - Composite w/2 cements	Peters
CEREC	Inlays w/porcelain vs composite, 1 cement	Fasbinder
PC	Point 4 vs Prodigy Cond	Dennison/Yaman
PRR	Diagnosis of P&F Caries and PRR (using AirAbrasion)	Hamilton
CLS	Cervical lesion study (adhesvie)	Peters
MI-Flow	PRR/sealant w/flowable composite resin and flowable compomer (using AirAbrasion)	Peters
Margin Reseal	Predictors of recurrent decay - clinical trial on repair techniques (NIDCR)	Dennison
PC	Experimental material w/new resin formula	Dennison/Yaman
Period h	Diabetes <-> Perio link (NIDCR)	Taylor
MI-GIC	PRR w/flowable composite resin and GIC	Peters

**Pitt.** No studies currently.

**CODE Question:**

For the future, CODE would like to consider a “paperless” directory. The directory would be accessible on our web site.

**Do you support an electronic directory?** Yes \_\_\_X\_\_\_ No \_\_\_\_\_

Comments:

There was unanimous support for this by the group.



## **Regional Agenda Items**

### **CODE Region IV - Regional Agenda**

#### **1. Competency versus requirements: Who uses what? Has it been successful? What metric is used? (NERB scores? Part II National Board scores?)**

**Michigan.** We have a 'vertically integrated clinic' system, and patient-centered care. Clinical curriculum is competency based and set up in Comp Care clinics. Specific requirements for graduation include acquiring 750 CEU's (Clinical Educational Units) based on procedure difficulty. Other requirements include passing a D3 operative competency exam (Class 3 or 4 composite and Class 2 amalgam) and D4 mock boards, a variety of restorative "independent projects", and specific endo requirements including one molar endo. Other disciplines also have competency requirements (oral med and perio) for graduation. D4s are also required to have 15 case completions. Patient procurement: After patients are screened with radiographs and a rough treatment plan, patient care coordinators (Staff) assign patients appropriately to match patients with students based on treatment needs and level of difficulty. We have one patient care coordinator for each of the four undergraduate student clinics. The student to which the patient is assigned is responsible for completing the treatment plan. Treatment plans are entered into a computer database. Patient care coordinators work with clinic directors to monitor patient care to ensure care is being delivered in an appropriate and timely fashion by both monitoring data in the computer and student interviews and patient record review on an ongoing basis. Each Comp Care clinic has 25 - 27 students assigned from each class (D1 - D4). Students are graded by their patient care coordinators on patient management skills which become part of their comp care clinic grade. If patients are reassigned to meet student needs, it must be approved by the patient care coordinator and patients are kept within the same clinic to maintain continuity with the coordinator and clinic director. For endo, there is a limited patient base which requires specific student assignments and referrals. This success of the system has not been measured by NERB results or National Board scores, to our knowledge. Our NERB results have improved over the last few years, but this is more likely due to increased time spent on mock boards and board review. Significant improvements (approximately 25% increase) in clinical productivity and revenue have been documented since this system was initiated and it has been assumed that if students are doing more procedures, their clinical experience will be better.

**CWRU.** We are currently in transition from requirements to competency. We actually use both patient based and requirements to be qualified for patient based program. Competency exams are required either on patients or typodont.

**Indiana.** We track by numbers of requirements. Students must have 15 completions to graduate.

Freshman are assigned to clinic from start to graduation.

**West Ontario.** Requirements are used in the 1<sup>st</sup> clinical year(3rd year). Competency tests given in 4<sup>th</sup> year in operative dentistry and endodontics. Must have 47-48 competencies to graduate. Other divisions only have a requirement for a certain number of procedures.

**University of Illinois-Chicago.** We recently have gone from requirements to competency based on quantity and quality of complete cases. Must have a certain number to be evaluated and the quality if evaluated by instructor. Board scores are used to evaluate didactic courses. We have a patient treatment unit (PTU) that manages the student's patients and we have seen that the student progresses better when they don't have to manage patients.

**WVU.** We've used the competency along with quantity. Competencies are evaluated by 2 faculty members in 7 basic areas. We have found that the NERB scores have improved 100%.

**OSU.** Competency exam is completed on a manikin in the 2<sup>nd</sup> year and must be passed in order to get into clinic. Students will have remediation if they fail two or more exams in the 3<sup>rd</sup> year competency exam given at the end of the third year. In the Senior year, competency is the Mock Board. A certain number of experiences are needed in each discipline. We do not track completed patients.

**2. National Board Results: does your school require the student to: Pass both parts prior to receiving a diploma? Pass Part I at a certain point in the curriculum? What do you do in the way of a board review to help the student prepare for the board?**

**Michigan.** National Board Results: Students not required to pass both parts prior to graduation or to pass Part I prior to continuing.

Board Review: Specific faculty provide informal board review sessions prior to Part II boards. These are optional attendance and usually done after normal school hours in the evenings (over pizza). Review sessions are provided for Oral Med, Perio, and Restorative. Review sessions essentially consist of review of old board questions. Also, since I have taken over as co-course director of our preclinical operative course, I have made an effort to review old board tests and emphasize those points in lectures.

**CWRU.** We require passing of both Part I and Part II to graduate, Part I must be taken with their class. We have an extensive Board Review course within the last several

years. It is incorporated into the curriculum in one semester for 16 weeks and includes a Mock Board test. The intent was that they had to pass the course before taking their boards.

**Indiana.** This is the first year to implement that you must pass both to graduate. Students must take Part I with their class. Each discipline is allowed one hour for a board review.

**West Ontario.** We have no board exams. Some choose to write the National Dental Examination Board (NDEB) to allow them to practice anywhere in Canada.

**University of Illinois-Chicago.** Students must pass Part I to enter clinic and must pass Part II to take the regional board exam. We have an extensive review which lasts 2 months for both parts. Students have 2 weeks of break before Boards.

**WVU.** Students must pass both parts to graduate starting with this year's senior class. We have an informal board review, one hour only, which is optional. We feel that we must have a better review.

**OSU.** Students must pass both Parts I and II to graduate. We are currently looking into a pass for diploma policy. We have Board review courses in the fall quarter before taking Part II.

#### CODE REGION IV ATTENDEES, October 2000

School	Name	Phone	Fax	Email
CWRU	T. Roma Jasinevicius	216-369-2237	216-368-3204	trj2@po.cwru.edu
CWRU	Ilze Bekeny	216-368-2486	216-368-3204	trj2@pr.cwru.edu
IU	Steve Dixon	317-278-1173	317-274-2419	sdixon@iupui.edu
IU	Ed DeSchepper	317-274-5331	317-274-2419	edeschep@iupui.edu
OSU	Janet Bolina	614-292-3316	614-292-9422	bolina.1@osu.edu
OSU	Peter Monaghan	614-292-0921	614-292-9422	monaghan.15@osu.edu
OSU	Bob Rashid	614-292-3071	614-292-9422	rashid.1@osu.edu
Pitt	Ton Brindock	412-648-1023		tnbl@pitt.edu

UIC	Jeremy Tu	312-355-0106	312-996-3535	sjtu@uic.edu
UM	Mery Ellen McLean	734-615-8353	734-936-1597	memclean@umich.edu
UM	Tilly Peters	734-763-3366	734-936-1597	mcpete@umich.edu
UWO	Bill Gray	519-661-2111 x86097	519-661-3416	wgray@julian.uwo.ca
WVU	Birgitta Brown	304-293-3860	304-293-2859	bkbrown@hsc.wvu.edu
WVU	Jack Yorty	304-293-5259	304-293-2859	jyorty@hsc.wvu.edu
WVU	Mark Richards	304-293-7101	304-293-2859	mrichards@hsc.wvu.edu
WVU	Elizabeth Kao	304-293-8730	304-293-2859	ekao@hsc.wvu.edu
WVU	Jim Foor	304-293-1245	304-293-2859	jfoor@hsc.wvu.edu
WVU	David Puderbaugh	304-293-2613	304-293-2859	dpuderbaugh@hsc.wvu.edu
WVU	Vernon Rodeffer	304-293-2611	304-293-2859	
WVU	Bill McCutcheon	304-293-1125	304-293-2859	Wmmccutcheon@hsc.wvu.edu
WVU	Ron House	304-293-1142	304-293-2859	rhouse@hsc.wvu.edu
WVU	Ted Stevens		304-293-2859	

## Enclosure #1 CODE REGIONAL MEETINGS REPORT FORM

**REGION:** V (Northeast)

**LOCATION AND DATE OF MEETING:**

Columbia University School of Dental and Oral Surgery  
October 19, 20, 2000

**CHAIRPERSON:**

**Name:** Dr. Richard Lictenthal  
**Address:** 603 W 168<sup>th</sup> Street  
Columbia University  
New York, NY 10032

**Phone #:** (212) 305 7069  
**Fax #:** (212)305-8493  
**E-mail address:** rm11@columbia.edu

**LIST OF ATTENDEES:** (including Phone #, Fax #, E-mail address - sample format attached)

See attached

**SUGGESTED AGENDA ITEMS FOR NEXT YEAR:**

Schools' experiences with various all-ceramic systems

What schools do with regard to mandating students do their own lab work on patient cases i.e., to what extent do students do work; should it be farmed out to labs?

Daily and clinical grading.

Resin bonded bridges vs. Maryland type bridges.

Is single full coverage restoration a Fixed or Operative procedure.

How broad is the scope of Operative dentistry in each school; does it include aesthetics/

**LOCATION/DATE OF NEXT YEAR'S MEETING:**

**Name:** Dr. Richard Lichtenthal

**Phone #:** (212) 305-7069

**Mailing Address:** 603 W 168<sup>th</sup> Street

**Fax #:** (212) 305-8493

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**E-mail address:** rm11@columbia.edu

New York, NY 10032

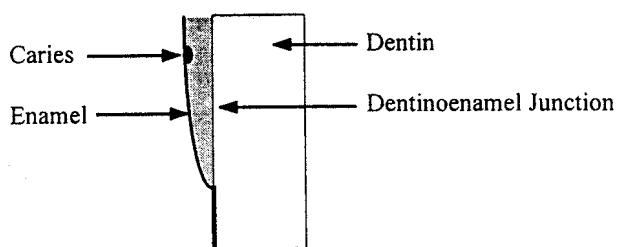
**Date:** TBA

Please return all completed enclosures to Dr. Larry D. Haisch, National Director, UNMC College of Dentistry;  
40<sup>th</sup> and Holdrege Streets; Lincoln, NE 68583-0750. Deadline for return: 30 Days post-meeting  
Office: 402 472-1290 Fax: 402 472-5290 E-mail: LHAISCH@UNMC.edu

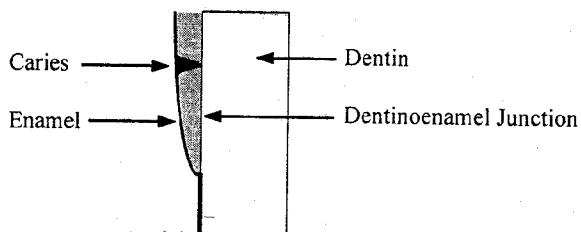
Also send the information on a disk or via e-mail with an attachment,  
indicating the software program and version utilized.

## 2000 NATIONAL CODE AGENDA

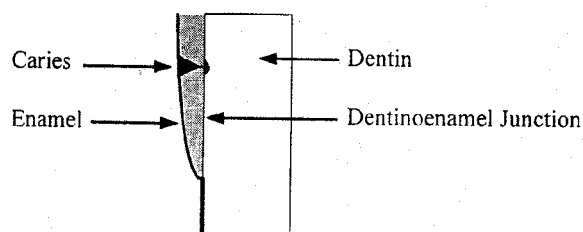
Answers are to be evidence based (please site) where appropriate.



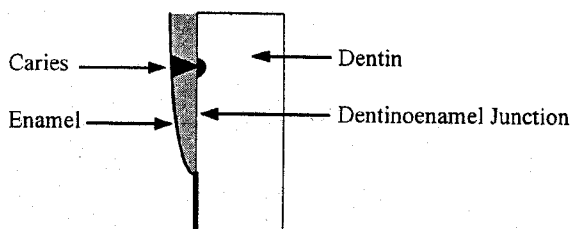
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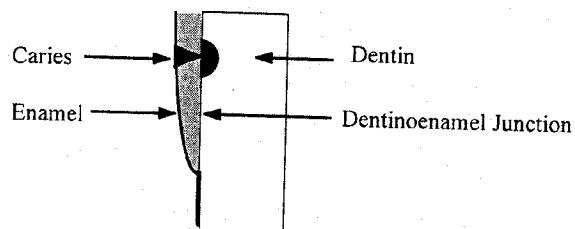
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From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:

## **2000 NATIONAL CODE AGENDA REGION V MINUTES**

Catherine Dunn of Ultradent gave an introduction about their company and discussion as to what makes Ultradent different:

- Focus on dental schools.

- Educators conferences in Utah.

- New dentist "boot camp":

  - Information to faculty.

  - 4<sup>th</sup> year dental students and faculty.

  - Dentists in specialized areas.

- Educational programs in schools:

  - Tooth whitening program.

  - Composites - Vitalessence.

  - Dentin bonding program:

    - Students bond extracted teeth.

    - Students get feedback as to their efficacy in bonding.

- Special packages for schools:

  - Unit dose kits that contain all materials.

  - Special kits can be set-up as needed.

- Inter-Guard: matrix for protection of adjacent teeth.

- Jiffy polishing system.

## 2000 NATIONAL CODE AGENDA

**Which diagram represents the point at which a preparation/restoration is indicated?**

Key: #1=E1, #2=E2, #3=D1, #4=D2, #5=D3

**NYU. #3**

**Boston.** #3; will intervene with #2 if poor oral hygiene evident or high caries risk;  
Slot preps may be used; with the right patient, #2 or #3 could be considered for remineralization, i.e. risk assessment definite factor

**Nebraska.** Struggling with cariology; becoming much more conservative

All schools attending appear to be in agreement that treatment would depend on risk assessment of a patient; #3 would be the diagram of choice to consider surgical intervention

- For conservative Class II lesions in premolars receiving a direct restoration, either amalgam or composites may be used by students
- For molars, it depends on the size of the lesion and the preparation; if good isolation with rubber dam cannot be attained, composite is not an option
- Gold inlays are no longer taught
- Gold onlays may be considered
- There is a greater patient desire for aesthetic restorations
- Comfort of the faculty with the procedure may be a factor
- The facio-lingual width of the preparation is a factor
  - up to 1/3 of the facio-lingual width of the tooth may receive a resin
  - anything greater should receive amalgam
- Some schools stated that posterior Class II composites are permitted in aesthetic situations only
- Some schools teach placement of glass ionomer on the gingival floor before placement of resin if the lesion extends onto the root of the tooth

**Are we headed in the right direction?**

**YES!** The more we cut a tooth, the more we weaken it. Although choice of restorative material may be selected at time of diagnosis, frequently altering that selection may be required at time of treatment due to factors listed above which may not be possible to predict at time of diagnosis.



Schools are not giving up the use of amalgam as quickly as private practitioners are. For those schools teaching slot preparations, if an occlusal pit is included, then the entire occlusal pattern is included in the preparation.

### **Protocol for low risk/hi risk patients.**

-Hi risk patients may require nutritional as well as preventive counseling; thus there is an attempt to move a patient from a hi risk individual to a lo risk

**Stony Brook.** all patients are assessed as to being hi or lo risk; if on recall visit they have 2-3 new lesions, they are categorized as hi risk.

-It is essential that compliance with regard to home care be documented on all patients.

-Lo risk recommendations should also be made with regard to oral hygiene instruction, number of snacks/day, periodic fluoride treatment, frequency of visits. Lo risk patients should not just be written off with no recommendations.

-Some schools have some form of a risk assessment program in place.

**Stony Brook, University of Conn. And University of Penn.** Do not

-In most schools, the percentage of patients who return for regular recalls is relatively low

**NYU.** has a caries-free for life program in its pediatric department and considering expanding that to its adult program; Once a patient's caries (if any) have been restored, if a patient comes for regular recall visits and follows prescribed home care and still develops new caries, those caries will be treated free of charge. The school charges an annual fee for participation.

### **Choice of Restorative Materials**

#### **Is there evidence of advantage for use of compomers?**

**U of P.** Glass ionomers are not used as a final restorative material – only as base or liner and then only in hi-risk patients; compomers are not used

**Howard.** In Class Vs, Dyract is used; Fuji glass ionomer may be used as a liner but not as a permanent restorative material as it has a lower modulus of elasticity and therefore greater flexibility so it may work better in an area of abfraction but there is no literature which documents this

**Stony Brook.** does not use them at all; Vitrabond is used as a liner; Ketac is used as a base but not as a core. Bases are no longer used to build up a large preparation to an “ideal”, classical form unless there is a real danger of condensing into the pulp

**NJ.** compomers are used for bases and liners; there is no evidence for using compomers instead of glass ionomer or composite as a final restoration. If anything, literature indicates there is no advantage other than less polymerization shrinkage.

**Temple and Boston.** neither use compomers; both use glass ionomers as liners and for root caries.

**NYU.** Dyract is used as the final restorative material in some Class Vs as determined only by faculty preference. As a liner or base, Ultradent's Ultraseal XT is used under both amalgam and composite.

### **Is there evidence for use of flowable composites?**

**McGill.** ease of use; they shrink more, wear more, but this is offset by resiliency and flexibility; they use to repair marginal defects

**Boston.** use in small Class Vs, small CI Is and on floors of Class IIs

**NYU.** use in Class Vs in lieu Dyract or as a liner/base

**NJ.** used as a liner/base under Class II composites only and for minor repairs of margins

**Stony Brook.** does use at all-they do not repair defective amalgam margins, only fully replace; for composite margin defects, they open up the defect and place additional composite if total replacement deemed unnecessary or impractical

**UConn.** small cavities and non-stress bearing areas; they like to use chemical-cure flowables in gingival half of the proximal box

**Howard.** uses them in proximal boxes covering the gingival floor and then fill the balance of the box with Sure-Fil.

**U of P.** uses them on the gingival floor of a proximal box and for repairs

The bottom line is that there appears to be no evidence as to how well these materials work. The general consensus is that the superior ability of these materials to adapt to cavity walls as opposed to standard composites probably results in decreased microleakage.

**Teaching guidelines and materials used for build up of cores if no endodontics has been done on a tooth**

**McGill.** Dyract; will use composite or amalgam if the crown cannot be done relatively soon

**Temple.** Amalgam with no pins or Ti-Core

**NYU.** if half of the tooth remains, composite is used; if less than half remains, tooth is devitalized and then a post and core is placed

**NJ.** amalgam

**Stony Brook.** amalgam; glass ionomer may be placed first to block out irregularities

**UConn.** amalgam in posterior teeth if 3 walls are present; composite or glass ionomer in non-stress bearing areas which are remote from margins of a crown being placed

**Columbia.** amalgam; will still place pins if it is a large build-up and the tooth is not going to receive a crown; pins are used as the main source of retention if less than ½ of the tooth remains

**Howard.** amalgam or composite used; glass ionomer may be used to block out undercuts

**U of P.** amalgam, composite or Ketac

**Is there evidence for cavity sealants (i.e. liners/bases) with amalgam restorations?**

**NYU.** we teach full etch followed by Ultradent's PQ1 under all restorations

**Boston.** Vitrabond is used only on dentin in deep preps

**Temple.** Vitrabond

**Do any schools take the type of amalgam alloy being used into consideration prior to restoration? e.g. spherical alloys v. non-spherical**

**Stony Brook.** No

**UConn.** No

**Columbia.** No

**Howard.** Teledyne varnish or Prime and Bond NT under everything

**U of P.** copal varnish under amalgam; Solo under composite, but not routinely placed

**Do sophisticated (pre-clinical lab) systems and technologies make a difference in students' clinical performance?**

**NYU.** no evidence; uses pole mount & head/mask only in first year sim lab; 2<sup>nd</sup> year performed in clinic with pole mounted head/mask

**Columbia.** same

**Boston.** uses Cavo Simulators; no information available at this time as they just started using this system in September, 2000.

**Temple.** in process of acquiring Dent-Sim and will incorporate into curriculum ASAP

**McGill.** uses head with pole

**NJ.** same as NYU/Columbia

**Stony Brook.** considering obtaining Cavo simulators; now use head/pole like NYU et al; Students are required to do 5 homework preps for each procedure but it is not possible to monitor if work being done in head or on benchtop

**UConn.** use pole and typodont with no head or mask

**Howard.** use head/mask on pole strictly in clinic setting, never in a lab

**U of P.** has 4 Dent Sim units; getting 2 more; they state they see no evidence to show clinical performance is any better on the part of those students trained on the simulator. They do believe that pre-clinical students advance and learn faster on their own with the Simulator and that fewer instructors are needed.

Therefore, there appears to be no evidence at this time to show superiority. Only certain students will benefit from the simulator's interactive experience. **U of P** believes

students using the Dent Sim need to perform fewer preps compared to pole/head to become competent.

With regard to use of fiber optics in the pre-clinical setting, only two schools have this capability. It helps students to see better, but there is no evidence to support whether these students do any better than those not using fiber optics.

### **Current utilization level of technology in the general curriculum.**

**McGill.** lecture notes are put on web site after transcription of a lecture is checked by the lecturer

**Temple.** web site is available but carries minimal information at this time

**Boston.** hi-tech systems are utilized in pre-clinical lab

**NYU.** none in clinics; construction is to begin shortly on new hi-tech pre-clinical simulation lab; web site is used for notes; Vital Source Technologies has been employed to put all required texts on a DVD – each student to be required to get a laptop. This will be in place in September, 2001.

**NJ.** Same as NYU; in pre-clinical lab, monitors are available at each student's station

**UConn.** Digital imaging is available for endodontic procedures in some clinics

**Howard.** Computer lab used for some exams; computer “smart class” lab is available to create presentations; some classes have their own web sites; digital radiography available in some areas

**Columbia.** Dent Sim, Difoti and web site

The consensus is that technology should be replace the academic environment and faculty/student relationship. It should only be an adjunct.

The question was posed as to whether CODE should use a paperless directory in the future. **Stony Brook** stated that it would not be opposed only if e-mail addresses were not included due to an already over-abundance of junk e-mail and the potential of this burden being increased if e-mail addresses were published in such a directory; the majority of those present were in favor of an electronic directory

## **Status of competency exams**

**NJ.** given in junior and senior years; 4 Class II amalgams and 3 Class IIIs; students must pass; In senior year, 2 exams are mock boards. In pre-clinic there are competencies. If student can't find a patient, they may perform on a manikin. If student fails a competency, they may take it a second time; if they fail it twice, they must take tutoring session. Repeated Fs may require repetition of an entire year

**UConn.** competencies are given in the 4<sup>th</sup> year; 4 exams: Class II amalgam or composite; Class III or IV; Class V and a caries-risk assessment/treatment plan. These exams are all given in a clinical setting and are all pass/fail.

**Stony Brook.** making efforts to not allow students to progress from third year to fourth year if they do not pass competencies. If necessary, they are held back from graduation. One or two students/year on average are not allowed to graduate. If they were accepted for a residency, their program is called and informed that they are being held back or potentially may be held back. Operative competency exams begin in September or October of 2<sup>nd</sup> year; They must do a Class I and V preparation and restoration on typodont. If certified, they may then see Operative patients. These exams follow very tough standards. If they don't pass, they cannot go into clinic. In April, they take a Class I competency on a patient. In 3<sup>rd</sup> year, all exams are on patients and are done during the first half of 3<sup>rd</sup> year so there is no competition with 4<sup>th</sup> year students for board patients. These exams must be repeated until passed. In 4<sup>th</sup> year, competencies are given on typodonts – Class IIs and IIIs, which must be absolutely perfect. Six additional exams: 3 composites on patients and 3 Class IIs. All must be passed or student will have to remediate at night. Students must then pass 2 clinical competencies exams in order to take the boards.

**Howard.** students take a pre-clinical competency at the end of their 2<sup>nd</sup> year. This is an all-day exam including a preparation, insertion, provisional restoration. Students must pass before seeing any patient. If they do not pass, they must perform a remedial project. In the 3<sup>rd</sup> year, this is a Class II and Class III manikin competency and a bridge. In the Spring of the 3<sup>rd</sup> year, Class III and V competencies are performed on patients using rubber dam. Exam includes caries recognition. Also, Class IIs and IIIs are done on manikins. Students take 3 mock board exams in their junior year and 2 in their senior year. They perform same procedures done on the actual board exam. Perio and endo procedure competencies are also given.

**McGill.** In pre-clinic, Class II, III and pin amalgam; 18 preparations are performed on extracted teeth. All exercises must be signed out; competencies must be repeated until passed. In the clinics, in second year a 2-surface competency is performed on a patient and in third year a 3-surface competency is performed.

**Temple.** Pre-clinically, practicals are given; nothing in second year; in third year, “x” amount of patients (number varies) are treated in order to go on to 4<sup>th</sup> year. In 4<sup>th</sup> year Class II and III competencies are performed on patients.

**Boston.** In the first two years, typodonts are treated as a patient including a given medical history. Practical must be passed or remediated. In third year, there are no numerical requirements. Every procedure gets a sheet filled out to track. The entire system is currently changing so information is not available. Practical and mock boards are given to 4<sup>th</sup> year students.

**NYU.** Endeavor to identify all problem students by end of the second year otherwise they are held back; if they do manage to get through the entire second year, they should be able to get through the entire curriculum.

In second year, 5 competencies are given on typodonts; all must be passed. If they fail a competency twice, they must get remediation before repeating again. No competencies are given in the third year. In the fourth year, competencies/mock boards are given including 3 Class IIs and 3 Class IIIs on patients plus an entire mock board on patients.

**Columbia.** daily requirements are monitored with no credit value

**Nebraska.** In third year, there is a Class II amalgam and Class III composite competencies are done on patients. These are pass/fail exams. If student gets an F, the course director must determine what the problem is and what if any remediation is required prior to re-testing. If student does not pass both competencies, they are given 8 weeks to pass otherwise they must repeat the entire year. The fourth year competency exams are given which mimic the central regional boards. There are 4 operative faculty members for 24 operative chairs. i.e. 1:6 faculty/student ratio. The third and fourth years are integrated. Nebraska has reverted back to discipline-based teaching from generalist teaching.

**Stony Brook.** Administers 3 hours/week course starting in September of 4<sup>th</sup> year in order to prepare students for the boards for the Class II procedure. A preparation course including a review of past questions and case presentations is given for Part II of the National boards. These have not improved their overall ranking – stand in the third quintile. Because students need to merely pass the boards and by the time they receive their scores, they’ve already been accepted to residency programs.

**Question posed by Temple:**

**Do you have separate pre-clinical and clinical faculty?**

**Howard.** Columbia, NYU, UConn: mixed i.e. share between the two

**Columbia.** has gone to generalist teaching with specialists readily available when necessary. However, all those generalists teaching multiple disciplines are full time faculty only. In addition, they are hiring 4 full time faculty per year for the next three years (starting 9/01) in addition to the 4 full time faculty hired this year in order to make generalist teaching work. As such, there will be 16 additional full time faculty for a total of 80 students.

**NJ.** generalist teaching in 3<sup>rd</sup> and 4<sup>th</sup> years

**Stony Brook.** 3<sup>rd</sup> year – teaching is discipline based; 4<sup>th</sup> year generalist based

**Are retention grooves taught in the proximal box of a Class II amalgam preparation?**

**NYU, Boston, NJ.** no

**Temple.** proximal grooves, but no gingival groove

**McGill.** proximal grooves with angled gingival seat

**Columbia.** facial, lingual and gingival retentive grooves

**Howard.** facial and lingual grooves used only if prep gets very wide F-L

**UConn.** same as Howard

**What liners and bases are taught to be placed under amalgams?**

**NYU.** Dycal when near exposure; etch and PQ1 under all

**Boston.** Vitrabond used only in deep preps

**Temple.** Dycal when deep plus Vitrabond

**McGill.** glass ionomer bases in deep preps, Dycal if very deep.

**UConn.** Dycal in very deep preps; glass ionomer placed under large resins



**NJ.** Dycal and base when necessary to bring back cavity for to “ideal” depths

There is probably no proof to justify the need for bases. It appears that most practitioners use what they feel comfortable with.

**With regard to the NERB, what changes would we like to see and how can CODE effect those changes?**

**NJ.** eliminate the patient portion of the exam

**NYU.** eliminate the patient portion to eliminate the subjectivity and lack of standardization; change the criteria for the provisional portion as the current criteria make attaining a high grade virtually impossible even for the best practitioner, bearing in mind that these acrylic provisionals are graded 6 weeks after the exam in Washington and at that point they have shrunk leaving open margins.

**Boston.** eliminate the physiological restoration

In addition, all agreed the endo portion should be altered to be realistic; the inability to take x-rays using the plastic teeth for the procedure proves nothing. Perhaps this portion could be performed on natural (extracted) teeth

### **Next year’s agenda – possible topics**

- schools’ experiences with various all-ceramic systems
- what schools do with regard to mandating student do their own lab work on patient cases i.e. to what extent to students do work; should it be farmed out to labs?
- daily and clinical grading
- resin bonded bridges vs. Maryland type bridges
- is a single full coverage restoration a Fixed or Operative procedure
- how broad is the scope of Operative dentistry in each school; does it include aesthetics?

It was agreed that it would probably be a good idea to have a meeting with a definite agenda at the Academy of Operative Dentistry meeting in Chicago this Spring. Schedule sometime before the actual meeting begins.

Next year’s meeting will again be held in New York, hosted by Columbia.



## CODE Region V Attendees

[illegible]

**Enclosure #1**  
**CODE REGIONAL MEETINGS REPORT FORM**

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**REGION:** VI (Southeast)

**LOCATION AND DATE OF MEETING:**

University of Alabama School of Dentistry  
Birmingham, Alabama  
October 25 – 27, 2000

**CHAIRPERSON:**

**Name:** Raquel Mazer, DMD, MS, MPH  
**Address:** UAB School of Dentistry  
1919 S 7<sup>th</sup> Avenue Box 82  
Birmingham, AL 35294-0007

**Phone:** (205) 934-1022  
**Fax #:** (205) 975-5874  
**E-Mail Address:** Rmazer@uab.edu

**LIST OF ATTENDEES:** (including Phone #, Fax #, E-mail address - sample format attached)

See attachment

**SUGGESTED AGENDA ITEMS FOR NEXT YEAR:**

See attachment

**LOCATION/DATE OF NEXT YEAR'S MEETING:**

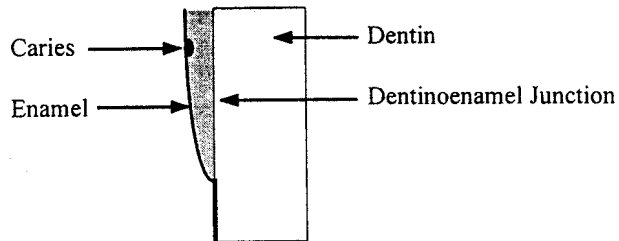
**Name:** Paul Osborne, DMD  
**Mailing Address:** UK College of Dentistry  
800 Rose Street  
Lexington, K 40536-0084

**Phone #:** (606) 257-2147  
**Fax #:** (606) 257-1847  
**E-Mail address:** pbosb02.pop.uky.edu  
**Date:** October, 2001

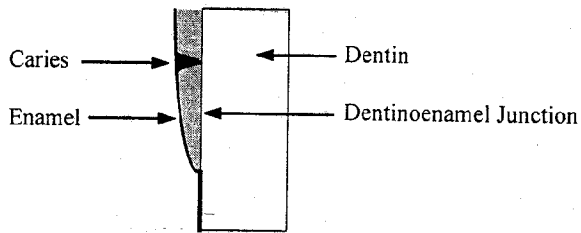
*Please return all completed enclosures to Dr. Larry D. Haisch, National Director, UNMC College of Dentistry;  
40<sup>th</sup> and Holdrege Streets; Lincoln, NE 68583-0750. Deadline for return: 30 Days post-meeting  
Office: 402 472-1290 Fax: 402 472-5290 E-mail: LHAISCH@UNMC.edu  
Also send the information on a disk or via e-mail with an attachment,  
indicating the software program and version utilized.*

## 2000 NATIONAL CODE AGENDA

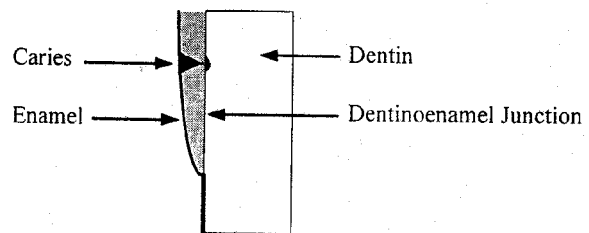
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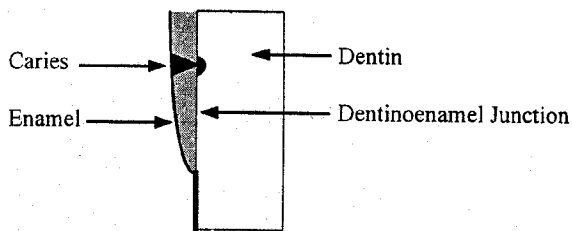
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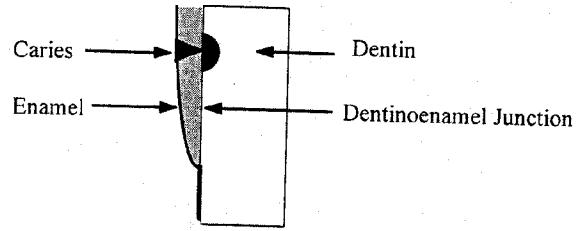
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3.



4.



5.

**From the five numbered diagrams of increasing radiographic caries depth, each school is to answer the following:**

**1. Which diagram represents the point at which a preparation/restoration is indicated?**

**AL. No. 3**

**FL. No. 3**

**MCG. No. 2**

**Kentucky. No. 3**

**Louisville. No. 4**

Mejare I; Sundberg H; Espelid I; Tveit B. Caries assessment and restorative treatment thresholds reported by Swedish dentists. *Acta Odontol Scand*, 57(3):149-54 1999 Jun

Mileman PA; van der Weele LT. The role of caries recognition: treatment decisions from bitewing radiographs. *Dentomaxillofac Radiol*, 25(5):228-33 1996 Nov

Lewis DW; Kay EJ; Main PA; Pharoah MG; Csima A. Dentists' stated restorative treatment thresholds and their restorative and caries depth decisions. *J Public Health Dent*, 56(4):176-81 1996 Summer

Lewis DW; Pharoah MJ; El-Mowafy O; Ross DG. Restorative certainty and varying perceptions of dental caries depth among dentists. *J Public Health Dent*, 57(4):243-5 1997 Fall

Weiss EI; Tzohar A; Kaffe I; Littner MM; Gelernter I; Eli I. Interpretation of bitewing radiographs. Part 2. Evaluation of the size of approximate lesions and need for treatment. *J Dent*, 24(6):385-8 1996 Nov

Woodward GL; Leake JL. The use of dental radiographs to estimate the probability of cavitation of carious interproximal lesions. Part I: Evidence from the literature. *J Can Dent Assoc*, 62(9):731-6 1996 Sep

Foster LV. Three year in vivo investigation to determine the progression of approximal primary carious lesions extending into dentine. *Br Dent J*, 185(7):353-7 1998 Oct 10

Powell LV. Caries prediction: a review of the literature. *Community Dent Oral Epidemiol*, 26(6):361-71 1998

Mount GJ; Hume WR A revised classification of carious lesions by site and size. *Quintessence Int*, 28(5):301-3 1997 May

Akpata ES; Farid MR; al-Saif K; Roberts EA. Cavitation at radiolucent areas on proximal surfaces of posterior teeth. *Caries Res*, 30(5):313-6 1996

**Meharry. No. 3**

**UNC. No. 2 or 3 probably, dependent on cavitation and caries risk factor.**

**NOVA. No. 3**

**MUSC. No. 3**

Pitts. *Clin Prev Dent*, 1984. No.2 – Waggoner, Crall. *Quintessence Int* 1984. Darling. 1959

**MCV. No. 2 or 3. Depending on pt.**

**2. Would the number change/remain the same for a patient of low caries risk?  
What is the evidence?**

**AL.** No. Poor prognosis of remineralization once the dentin is involved.

**FL.** No- "low caries risk" for us means no active lesions.

**MCG.** No. Diagram 2 indicates enamel caries involving DEJ. Such type of lesion typically has already penetrated the dentin (Silverstone L. M. *Pediatr Dent* 1982; 3 (Special Issue 2) 414-434) and success of remineralization is very limited. Even though a patient may be of low caries risk, at this time we'll prescribe treatment for caries lesion similar to Diagram 2.

**Kentucky.** Perhaps 4. However, the type of patients seen in our student clinics frequently are not reliable patients when it comes to recall and therefore delaying treatment may be risky.

**Louisville.** The number would change to No. 5, radiolucency extending into the outer 1/3 of the dentin.

Benn DK; Meltzer MI. Will modern caries management reduce restorations in dental practice? *J Am Coll Dent*, 63(3):39-44 1996 Fall

Lewis DW; Main PA. Ontario dentists' knowledge and beliefs about selected aspects of diagnosis, prevention and restorative dentistry. *J Can Dent Assoc*, 62(4):337-44 1996 Apr

Zero DT. Dental caries process. *Dent Clin North Am*, 43(4):635-64 1999 Oct

Ekstrand KR; Bruun G; Bruun M. Plaque and gingival status as indicators for caries progression on approximal surfaces. *Caries Res*, 32(1):41-5 1998

**Meharry.** The number would change.

Moss, ME Zero. DT (1995) An overview of caries risk assessment, and it's potential utility. *J Dent. Educat.* 59. 932-40. , *Art & Science of Operative Dentistry*, Sturdevant, 3<sup>rd</sup> Ed.

**UNC.** Without cavitation, remineralization efforts would be instituted.

**NOVA.** Change to # 4 —Sturdevant, 3<sup>rd</sup> ed. Pg. —93 R  
Remineralization/ arrested / lesions  
In some cases # 5 if isolated.

**MUSC.** Change. If patient had low caries risk due to age, diet, genetics, hygiene, all or some of the above. Lower incidence of caries progression and higher potential for remineralization would skew the number where a restoration is indicated toward the higher number. Reference: Anusavice and Mjor.

**MCV.** We may watch lesions the size of # 2 in a low risk patient if they have few risk factors. Would definitely fill #3, 4, & 5

**3. Would the number change/remain the same for a patient of high caries risk?  
What is the evidence?**

**What is your school's treatment protocol for patients of:**

- a) Low caries risk**
- b) High caries risk**

**AL.** We would most likely restore No. 2.

The screening is done at the treatment plan visit without any initial saliva tests, based only on plaque index, number of new and recurrent carious lesions (also gingival inflammation periodontal dz). We do not have a specific protocol for assessing caries level, however patients exhibiting numerous lesions will receive counseling and tests (upon their consent) in collaboration with the Dept. of Oral Biology.

- a) Proper OHI (brushing and flossing techniques) with recommendation for professional maintenance each 6 months.
- b) Proper OHI (brushing and flossing techniques) with the use of disclosing tablets or solutions at office visit and also recommending use for home care. Prescription of fluoride gels for brushing (while undergoing caries control) and fluoride trays.

**FL.** No.

- a) Hygiene-Routine Maintenance. "Low caries risk" for us means no active lesions or, in selected cases low Strep Mutans test result
- b) Hygiene – Fluoride Rinses Daily – Provisional Restorations for large retention sites-Definitive Restorations – chlorhexidine for 2 weeks without FI-Strep Mutans Test 3 months later-Maintenance

**MCG.** If the patient is of high caries risk, we might even consider restoring Diagram 1 type of lesion. Currently, we classify high risk patient by the following criteria:

- High Risk
- 2 or more lesions in past 3 years
- Large # filled surfaces/exposed roots
- Poor oral hygiene
- Irregular dental visits
- Elevated S. mutans levels
- Dietary risk factors
- Inadequate salivary flow rate
- Inadequate fluoride exposure

The treatment goals are to remove the infectious nidi from the patient's oral ecosystem and then attack the vulnerable microorganism.

Caries Risk Assessment taught at freshman level. Currently in dialogue with Oral Diagnosis Dept. as to how best to implement plan

- a) Annual recall, topical F once/year



b) High caries risk

Step 1. Restore existing carious lesions. Place caries-control temps. Dietary analysis. OHI.

Step 2. Apply sealant to unrestored teeth and to ditched/noncarious amalgam margins.

Step 3. Chlorhexidine rinses for 14 days. Fluoride varnish (Durafluor, Pharmascience, 207-4477, \$18.00/tube) or fluoride gel—three applications over one week. (New proposal at recent carious symposium is to use chlorhexidine rinse only once a week)

Step 4. Xylitol gum (Xylifresh, Henry Schein, (800) 851-0400, \$25.00 for 250-unit kit) – two pieces TID for at least five minutes.

Step 5. OTC fluoride rinses BID. Fluoride dentifrice two to three times per day. Consider fluoride trays. (Provident 5000 1X day)

Step 6. Recall exam for caries activity, compliance, and salivary tests.

Step 7. From salivary test results, re-institute antimicrobial therapy if necessary or continue with definitive restorations and strict recall.

**Kentucky.** Definitely 3 if high caries patient. There are a fair number of our patients from areas with unfluoridated water supplies.

a) Flossing instructions, dentifrice and recall at a minimum and then probably still treat caries if demonstrable at recall and into dentin.

b) Definitely restore definitive lesions, chlorhexidine rinses & fluoride trays. Would also increase frequency of recall as needed by individual patient.

**Louisville.** The number would change to 2.

a. Oral Hygiene Instruction (OHI):

Use disclosing tablets.

Show the patient the staining and explain the cause.

Explain and show proper brushing and flossing technique.

Reassess at next visit.

Reassess at approximately 3 month intervals.

Fluoride treatment every 6 months.

b. Oral Hygiene Instruction (OHI):

Use disclosing tablets. Show the patient the staining and explain the cause.

Explain and show proper brushing and flossing technique.

Reassess at next visit. Reassess at approximately 2 week intervals until acceptable plaque index is attained.

Fluoride treatment every 6 months. Diet analysis. Preident 5000.

**Meharry.** The number would remain the same for high caries risk patients. Massler, M (1967) Changing concepts in the treatment of carious lesions. Brit Dent J. 123. 547-8. Journal of Cariology, Abstract, Evaluation of Several Methods of Detection of Secondary Caries. M Ando. C Gonzalez et. al School Of Dentistry Indiana University

- a) 1. Caries risk assessment and plaque score calculations,  
2. Nutritional Assessment

3. Oral Health Education
  4. Observation with minimal intervention
  5. Re-Call assessment
- b)
1. Caries risk assessment and plaque score calculations
  2. Nutritional Assessment and Counseling
  3. Oral Health Education
  4. Aggressive Tx intervention
  5. Plaque Control Measures for Maintenance
  6. Frequently re-call assessments

**UNC.** With high-risk, restorative intervention would likely occur earlier, if numerous carious lesions already exist.

- a.) This is very complex, and the answer would be different depending on the patient's needs. Low-Caries patients would not receive topical chemical agents (fluoride, chlorhexidine) for caries-prevention, since they are not likely to need those.
- b) High caries risk patients would receive topical chemical agents (fluoride, chlorhexidine) for caries prevention and would be monitored more closely.

**NOVA.** Yes, base on risk assessment factors Studervant pg. 180.

- a) Exam, prophylaxis, X-rays re-check at 6mo. With explanation to patient.
- b) Exam, prophylaxis, X-ray restoration or lesion – OHI and 3 mo. Recall

**MUSC** The number might change toward a lower number. Same references as in #2. Would work with patient to try to remineralize #1.

- a) Continue to observe cases #1 and #2 for any signs of progression. Utilize fluorides to try to remineralize incipient lesions.
- b) Caries control. Patient education. Aggressive fluoride therapy and work with patient to try to manage the disease process.

**MCV.** Would fill # 2 on high risk pt, # 1 may or may not be filled depending on the patient.

- a) See attached sheet
- b) See attached sheet

**4. Indicate which drawing is minimally acceptable as a board lesion for the dental licensure board at your school/in your region. As several different board examinations may be given, please indicate the drawing and the respective examination.**

**AL.** Between 2 and 3. AL State Board.

**FL.** Diagram 1. Florida State Board.

**MCG.** Classification C2 – Enamel caries penetrating at least half way through enamel but not involving DEJ. In the Diagrams provided, it's somewhere between 1 and 2.

**Kentucky.** No. 3

**Louisville.** 1 for SRTA

**Meharry.** (2) SRTA into the D.E.J. (Radiographically)

**UNC.** No. 3. NC

**NOVA.** Florida - 2

**MUSC.** No. 3 - SRTA

**MCV.** SRTA – In the past it was always drawing # 2, but this past year they accepted # 1

**5. Previous CODE agendas have dealt with caries risk assessment. In addition much is heard about remineralization, minimum intervention, and the use of sealant.**

**How is all of this really affecting:**

- a) Decisions to treat:**
- b) Preparation designs:**
- c) Choice of restorative materials**

**AL.** a) Remineralization may be attempted with evidence of patient compliance (OHI, Prescription fluoride, etc), use of more conservative preparations if decision is made to treat (i.e., composite on enamel only).  
b) Students are taught case selection for PRR, small composite resins. The concept of extension for prevention is not a “must do”.  
c) More conservative preparations resulting in the use of composite resins as a substitute for amalgam when indicated.  
*\*\*\*Concern regarding the possible lack of communication between dental schools and state or regional boards. While we teach the students more conservative techniques on a daily basis, they may not be able to apply the concepts to the same extent when taking their state board examinations. Conflicting to the students. \*\*\**

**FL.** a) When clinically observable, surgically treat only cavitated lesions confined to enamel. Remineralize or seal non-cavitated enamel lesions.  
b) More conservative. More PRR's and Class II slot preps.  
c) Use more resin composite in areas of minimum intervention

**MCG.** a) As before, we are still placing lesions under "watch lesion" category. This is in line with our previous philosophy and no major changes took place.  
b) No change in amalgam preparation designs philosophy. We have just instituted competency requirements for composite restorations and the criteria for those restorations are in line with minimum intervention and preservation of tooth structure.

**Kentucky.** a.) More conservative Tx modalities such as remineralization, air abrasion, PRR and conservative restorations.  
b.) More conservative outline form, rounded internal line angles and increased use of resin restorative materials in approximately selected clinical cases.  
c.) More conservative composite resins.

**Louisville.** a) Clinically, the Operative faculty are allowing caries to progress to a greater depth than in the past. It is not unusual for them to place an "observe" indication on

\*\*\*\*\*

- a) Lesion previous treatment planned for restoration. The student may be told to "save that one for the boards."
- b) For the past several years we have been emphasizing and teaching proximal slot reparations in the preclinic course and not extending an occlusal preparation throughout the entire groove system if the enamel appears to be well coalesced.
- c) We are using more composite resin in slot preparations. The majority of Class V preparations are restored with resin- reinforced glass ionomer. In the posterior region, amalgam still remain the primary material for Class II restorations.

**Meharry.** How is all of this really affecting:  
a.) Less aggressive in our treatment.  
b.) Preparation designs smaller, a more conservative outline form.  
c.) More utilization of resins.

**UNC.** a) Less likely to automatically involve a restorative intervention  
b) Preparation designs: More conservative, more use of composites, sealants.  
c) Choice of restorative materials, more composites, sealants

**NOVA.** a) No answer.  
b) Minimal preparations especially with use of composite restorations  
c) For minimal risk – composite

**MUSC.** a) Increased use of sealants and minimum intervention dentistry. Some attention to remineralization, but not much.

- b) Increased preventive resin restorations and other conservative preparations for both composites and amalgams. Simonsen. Quintessence Int 1985.
- c) Increased use of composites in posterior occlusal areas, particularly where lesions are small. In non-occlusal areas, increased use of compomers and composites.

- MCV.**
- a) Watch incipient lesions in low risk patients & recommend FL exposure & good OH of area
  - b) No change in our prep design
  - c) Do more temp restorations in high risk patients until we can change their status. Amalgam still the choice for high-risk

## 6. What is the evidence for use of compomers? How are they being used in clinics?

**AL.** The students receive information on the materials at the didactic level. They are used very sparingly at the Restorative clinics. The properties of the ionomer and the composite resin are deteriorated by the combination (less F- release and decreased compressive strength and esthetics). They are utilized in the Pediatric clinics.

- FL.**
- a) Very. Little. Compomers essentially found to be weak composite resins which are stronger but less fluoride releasing than resin-modified and conventional glass ionomers.  
See; articles: JW Fan Dijken; A Peutzfeldt; RJ Smales ND Ruse; ES Duke; PF Abate, etc.
  - b) Do not use any compomers at this time.

- MCG.**
- a) Many aspects of the properties of compomer are reported to be inferior to composite and glass ionomer and yet the material is very popular especially in Europe mainly because of its ease of handling.
  - b) Not prescribed at this time.

- Kentucky.**
- a) We do not feel the evidence supports the use of compomers.
  - b) They are not utilized in our clinics.

**Louisville.** There is more evidence for not using compomers. The preparation has to be treated as though restoring with composite resin. Given that compomers release minimal amounts of fluoride, there is no advantage in using them over composite resin.

### Compomers References:

van Dijken JW; H(ørstedt P. Marginal adaptation to enamel of a polyacid-modified resin composite (compomer) and a resin-modified glass ionomer cement in vivo. Clin Oral Investig, 1(4):185-90 1997 Dec.

Andersson-Wenckert IE; Folkesson UH; van Dijken JW. Durability of a polyacid-modified composite resin (compomer) in primary molars. A multicenter study. Acta Odontol Scand, 55(4):255-60 1997 Aug.

Geurtsen W; Leyhausen G; Garcia-Godoy F. Effect of storage media on the fluoride release and surface microhardness of four polyacid-modified composite resins ("compomers"). Dent Mater, 15(3):196-201 1999 May.

Tyas MJ. Clinical evaluation of a polyacid-modified resin composite (compomer). Oper Dent, 23(2):77-80 1998 Mar-Apr.

Andersson-Wenckert IE; van Dijken JW; Hørstedt P. Interfacial adaptation of in vivo aged polyacid-modified resin composite (compomer) restorations in primary molars. A SEM evaluation. Clin Oral Investig, 2(4):184-90 1998 Dec.

Brackett WW; Gunnin TD; Gilpatrick RO; Browning WD. Microleakage of Class V compomer and light-cured glass ionomer restorations. J Prosthet Dent, 79(3):261-3 1998 Mar.

Prati C; Chersoni S; Cretti L; Montanari G. Retention and marginal adaptation of a compomer placed in non-stress-bearing areas used with the total-etch technique: a 3-year retrospective study. Clin Oral Investig, 2(4):168-73 1998 Dec.

Toledano M; Osorio E; Osorio R; Garcia-Godoy F. Microleakage of Class V resin-modified glass ionomer and compomer restorations. J Prosthet Dent, 81(5):610-5 1999 May.

Dietrich T; Lüscher AC; Lüscher GM; Roulet JF. Marginal adaptation of direct composite and sandwich restorations in Class II cavities with cervical margins in dentine. J Dent, 27(2):119-28 1999 Feb.

Sjödin L; Uusitalo M; van Dijken J. Resin modified glass ionomer cements. In vitro microleakage in direct class V and class II sandwich restorations. Swed Dent J, 20(3):77-86 1996.

b) at Univ. of Louisville they are not.

- Meharry.** a) Cavity sealing ability of compomer restorative materials. S.K. Sidhu and J.F. McCabe School of Dentistry – U of New Castle – UK. J of dental Research Vol. 79 Special Issue 2000.  
b) On some high-risk patients, compomers are used for caries control (efforts).
- UNC.** a) We recommend use for primary teeth or small Class I restorations, and sometimes as liner under a composite.  
b) Used in Pediatric Dentistry Clinic.
- NOVA.** a) Not used  
b) N/A
- MUSC.** a) High risk patients. Some fluoride release. Indicated for Class V restorations; not indicated for stress bearing restorations. (Lutz & Krejci: J Esthet Dent 2000) Positive information from Europe which was presented at a recent course in Charleston to be published in Supplement 6 of Operative Dentistry, hopefully in early Spring 2000.  
b) Sparingly in Class V situations, root caries, and some abfractions.
- MCV.** a) For use in primary teeth, blocking out undercuts on inlay/onlay preps, & class V restorations, because they are not very strong or esthetic.  
b) They are not routinely used in our clinics.

## 7. What is the evidence for use of flowable composites?

## How are they being used in clinics?

**AL.** Several in-vitro investigations in AL over the last years addressing the issue of margin adaptation and leakage. Our conclusions: flowable composites did not reduce leakage when used with a hybrid composite (CI I, II and V restorations). Flowables are only indicated as a liner prior to placement of composites when air abrasion is utilized for preparation.

### References:

**Mazer, R.B.** and Russell, R.R.: The use of flowable composite resin in ClassV restorations: Microleakage evaluation. J. Dent. Res. 77 (Spec. Issue A): 131, Abstr. No. 202, 1998.

R.R. Russell and **R. B. Mazer**: Conventional and air abrasion cavity preparation - margin adaptation of hybrid and flowable composites. J. Dent. Res. 79 (Spec. Issue): 354, Abstr. No. 1686, 2000.

Russell, R.R. and **Mazer, R.B.**: Microleakage of Class II restorations using a flowable composite as a liner J. Dent. Res. 77 (Spec. Issue A): 131, Abstr. No. 203, 1998.

R.R. Russell and **R. B. Mazer**: Should flowable composites be used as liners for Class II restorations? J. Dent. Res. 78 (Spec. Issue): 389, Abstr. No. 2266, 1999.

**FL.** a) Some. Flowables evidence higher (possibly stress-inducing) shrinkage than microfills, while evidencing similar low rigidity. Many flowables do not evidence clinically satisfactory radiopacity. See articles by SC Bayne; GL Uterbrink; MC Prager; R Labella; DF Murchison: etc.

b) At individual case/faculty discretion, as a thin liner for posterior Class II composite resin preparations.

**MCG.** a) The evidence on flowable and condensable is not conclusive yet. The idea of elastic bonding is popular in the lecture circuit.  
b) Not prescribed at this time.

**Kentucky.** a) There is weak evidence on the use of flowables  
b) They are not used in our restorative clinics.

**Louisville.** a.)We feel that they are inferior to composite resin (and resin-modified glass ionomers for Class restorations and extended bases in Class II restorations)

### Flowable Composite References:

Payne JH. The marginal seal of Class II restorations: flowable composite resin compared to injectable glass ionomer. J Clin Pediatr Dent, 23(2):123-30 1999 Winter .

Bayne SC; Thompson JY; Swift EJ Jr; Stamatiades P; Wilkerson M. A characterization of first-generation flowable composites. J Am Dent Assoc, 129(5):567-77 1998 May.

Labella R; Lambrechts P; Van Meerbeek B; Vanherle G. Polymerization shrinkage and elasticity of flowable composites and filled adhesives. Dent Mater, 15(2):128-37 1999 Mar.

b) They are not used by the Operative faculty. They are used in primary teeth in the Pediatric Dentistry clinic.

- Meharry.** a) K. Huber, J. Fischer, Simplified Bonding Systems and New Composites: Effect on Enamel Margins, U. Hospital, Germany.  
b) Presently not used in student clinic. However, samples have been used on selected cases
- UNC.** a) As sealants.  
b) Not used.
- NOVA.** a) Not used  
b) N/A
- MUSC.** a) Evidence for use as first increment in posterior composite restorations, for conservative preventive resin restorations, margin repairs. Easier coverage of preparation walls and some “cushion” effect due to its flexibility.  
b) First increment in posterior composites, small PRR’s, small repairs.
- MCV.** a) Class V restorations, small class I (PRR’s) blocking out undercuts, & lining gingival wall of class II.  
b) Restore preventive resin restorations line with floor of a deep resin preparation & to fill the floor of the proximal box in a class II resin preparation

## 8. What teaching guidelines and materials are used for build-ups?

**AL.** Build up restorations in amalgam and posterior composite resin. Cast post and cores are utilized for anterior and bicuspsids following EN therapy (if considerable tooth structure remains, will consider B/up instead of post. Some pre-fabricated post are used (not widely). Amalgams in molars, composite resin for some pre-molar cases and maxillary anterior. Molars receiving EN therapy are restored with chamber retained amalgam.

**FL.** Mostly amalgams (pins or chamber-retained). Infrequently, resin composite (e.g., porcelain crowns).

### **MCG.**

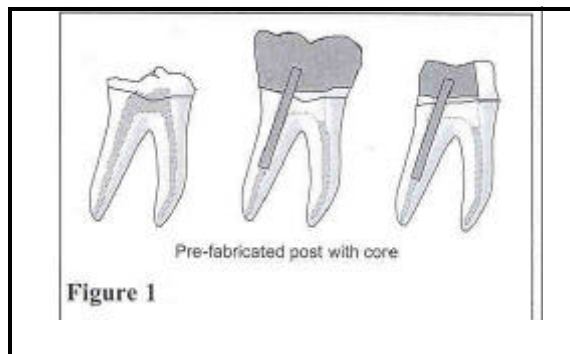
*The following are excerpts from a chapter written by our colleagues currently in press: The core build-up for a posterior tooth should be placed prior to crown preparation. A sufficient amount of time should have elapsed since completion of the root canal therapy to be confident that the root canal therapy has been successful. The tooth should be asymptomatic and not sensitive to percussion. Following root canal therapy, the typical molar will have a large existing restoration. All restorative materials and caries should be removed. The gutta percha should be removed from the pulp*



chamber. The gutta percha can be removed 1-2 mm into the canal orifices to increase retention (Figure 2). If there is at least one cusp remaining and the pulp chamber has walls of 2-3 mm in depth, a post is not required for retention of the core. The core may be either amalgam or composite resin (Table II)

The advantage of composite resin is that it may be prepared immediately. Composite resin also offers the advantage of dentin bonding and a relatively simple technique for core placement. The main disadvantage of composite resin is that it is subject to water absorption and micro-leakage. It should only be used in posterior applications when it is possible to place the crown margins at least two mm beyond (i.e. apical to) the resin-tooth interface. A composite resin core material of contrasting color should be used to minimize the risk of inadvertently preparing the preparation margin on composite resin. For an amalgam core, a metal matrix band or copper band can be used as a retainer. If the crown preparation needs to be completed the same day the core is placed, a fast-setting amalgam can be used. After 15 minutes, the core is hard enough to begin the crown preparation. The crown margin should be extended one mm apical to the amalgam-tooth interface.

For molars, if there is little remaining tooth structure or the pulp chamber is shallow, then a post should be used to provide retention for the core (Figure 3). Usually only one post is needed. A pre-fabricated post should be cemented into the largest canal. In mandibular molars this will typically be the distal canal. Do not attempt to place a post in the mesial canal of a mandibular molar as the distal wall of the mesial root is thin and very easily perforated. For maxillary molars, a single post in the lingual canal is adequate. Because the direction of the post is divergent from the pulp chamber, it creates excellent retention for the core.



**Table II. Core Materials**

	Indications	Advantages	Disadvantages
Conventional Glass Ionomers	Only for blockout of undercuts	Fluoride release	Low fracture toughness and strength Solubility
Resin modified glass ionomer	Partial core build-up with adequate tooth structure present	Fluoride release Moderate strength Tooth color	

Composite Resin	Core with pre-fabricated posts in anterior teeth	Tooth color Dentin bonding	Plastic deformation Absorbs moisture Dimensionally unstable
Amalgam	Cores for posterior teeth	Strength	Low early strength Metallic color
Cast metal	Cast post and core	Strength Core joined to post Bio-compatibility	Cost Metallic color

**Kentucky.** Use amalgam for build-ups utilizing threaded pins, slots, pots, grooves, box form, and amalgapins.. Model Shavell's work for anatomic contours and development of occlusion, Utilize cast post and cores in most bicuspids and anterior teeth...Shillingburg. Expose students to the use of prefabricated posts where appropriate...Williamson. Occasionally use glass ionomers ad block-out only.

**Louisville.** We generally use amalgam for core build-ups. Composite resin is sometimes used in restoring small areas of teeth to be used for crowns (e.g. a missing cusp). Resin-modified glass ionomer is sometimes used to block out undercuts.

**Cores.References:**

Sindel J; Frankenberger R; Kr(amer N; Petschelt A. Crack formation of all-ceramic crowns dependent on different core build-up and luting materials. J Dent, 27(3):175-81 1999 Mar.

Foley J; Saunders E; Saunders WP. Strength of core build-up materials in endodontically treated teeth. Am J Dent, 10(4):166-72 1997 Aug.

Dean JP; Jeansonne BG; Sarkar N. In vitro evaluation of a carbon fiber post. J Endod, 24(12):807-10 1998 Dec.

Cho GC; Kaneko LM; Donovan TE; White SN. Diametral and compressive strength of dental core materials. J Prosthet Dent, 82(3):272-6 1999 Sep.

Cohen BI; Pagnillo MK; Newman I; Musikant BL; Deutsch AS. Cyclic fatigue testing of five endodontic post designs supported by four core materials. J Prosthet Dent, 78(5):458-64 1997 Nov .

Moon MG; Jarrett TA; Morlen RA; Fallo GJ. The effect of various base/core materials on the setting of a polyvinyl siloxane impression material. J Prosthet Dent, 76(6):608-12 1996 Dec.

Schulte GA; Hermes CB; Vandewalle KS; Buikema DJ. Early fracture resistance of amalgapin-retained complex amalgam restorations. Oper Dent, 23(3):108-12 1998 Mar-Apr.

**Meharry.** Amalgam, Ti – Core & Fluorocore

**UNC.** Amalgam and composite and composite-core materials (primarily amalgam).

**NOVA.** Amalgam (bonded) and composite including Fluorocore – used when pupal involvement is not present and Fluorocore for post build-up.

**MUSC.** Varies depending on what the individual case requires. Molars: Amalgam is first choice, TiCore, CoreRestore, etc. is second choice if able to maintain 2 mm of sound tooth below core margin. May use pins in vital teeth. Amalcore buildup in non-vital teeth, possibly in combination with a post. Premolars: Pin amalgam for vital teeth, post and core for non-vital teeth. Post and core may be cast or fiber post with resin core (if 2 mm sound tooth below core margin).

**MCV.** Materials: amalgam or Fluorocore (immediate preps). Amalgam is to be used if crown is not going to be done right away.

## **9. What is the evidence for routine use of cavity sealants with amalgam restorations?**

### **What is the clinical usage?**

**AL.** It all depends on what side of the literature one wishes to read. The in-vitro information on hybridization of the dentin for use with amalgam or composite is more extensive than the clinical studies reported. Reduction on post-op sensitivity is related to the technique (bonded amalgam vs. hybridization only). Mahler (JADA, 01/2000) reports on the issue of sensitivity, margin integrity and tooth fracture for bonded and non-bonded amalgams.

At AL, an adhesive for hybridization may be used under the instructors OK and supervision. We do not encourage the use of bonded amalgams, although some of the clinicians may choose to recommend the technique. Concern relates to the lack of compatibility between a polymer and alloy (should not be called bonding) and the possible deterioration of the undersurface of the amalgam. A large cavity preparation should exhibit retention form independent of the use of adhesive.

**FL.** Equivocal: 1) reduction of post-op hypersensitivity questionable; 2) some evidence that separates from tooth structure within six months.  
Left to the discretion of the faculty member for each particular clinical situation.

**MCG.** In recent years, several investigators have advocated the use of resin adhesive systems under amalgam. (Dutton et al, Effect a resin lining and bonding on the marginal leakage of amalgam restorations. J Dent 1993; 21:52-56) The long term clinical implications of the use of dentin adhesive system under amalgams are still unknown.

Currently, we use Amalgambond plus (Parkell) mainly as adjunctive measure in addition to traditional resistance and retention features. It is not prescribed routinely as a cavity sealer.

In the case of rebonding, we do not teach routine use of cavity sealants after amalgam restorations. However if there are multiple caries lesions on the occlusal surface, we

might choose to restore the larger size ones with amalgam and seal the small lesions, especially those on the lingual groove area.

**Kentucky.** Not aware of current evidence supporting sealant's use but would be interested in reviewing some.

Occasionally use resin sealants to seal mild to moderately deteriorated marginal discrepancy is a seemingly serviceable restoration if clean margins can be obtained and assurance of no active decay.

#### **Louisville. Bonding of amalgam**

##### **References:**

van der Vyver PJ; de Wet FA; Kearney WD; de Nysschen D. Bonding of amalgam to dentine: microleakage and shear bond strength evaluation. J Dent Assoc S Afr, 51(8):531-5 1996 Aug.

Della Bona A; Summitt JB. The effect of amalgam bonding on resistance form of Class II amalgam restorations. Quintessence Int, 29(2):95-101 1998 Feb.

Setcos JC; Staninec M; Wilson NH. The development of resin-bonding for amalgam restorations. Br Dent J, 186(7):328-32 1999 Apr 10.

Staninec M; Marshall GW; Lowe A; Ruzickova T. Clinical research on bonded amalgam restorations. Part 2: Further studies and clinical technique. Gen Dent, 45(4):361-2 1997 Jul-Aug.

Browning WD; Johnson WW; Gregory PN. Postoperative pain following bonded amalgam restorations. Oper Dent, 22(2):66-71 1997 Mar-Apr.

Shimizu A; Hasegawa M; Kishimoto H; Yoshioka W. An in vitro investigation of the tooth strains associated with four different restorations in Class II cavity. J Prosthet Dent, 76(3):309-14 1996 Sep.

Ruzickova T; Staninec M; Marshall GW; Hutton JE. Bond strengths of the adhesive resin-amalgam interface. Am J Dent, 10(4):192-4 1997 Aug.

Meiers JC; Turner EW. Microleakage of dentin/amalgam alloy bonding agents: results after 1 year. Oper Dent, 23(1):30-5 1998 Jan-Feb.

Ausiello P; Davidson CL; Cascone P; DeGee AJ; Rengo S. Debonding of adhesively restored deep Class II MOD restorations after functional loading. Am J Dent, 12(2):84-8 1999 Apr.

Palmer AE; Davis RD; Murchison DF; Cohen RB. Fracture strength of Class 2 amalgams with various cavity-lining materials. Oper Dent, 24(1):45-50 1999 Jan-Feb.

Ausiello P; De Gee AJ; Rengo S; Davidson CL. Fracture resistance of endodontically-treated premolars adhesively restored. Am J Dent, 10(5):237-41 1997 Oct.

Sepetcioglu F; Ataman BA. Long-term monitoring of microleakage of cavity varnish and adhesive resin with amalgam. J Prosthet Dent, 79(2):136-9 1998 Feb.

We generally use a bonding agent under all amalgams for sealing of the dentin, not retention of the amalgam.

**Meharry.** University of Florida School of Dentistry evaluated 5 liners under amalgam with various cavity depths – Journal of Operative Dentistry Vol. 21 July-August 1996.

Routinely we use some form of Copal varnish and recently started to use NaFI varnish under amalgams. Bonding agents are used under all other materials.

**UNC.** We teach and use Gluma Desentizer under no-bond amalgams.  
Clinical use: Same as described.

**NOVA.** Not used routinely  
Copal varnish for deep restorations

**MUSC.** Fair amount of literature on resin “sealants” and some literature on Gluma Desensitizer. (Schupbach, Lutz, Finger Eur J Oral Sci 1997; Swift, Lloyd, Felton JADA 1997; Johnson, Lepe, Bales J Prosthet Dent 1998; Felton, Bergenholtz, Kanoy Int J Prosthodont 1991; Dondi dall’Orologio et al Am J Dent 1999.)

Routine use under all amalgam restorations.

**MCV.** Due to less corrosive amalgam material, need of a sealant to prevent microleakage around restoration.  
Use 3-step Scotchbond MP Plus to seal the dentinal tubules & the 5-step Scotchbond MP Plus to bond amalgam.

**Schools are utilizing various levels of simulation in pre-clinical labs. (Heads, torso, computer, Dent Sims, Etc., in comparison to “the pole and dentoform.”)**

**10. Do the sophisticated systems make a difference in the clinical performance?**

- a)
- b) To what degree, and what is the evidence?**
- c) Report on any controlled studies underway**

**AL.** a) There was some data prepared by Dr. Michael Belenky at the University of Maryland, that was presented at conference on clinical simulation in Seattle Washington in 1993.  
b) I am not aware of any publications showing this. Our renovation is predicated on the fact that the present outdated facilities need to better comply with OSHA standards. I feel that Dent –Sim and real sophisticated torsos are not needed. I do think that good A.V. Demos and support + equipment will enhance.

**FL.** a) Don’t know! Sim-Lab has only been in use for two years in our lab. No studies on this question accomplished.  
b) Don’t know  
c) None

**MCG.** a) We have found no major differences empirically. We have reported on some of the issues at last year's ADEA meeting (Ref. Below)

b) N/A

c) None

**Reference:**

Simulation with Preclinical Operative Dentistry courses - 3 year retrospective results

D.C.N. CHAN, K. FRAZIER & F.W. CAUGHMAN

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The Department of Oral Rehabilitation at the Medical College of Georgia developed and established a simulation laboratory for occlusion, operative dentistry and prosthodontics preclinical courses in Aug 1995. The system employed ADEC designed mannequins using Frasaco phantom head and torso, Kilgore study models and computer-supported audio-visual systems. Other schools have also started similar laboratories. The purpose of this retrospective study was to compare the pre and post-simulation performance in operative dentistry courses(1994-1998), and to share our experiences in simulation teaching. This time period was chosen because of the constancy of instructors. Student/faculty ratio improved from 13:1 to 11:1; the number of required procedures decreased from 38 to 32. The number of students achieving A performance significantly decreased from 22.7% to 4.5%. The B group increased from 55.7% to 63.4% while the C group increased from 20.2% to 31.1%. Other groups remain essentially the same: D: 0.98% vs. 0.3% F: 0.49% vs. 0.6%. The difficulty in achieving an A performance can be attributed to the more stringent requirement of the simulator. This may translate to better preparation for clinical conditions. The major problems encountered were 1) Student practice time was limited 2) Laboratory maintenance is expensive. 3) Development of curriculum and exercises to make full use of the facilities. The new simulation laboratory offers a lot of potential but requires continued funding and upkeep to function properly

**Kentucky.** a) At UK the use of clinical simulations in pre-clinic labs on the clinic floor with posts and head system yields anecdotal feedback from faculty covering student clinics that there is a high correlation of improved mirror use, ergonomics, and utilization of handpiece/water spray.

b) Cannot correlate the anecdotal remarks with measured degree of improvement. Study by Judy Buchanon at University of Pennsylvania appears to indicate no improvement.

c) None.

**Louisville.** a) For us, the first class to use the Simulation Clinic entered the clinics this summer so it is difficult to tell.

b) Our director of Operative tells me that she believes more of the Junior students are successfully challenging competency exams at an earlier time than in the past.

**Simulation.Reference:**

Fincham AG; Baehner R; Chai Y; Crowe DL; Fincham C; Iskander M; Landesman HM; Lee M; Luo W; Paine M; Pereira L; Moradian-Oldak J; Rosenblum A; Snead ML; Thompson P; Wuenschell C; Zeichner-David M; Shuler CF Problem-based learning at the University of Southern California School of Dentistry. J Dent Educ, 61(5):417-25 1997 May.

c) Any controlled studies underway: We have none.

**Meharry.** a) N/A – No simulation lab as of now. Planning to obtain 2-3 Dent Sim units in near future.

b) N/A

c) N/A

**UNC.** No. Torso and monitor since 1997. More convenient, questionable improvement in performance.

**NOVA.** a) Seem to allow student quicker development of indirect application of techniques. They develop use of mirror, hand-finger rests, etc. through the use of minikin heads in a true office simulation.  
b) Observation of pre/post usage over the years.  
c) None

**MUSC.** a) Don't know because we don't have them.  
b) N/A.  
c) N/A.

**MCV.** a) No high tech simulation lab at this time.

**11. Do the sophisticated systems decrease the amount of time necessary for students to make the transition from pre-clinic lab to clinic? By what amount, and what is the evidence? Report on any controlled studies underway.**

**AL.** Most of the evidence is empirical although there have been numerous oral presentations at AADS over the years inferring that this would be improved.

**FL.** Don't Know; Don't know. None.

**MCG.** Not from our experience, but no formal study was undertaken.; N/A; None

**Kentucky.** Do not use one of the 'sophisticated systems' but clinical simulation on the clinic floor with dentiforms on chair has evidenced improved student transition to clinic floor and actual patient care. By what amount, and what is the evidence?  
Unmeasurable. Anecdotal feedback from clinical faculty only. Controlled studies underway: None.

**Louisville.** Same as question 10.

**Meharry.** N/A. N/A. N/A.

**UNC** No.

**NOVA.** Yes – see 10A; Observation; No.

**MUSC.** N/A

**MCV.** No answer

**12. What is your school's current utilization level of technology? What is being used and how? (Interactive videos, course web sites, paperless, etc.) Is learning being improved and what is the evidence?**

**What clinical studies with direct or indirect restorative implications are being conducted at your school? Give a brief description.**

**AL.** We still use some traditional videos, but none interactive. Dental Anatomy course for the FR have all didactic material (slides, handouts, etc) in our web. Occlusion courses gradually transitioning to paperless (web). We have one hands-on exercise for fabrication of bleaching trays (cooperation between Operative and Prosth. Divisions) with instructions that are web-based. All of our renovated lecture rooms are set up with slide projectors, multi media projector and computer, Elmo projector and VCR. The school has one digital camera that can be checked out to the faculty as needed, two intra-oral cameras in the main student clinic for clinical use. We have some staff support for scanning and slide generation. We create our own presentations. Some studies on new composite formulations, f/up on BelleGlass study (5 yr results were published in JDR (abstract format).

**FL.** Video procedure demonstrations in Sim-Lab. Web site course schedules, info, notes, etc. No evidence yet regarding learning effects.

Two year clinical evaluation for Shofu of a new universal direct composite resin test named SP-266 to be marketed as "Beauti-fil".

**MCG.** The freshman Operative Dentistry Course RES 50001 has started utilizing WedCT format as of last year. The goals are shifting towards a paperless manual, uploading PowerPoint presentation files, PBL slide Quizzes, as well as grade posting. No interactive format or chat room is employed in Operative, but one of the advanced Perio courses is completely on line with weekly chat rooms under faculty supervision. Currently, we are working on a Surefil/Alert Study. We plan to restore 20 restorations of each, 10 of each with sealer (after restoration ) and 10 without. Each subject will receive one restoration. We will only accept 1<sup>st</sup> and 2<sup>nd</sup> molars with moderate to moderate-large in size. The pilot is well underway and we just had our first investigator feedback meeting.

### **Kentucky.**

1. Several courses available on the web.
2. Email to all students /faculty/admin.support individually and via list serves.
3. Courses that use interactive CD ROM.
4. Use by faculty of Powerpoint presentations with Proxima.
5. Scanning of clinical slides to digital format.
6. Digital intraoral camera on order

Currently there is an ongoing study of posterior composites with 5, 10, and 15 year recall already documented. Sample sized of 50+ teeth on approximately 20 individuals. Ongoing. Another study investigating water sorption on G.I.s.



**Louisville.** Several courses have lessons, outlines on the university server. The pre-clinic FPD course director has his entire course on a CD. More faculty are utilizing PowerPoint. We are in process of upgrading all lecture halls with LCD Data/video presentation projectors, digital document camera, digital annotating tablet, VCR, computer and monitor, internet access.  
We have no evidence of effects.

**Meharry.** Currently under consideration. Being discussed by Operative Department.

**UNC.** All course info is on a web site. Outcome is unknown. Electronic patient records in use.  
Bleaching studies, adhesion studies.

**NOVA.**

Comprehensive treatment planning on Web.  
Chelating agents as etching mediums.  
Comparing etched/non – etched bonding on microfractures and post-op sensitivity

**MUSC.** Computer presentations (minimal interactive). All students have e-mail and web access. We are working toward putting course outlines and “handouts” on the web. Classrooms have been upgraded to allow digital presentations and other audiovisual aids. No clinical studies with direct or indirect restorative implications, but some non-clinical studies

**MCV.** Class II Prodigy condensable 3 year study – clinical study with recalls over 3 years to evaluate wear, contact, margins, color, etc. Majority of several courses on the web.

**CODE QUESTION:**

**For the future, CODE would like to consider a “paperless” directory. The directory would be accessible on our web site.**

**Do you support an electronic directory? YES NO**

**Comments:**

**AL.** Yes

**FL.** Would save time, materials, postage, etc. Agenda should also be accessible on web site in a downloadable format which allows you to fill it out on your computer.

**MCG.** Yes

**Kentucky.** Yes. Great idea.

**Louisville.** Yes

**Meharry.** Yes. Most faculty have access to P.C. units, it is a good idea.

**UNC.** Yes

**NOVA.** Yes

**MUSC.** Yes

**MCV.** Yes

## **Regional CODE Agenda Items-**

**Expand on the discussions from last year relative to competency based dental education. The ADA has made it clear that they want us to move from requirements to clinical competencies.**

**1. What are the expectations of your dental graduates in restorative dentistry and how do you test for competency?**

**Are we testing for caries diagnosis, restorative treatment planning and sequencing, impression taking, provisional fabrication, etc. or just Class II amalgam procedures?**

**AL.** The D3 and D4 students are expected to produce a variety of procedures in Restorative Dentistry. Each procedure in OP is labeled and weighed with a certain number of points assigned to them. Students are expected to accomplish some procedures such as a number of CI II and CI III, complex amalgams per year. Any other OP related procedures carried out in our clinic will grant them points. The final grades are impacted both by the quality and quantity of work produced. . Each procedure that is part of the comprehensive treatment list of the patient is accounted for . There are patient-care coordinators to help with pt. assignment and to assure that pts are being scheduled for treatment. We have competencies in different areas (Operative, Prosth., Perio, Endo,) with the competencies in Restorative being graded by two faculty (always) . The students are assigned to Faculty members who provide supervision and assure the progress and sequence in the treatment (special attention to D3). Both D3 and D4 years are geared towards comprehensive treatment modalities, except for the level of supervision and the clinical settings (specialty clinics) being slightly different.

**FL.** We have separate restoration procedure menus( e.g., Resin Composite vs. Amalgam Class I's II's, V's, etc.) for the Sophomore - Senior Classes. Each student must accomplish a certain number per semester, each graded by two faculty.

**MCG.** At MCG we have a variety of clinical restorative competency procedures including Class I & II amalgam, Class II and III/IV composite Class II gold inlay, and Full/Partial Cast

Crown. We have introduced additional restorative-related competency procedures including rubber dam application, impression for a cast restoration and a provisional crown. Other competency procedures are under consideration.

**Kentucky.** We currently rely primarily on faculty feedback in the student clinics plus mock boards for senior students. Mock boards are modeled as closely as possible to Southern Regional Board Criterion. We are currently considering incorporating a daily faculty evaluation form used by UTSA as our daily faculty evaluation form, which is very thorough in it's addressing multiple aspects of clinical care as a guide to clinical evaluation....available on request.

**Louisville.** We expect them not to be dangerous.

In Operative, we have 5 competency exams in the Junior year (2 Class II amalgam restorations, 2 Class III composite resin restorations, and one of their choice). In the Senior year there are 6 competency exams (3 Class II amalgams, 2 Class III composite resins, and one of their choice). These exams make up the Operative course grades. In FPD, the competency exam consists of provisional restoration, crown preparation, and restoration.

**Meharry.** No answer

**UNC.** Requirement system based on point system. Points are earned for each operative procedure and are based on both quality (grade) and complexity of the procedure.

**NOVA.** Comprehensive patient care with various care levels necessary for graduation.

**MUSC.** Students must successfully complete three clinical competency exams (Class III composite, Class IV composite, and Class II amalgam) by the end of the Fall semester of their senior year. We are considering adding a competency exam for a Class II composite. Competency in caries diagnosis, restorative treatment planning, and other areas is evaluated daily in the Operative Clinic and weekly in senior treatment planning clinic.

**MCV.** CRA Competency (Caries Risk Assessment)  
Clinical procedure documentation (Intra oral camera)  
Operative comp – 4 + surface (core on RCT OK)  
Mock board-using x-rays  
Aesthetic Comp – Veneers, Diastema closure

## **2. Describe remediation for failed competencies. Especially, multiple failures.**

**AL.** D4 students may challenge a competency at any time from the beginning of the year. D3 are not allowed to do the same until they reach the second quarter in clinic. The student who fails has a chance to repeat the competency. If there are multiple failures, the

student is counseled, asked to do exercises on dentofom and show improvement (s/he is removed from clinic until proven competent to return).

**FL.** First, repeat the competency. If repeat unsuccessful, supervised mannequin exercise. In some cases, temporary suspension of operative clinic privileges.

**MCG.** Remediation for failed competency exams may involve a variety of forms ranging from simply retaking the exam to performing the specific procedure a few times in clinic in a non-test format prior to retesting to dentofom practice prior to retesting. Three failures of a competency exam usually results in having the student repeat the clinical course due to a failing grade.

**Kentucky.** Students are given the opportunity for remediation under the same conditions as the original preclinical examination. If a tutor is desired, we have an avenue to place the student being remediated with an appropriate tutor and practice sessions. Multiple failures are dealt with individually, but all must demonstrate clinical competency for a given procedure before receiving a passing grade for that course.

**Louisville.** The Course Director will outline an appropriate remediation plan. The plan is written and contains a specific number of experiences which the student must complete at a satisfactory level in order to again be eligible for another Competency Examination. A student cannot attempt another exam until given written approval by the Course Director. If a student fails two competency exams, the student's progress will be reviewed by the Course Director and the Operative faculty. Recommendations will be made, in writing, for remediation before attempting another competency examination. Failure of four competency examinations results in the failure of the course.

**Meharry.** No answer

**UNC.** 1-Dentofom exercises  
2-Assignment to full time Clinical faculty

**NOVA.** Repeat clinical experiences before next attempt. May require going back to typodont.

**MUSC.** Practice preparations on extracted teeth to be reviewed by faculty.  
One-on-one discussion of preparations with faculty.  
Additional practice exercises as required.  
Close faculty guidance on similar clinical case.

**MCV.** Grade of "O" Retake competency. Average of 2 grades.  
Failure of 2 graded clinical procedures = clinical suspension until remediation program completed

### **3. How much (%) do requirements count towards a student's clinical grade?**

**AL.** For D3 students, the expectations have a considerable weight. If they do not fulfill the minimum criteria to pass the course, they repeat it. We expect them to acquire enough experience by repetition and we have a good patient “bank”. We have contract grades for both years, and we expect them to succeed at different levels (some do well and some manage to be on the average)

**FL.** 50%

**MCG.** We have recently changed the percentages that requirements count toward the clinical grade. Seniors-50% Requirements 30 % competency. Juniors – 30% Requirements, 50% competency. The rest of the course grade is derived from faculty subjective evaluations.

**Kentucky.** We do not have clinical requirements. Students must demonstrate clinical competence.

**Louisville.** None

**Meharry.** No answer

**UNC.** None

**NOVA.** 75%

**MUSC.** A sliding scale is used based on expected minimum production in clinic. Grade penalties applied based on how much below the production minimum.

**MCV.** 50 % (35% Clinical Procedures). (15 % Emergency Service)

**4. Describe your Mock Board exercises. Days spent., procedures included, evaluation format, forms used, etc.**

**AL.** The exercises prepared for the students are presented by different disciplines in different format at different times during both D3 and D4 years. Clinic treatment (i.e. competency exam is based on State Board criteria for OP) some PBL cases presented in OP and Prosth.

**FL.** Fall/Junior Year: - day Dentoform Exercise (Amalgam Carving, Casting Prep, Endo Access)

Summer/Junior-Senior Year: - day (class II Amalgam on Patient, Abbreviated Dental Practice Act)

Winter/Senior Year: 3 days.

1<sup>st</sup> day (perio patient morning, Class II amalgam patient afternoon)

2<sup>nd</sup> day (Dentoform: Endo access and obturate, Class II and IV composite resin restoration, 3 unit bridge abutment preps, pin-amalgam restoration. )

3<sup>rd</sup> day (Prosthodontics station exam, Florida laws exam)

**MCG.** The Mock Board Exam is given two times and it includes three days. The procedures included are the same ones tested on the SRTA Exam. The format and the forms used are also designed to follow the SRTA Model.

**Kentucky.** As above, the Mock Board is modeled as closely as possible to the SRTA Examination and schedule. The Mock Board will consist of a jurisprudence examination (written) and clinical examinations in Periodontics, Restorative and Endodontic procedures. The Restorative section will consist of patient based procedures for the Class II amalgam and gold casting. Amalgams require at least one virgin surface of decay. Candidate may choose a patient based gold casting prep and restoration ranging from a Class II inlay to an MOD onlay to a full gold crown. Lab work may be performed by the candidate or by a commercial lab. The Endodontic section will utilize an extracted tooth (single or multi-rooted) mounted on an acrylic block. Complete access preparations will be evaluated and the candidate required to instrument and fill ONE canal. Density and final length will be evaluated with the post operative radiograph. The Prosthodontic section will be evaluated by a bench-type station exercise utilizing mounted casts and/or models. The Periodontal section (patient based) will consist of the successful removal of calculus from 4 teeth under local anesthesia.

The Mock Board is accomplished over a 2 1/2 day period to simulate the actual board examination and environment. Details of the scheduling, etc will be brought to the CODE mtg if further evaluation is desired.

**Louisville.** Number of days: 2

Operative: one Class II amalgam prep and restoration on a dentoform

FPD: inlay on dentoform

RPD & Denture: timed stations

Endo: fill

Perio: scale

Forms are same as those used by SRTA.

**Meharry.** No answer

**UNC.** Similar to South Carolina and Alabama.

**NOVA.** D-3 one mock board simulating board exam typodont section only

D-4 three mock boards simulating board exam typodont section only

Plans to include patient section

**MUSC.** See question #1. Each clinical competency exam is graded by two faculty. Student does all work independently (without faculty guidance, unless required to avoid a disaster) and is graded in similar fashion as the board would follow.

**MCV.**

NERB, SRTA and WERB – Board Practical on Manniquins for 1 day

Prep/Restore – CI II amalgam

Prep/ Impression/ Modelpour/Temp = full coverage

Evaluation 0,2,3,4, - Average both

**5. What non-rotary procedures (air abrasion, laser, etc.) are your predoctoral students performing? In the clinics? Do you have “requirements” or competencies, or is it elective?**

**AL.** We have one air abrasion device AirTouch (by Midwest) that may be used under close supervision, once the student has worked on tooth block with extracted teeth. Elective.

**FL.** None

**MCG.** At this time students are not required to perform non-rotary instrumentation and except for limited opportunities with air abrasion, there are no other procedures available.

**Kentucky.** Laser and air abrasion is available for predoctoral students on an elective basis to use under faculty supervision on selected cases.

**Louisville.** None

**Meharry.** No response

**UNC.** None

**NOVA.** None

**MUSC.** None at present.

**MCV.** Clinical Procedure Documentation

Use of Intra oral camera documentation of clinic procedure.

### **CODE REGION VI Suggested Agenda for 2001:**

1. CODE should consider formulating "Positive Statements" on various topics. Recommend to the Academy of Operative Dentistry to fund clinical research.

Rationale: Too many materials are created and introduced without adequate evidence such as compomers.

2. CODE should initiate a movement toward standardized board exams and principal-directed preparations. We are not taking advantage of well-constructed simulations for Board Exams. We need to continue to promote relationships with State and Regional Boards.

This year we had a representative of the Southern Regional Testing Agency present at our meeting. Sr. Darlene Sand Wall, a general dentist from Kentucky, participated in our discussions and offered opinions on board-related topics.

3. Web-based curricula topics to include demonstrating various school's web-based programs from the host school's meeting place.



## CODE Region VI Attendees 2000

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***END OF MANUAL***