FALL 2020 ROUNDS

EVIDENCE BASED DENTISTRY ROUNDS

BEHAVIORAL SCIENCES

2A-1

9/30/2020

ROUNDS TEAM

- **Group Leader: Dr. Pelz**
- **Specialty Leader: Dr. Shane**
- **Project Team Leader: Brett Barton**
- **D2: Kaory Gomez-Calzada & Garrett Jones**
- **D1: Ben Vilensky**

PATIENT

- 71 y.o. Caucasian female
- Chief Complaint: ”I need a cleaning and I would like a partial denture”
- Patient has an extensive history of gross decay resulting in multiple extractions
- Multiple notes in the patient’s chart on the need to improve oral hygiene to prevent spread of caries

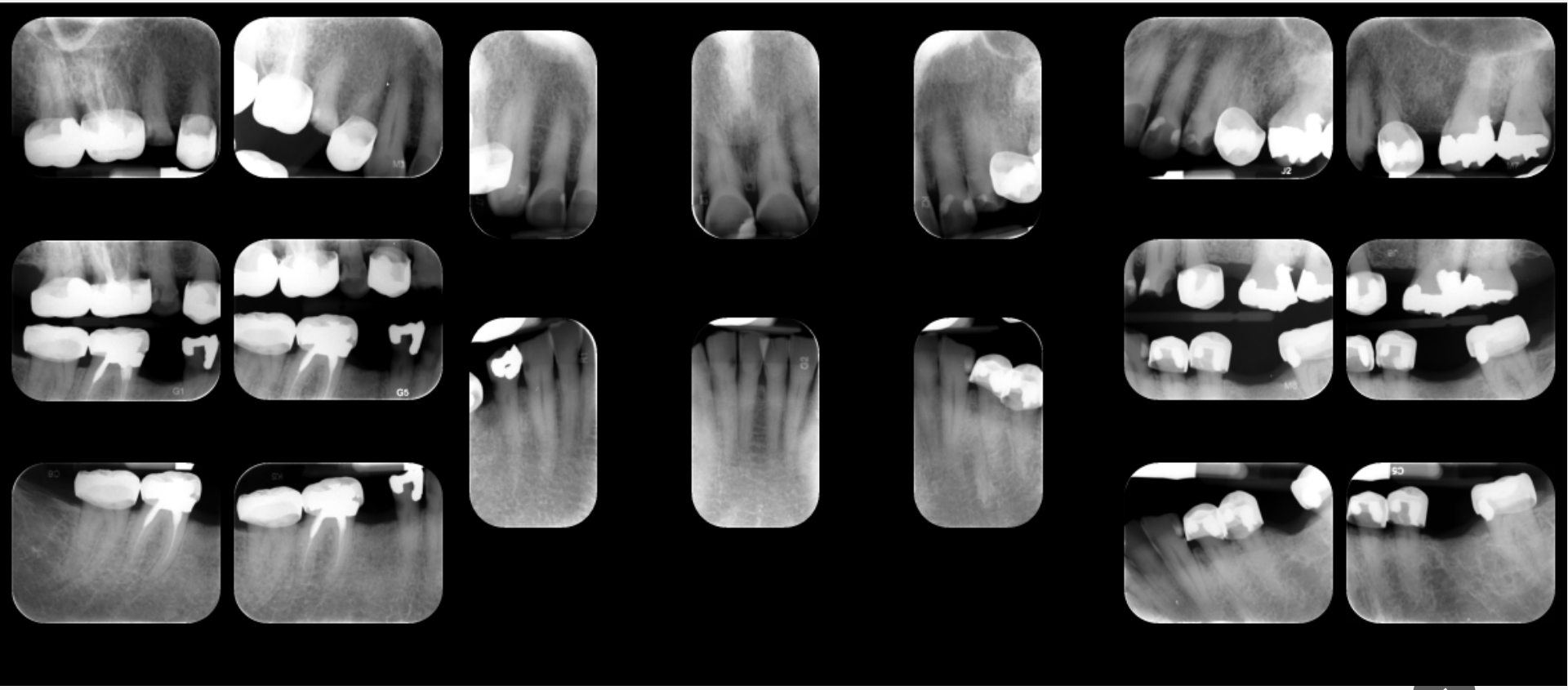
MEDICAL HISTORY

- Medications:
  - Trazadone (25 mg)
  - Aspirin (81 mg)
  - Atorvastatin (10 mg)
  - Buspirone (5 mg)
  - Famotidine (10 mg)
  - Olanzapine (5 mg)
  - Omeprazole (10 mg)
  - Oxybutin
  - Topiramate (25 mg)
  - Venlafaxine (25 mg)
  - Vitamin D
- Allergies:
  - Amoxicillin
- Medical Conditions:
  - Schizophrenia
  - Anxiety/Depression
  - Heartburn/Acid Reflux (GERD)
  - Osteoarthritis
  - Fibromyalgia
  - Hip replacement (date unknown) (pt. states no premedication required)
  - Knee replacement in 2016 (pt. states no premedication required)
  - Sinusitis
  - Bronchitis

DENTAL HISTORY

- History of gross decay leading to extraction of multiple teeth:
  - #2 ext – 4/23/2019
  - #3 ext – 4/23/2019
  - #4 ext – 4/23/2019
  - #5 ext – 4/23/2019
  - #11 ext – 1/3/2019
  - #12 ext – 5/6/2019
  - #18 ext – 5/6/2019
  - #20 ext – 5/6/2019
  - #21 ext – 5/6/2019
  - #28 ext – 6/3/2019
  - #30 ext – 6/3/2019
  - #31 ext – 6/3/2019
- Restorations on majority of surfaces of remaining dentition

RADIOGRAPHS



FMX taken on 9/13/2018

CLINICAL FINDINGS

- From Exam on 8/14/2020:
- #8 ML – recurrent caries
- #9 ML – recurrent caries
- #15 O – recurrent caries
- #22 ML – recurrent caries
- #23 DL – recurrent caries
- #24 F – recurrent caries
- #25 F – recurrent caries

PATIENT ODONTOGRAM

PERIODONTAL CHARTING

							1		1									MOBILITY
																		FURCA
					P P P	P P	P P	P P	P P	P P								PLAQUE
					B B	B B	B B	B B	B B	B B				B B				BOP
					7 7 7	7 7 7	7 7 7	7 7 7	6 6 6	7 7 7				5 5 5	5 5 5			MGJ
					4 3 3	4 2 3	4 2 3	4 2 4	5 2 4	4 2 4				2 4 6	7 3 3			CAL
					3 2 3	4 2 3	4 2 3	4 2 4	5 2 4	4 2 4				2 3 6	6 2 3			P.D.
					1 1 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0				0 1 0	1 1 0			FGM
1	2	3	4	5	6	7	8	9	10	11	12			14	15			
					1 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0								FGM
					3 2 3	3 2 3	3 2 2	3 2 2	2 2 4	4 2 2				3 3 5	5 3 3			P.D.
					4 2 3	3 2 3	3 2 2	3 2 2	2 2 4	4 2 2				4 4 6	5 3 3			CAL
																		MGJ
					B B	B B	B B B	B B	B B	B B				B	B			BOP
					P P P	P P P	P P	P P	P P	P P P				P P P	P P P			PLAQUE
																		FURCA
																		PROGNOSI

																		PROGNOSI
																		FURCA
					P P P	P P P	P P P	P P P	P P P	P P P								PLAQUE
					B B	B B B	B B B	B B B	B B B	B B B								BOP
					5 5 5	4 4 4	5 5 5	4 4 4	4 4 4	5 5 5								MGJ
					2 3 3	3 4 3	3 3 3	3 3 3	3 3 3	3 2 3								CAL
					2 2 3	3 2 3	3 2 3	3 2 3	3 2 3	3 2 2								P.D.
					0 1 0	0 2 0	0 1 0	0 1 0	0 1 0	0 0 1								FGM
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17			
					0 0 0	0 0 0	0 1 0	0 1 0	0 0 0	0 0 1								FGM
					3 2 3	3 2 3	3 2 3	3 2 2	3 2 3	3 2 2								P.D.
					3 2 3	3 2 3	3 3 3	3 3 2	3 2 3	3 2 3								CAL
					7 7 7	8 8 8	6 6 6	6 6 6	7 7 7	7 7 7								MGJ
					B B	B B	B B	B B	B B	B B								BOP
					P P P	P P P	P P P	P P P	P P P	P P P								PLAQUE
																		FURCA
						1	1		1	1								MOBILITY

PERIODONTAL DIAGNOSIS

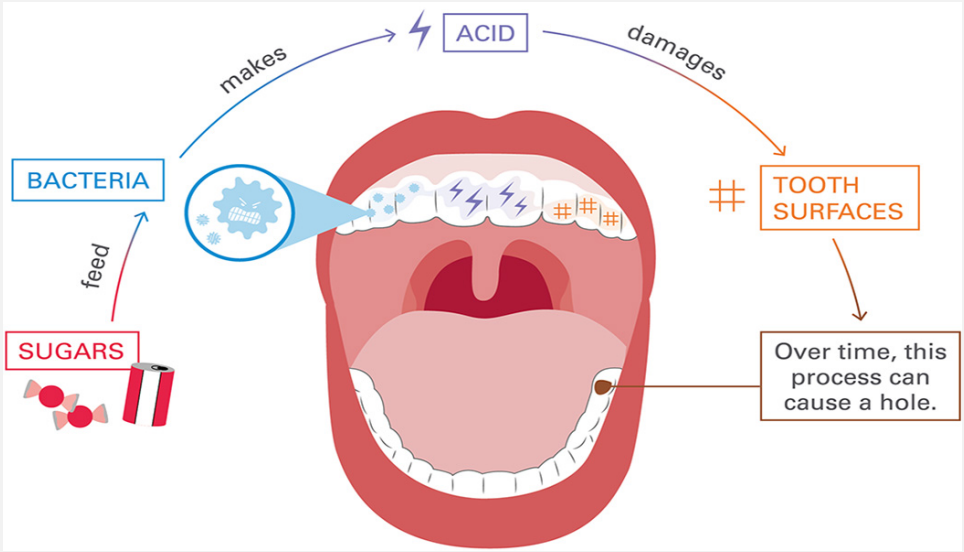
- Moderate Chronic Periodontitis

PROBLEM LIST

- Caries
- Missing Teeth

D1 BASIC SCIENCE QUESTION: WHAT IS THE ETIOLOGY OF THE DENTAL CARIES PROCESS?

- Microbial factors
  - Children acquire oral microorganisms, such as *Streptococcus mutans*, from their mothers in life
  - *S. mutans* is the primary causative microorganism in carious lesions (dental caries)
  - **Dental caries:** A microbial disease caused by a disproportion and increased pathogenicity of oral microorganisms, such as *S. mutans*, in response to environmental conditions
- Dietary factors
  - Increased intake in dietary sugars correlates strongly with an increased risk of dental caries
  - Certain oral microorganisms secrete acidic compounds as they digest sugars which can lead to acidification of dental plaque
- Host salivary factors
  - Hyposalivation is one of the strongest indicators of increased risk of dental caries
- Dynamic process
  - Periods of demineralization and remineralization

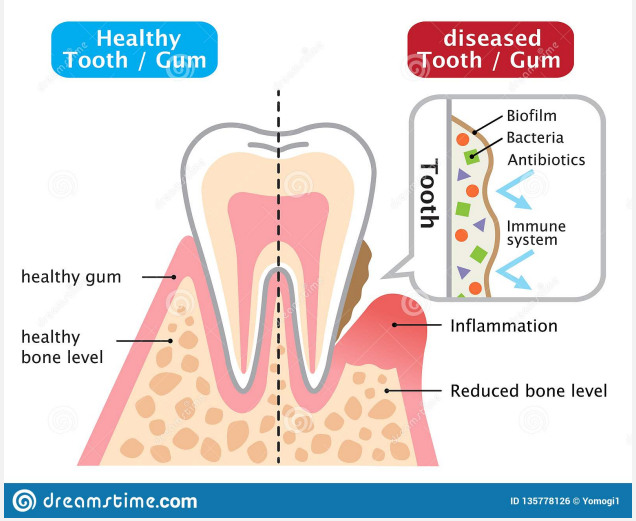


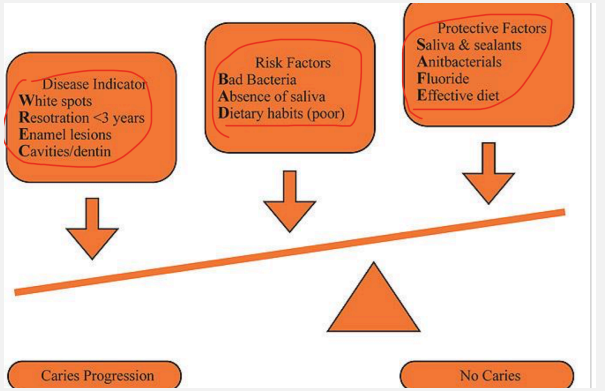
References

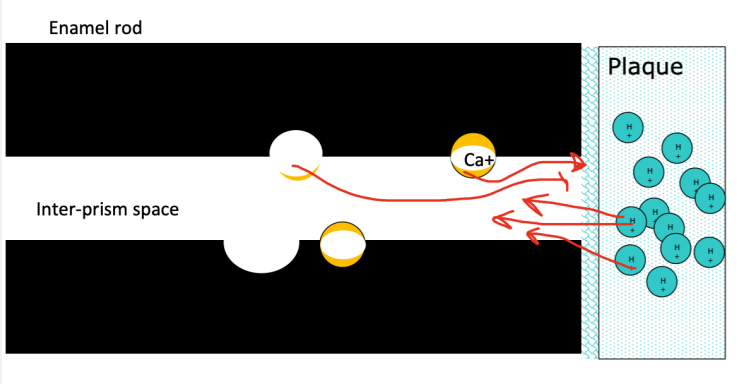
- https://doi.org/10.14219/jada.archive.2009.0355
- https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/tooth-decay-young-children

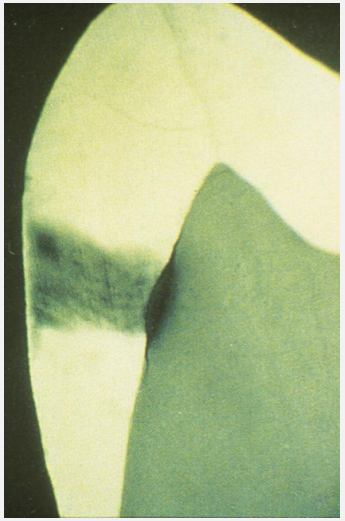
D2 PATHOLOGY QUESTION: HOW DOES ACCUMULATION OF PLAQUE AFFECT DENTAL CARIES PROGRESSION?

- Pellicle formation
- Early bacterial colonizers – S. mutans
- Late colonizers and acid producing bacteria – Lactobacillus
- Equilibrium Disruption
- Biofilm growth and maturation



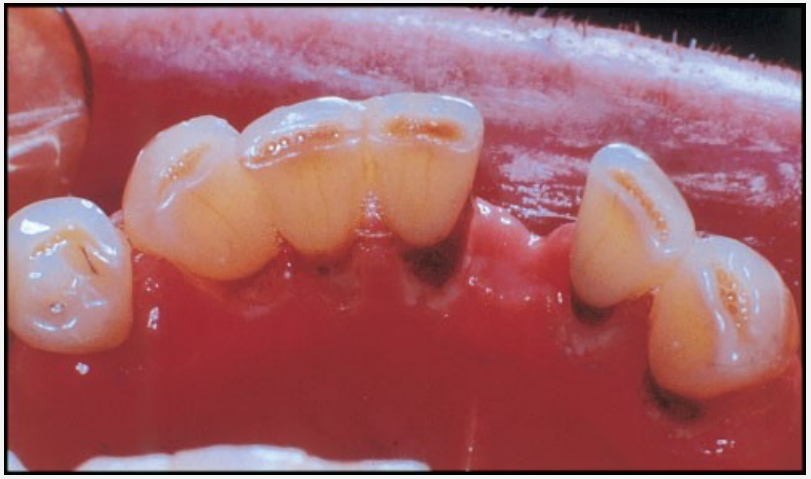






D2 PATHOLOGY QUESTION: IS THERE AN INCREASED RISK OF CARIES WHILE WEARING AN RPD?

RPDs:
-Replace one or more missing teeth and may have clasps that wrap around healthy 'abutment' teeth.
-Clasps may be made of acrylic or metal



Disadvantages of RPDs:

-The clasps that wrap around healthy abutment teeth can increase the build up of plaque.

-The plaque can cause caries

-There is an increase of Strep. Mutans in RPD wearers

What can the provider do to intervene?
-Motivate patient to maintain good oral hygiene
-Give verbal and written oral hygiene instructions
-See patient regularly for recalls

D3 PICO

Clinical Question:

How does patient noncompliance with oral hygiene affect treatment of partial edentulism?

PICO FORMAT

P: Patients seeking dental treatment

I: Noncompliance with oral hygiene instruction

C: Compliance with oral hygiene instruction

O: Treatment options

PICO FORMATTED QUESTION

- For patients seeking dental treatment, how does noncompliance with oral hygiene instruction, compared to compliance with oral hygiene instruction, affect treatment options?

CLINICAL BOTTOM LINE

- Research suggests that noncompliance with oral hygiene (such as frequency of toothbrushing) may increase the risk of caries compared to those who more frequently practice oral hygiene.
- It is also shown in the research that patients who wear an RPD are at a higher risk of caries than those who do not wear an RPD.

SEARCH BACKGROUND

- **Date(s) of Search: 9/2/2020 and 9/3/2020**
- **Database(s) Used: PubMed**
- **Search Strategy:** Association of caries with oral hygiene compliance
- **Keywords: compliance, caries, removable partial denture, oral hygiene**

SEARCH BACKGROUND

- **MESH terms used for Article 1:**
  - **Caries, toothbrushing, compliance**
- **MESH terms used for Article 2:**
  - **Caries, removable partial denture**

ARTICLE 1 CITATION, INTRODUCTION

- **Kumar S, Tadakamadla J, Johnson NW**

"Effect of Toothbrushing Frequency on Incidence and Increment of Dental Caries: A Systematic Review and Meta-Analysis". J Dent Res. 2016;95(11):1230-1236. doi:10.1177/0022034516655315

- Study Design: Systematic Review and Meta-Analysis

ARTICLE 1 SYNOPSIS

- Aim: To determine how frequency of toothbrushing affects incidence and increment of caries
- Studies Selection: Related to oral hygiene behavior and based on study design, sample size, dental caries outcome and diagnostic criteria. Case-control, prospective cohort, retrospective cohort, and experimental trials that evaluated the effect of toothbrushing frequency on the incidence or increment of new carious lesions were considered for inclusion.
- Studies Review: 5,494 articles retrieved, 74 reviewed in full, 33 eligible for review (25 eligible for quantitative synthesis)
- Follow up periods ranged from 11 months to 15 years

* Majority of studies diagnosed a carious lesion once it was cavitated

ARTICLE 1 SYNOPSIS

- Meta-analysis was conducted based on caries outcome reported in the reviewed studies (incidence and increment)
- Results:
  - Incidence: The study found that infrequent brushers, compared to frequent brushers, demonstrated a higher incidence of carious lesions (OR 1.50; 95% confidence interval [CI]: 1.34, 1.69).
  - Increment: When evaluating increment of carious lesions, brushing <2 times/day significantly caused an increment of carious lesions compared with >2 times/day brushing (standardized mean difference [SMD] 0.34; 95% CI: 0.18 to 0.49).
- Conclusion:
  - Overall, the study found that individuals who state that they brush their teeth infrequently are at greater risk for the incidence or increment of new carious lesions than those brushing more frequently.

ARTICLE 1 SELECTION

- This article was selected due to the relevance to the case and relation to the clinical and PICO questions

ARTICLE 2 CITATION, INTRODUCTION

- Citation: **Jepson NJ, Moynihan PJ, Kelly PJ, Watson GW, Thomason JM.**

"Caries incidence following restoration of shortened lower dental arches in a randomized controlled trial". Br Dent J. 2001;191(3):140-144. doi:10.1038/sj.bdj.4801122

- Study Design: Randomized Controlled Trial (RCT)

ARTICLE 2 SYNOPSIS

- Aim: To determine the caries incidence of a conventional removable partial denture vs bilateral cantilever resin-bonded bridges (RBBs) when restoring a shortened lower dental arch.
- Study Population: 25 males and 35 females with a median age of 67.
- Method: The patients were randomly placed in a denture treatment group and a bridge treatment group with 30 patients in each group. Exams were completed at 3 months, 1 year, and 2 years after prosthesis insertion.

ARTICLE 2 SYNOPSIS

- Results:
  - For the bridge group, with the 165 remaining natural teeth, there were 11 new carious lesions and 1 tooth fracture after 2 years. For the denture group, with the 156 remaining natural teeth, there were 51 new or recurrent carious lesions and 3 tooth fractures.
  - The difference between the 2 groups was found to be highly significant ($P < 0.01$)
  - When looking at which teeth the caries were found on, there was a 14% incidence on non-abutment teeth and 9% incidence on abutment teeth for the bridge group. For the denture group, there was a caries incidence of 14% for non-abutment teeth and 60% incidence for abutment teeth.
- Conclusion:
  - When restoring a shortened lower dental arch, compared to a resin-bonded bridge, wearing an RPD has a significantly greater incidence of new and recurrent caries

ARTICLE 2 SELECTION

- This article was selected due to the relevance to the case and relation to the clinical and PICO questions

LEVELS OF EVIDENCE

- [x] **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
- [x] **1b** – Individual RCT
- [ ] **2a** – Systematic Review of Cohort Studies
- [ ] **2b** – Individual Cohort Study
- [ ] **3** – Cross-sectional Studies, Ecologic Studies, "Outcomes" Research
- [ ] **4a** – Systematic Review of Case Control Studies
- [ ] **4b** – Individual Case Control Study
- [ ] **5** – Case Series, Case Reports
- [ ] **6** – Expert Opinion without explicit critical appraisal, Narrative Review
- [ ] **7** – Animal Research
- [ ] **8** – In Vitro Research

STRENGTH OF RECOMMENDATION TAXONOMY (SORT)

☒	**A** – Consistent, good quality patient oriented evidence
☐	**B** – Inconsistent or limited quality patient oriented evidence
☐	**C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

CONCLUSIONS: D3

- The evidence shows that patients who are noncompliant with oral hygiene (toothbrushing) are at a higher risk of carious lesions compared to those who more frequently practice oral hygiene.
- Patients who wear an RPD also appear to be at a higher risk of caries compared to those who do not wear an RPD.
- Based on this evidence, for a patient who is non-compliant with oral hygiene, an RPD would not be indicated as a definitive treatment option to replace edentulous areas as noncompliance with oral hygiene as well as the RPD would greatly increase the risk of caries to the remaining dentition.
- Managing noncompliance with oral hygiene should be a priority for the practitioner.

CONCLUSIONS: D4

- Based on the evidence, for this case, it would be advised to recommend restorations for all carious surfaces and to reinforce oral hygiene instruction and education, as well as utilizing motivational interviewing for oral hygiene compliance.
- Compliance with oral hygiene is necessary before an RPD can be considered to treat the patient's partial edentulism.
- Due to financial constraints, the patient will have difficulty affording the restorations, and alternative treatment for carious lesions, such as placement of SDF or eventual complete denture, may be necessary in the future.

THANK YOU