Oral health literacy in a low socioeconomic class

Evidence Based Dentistry Rounds

Dental Public Health

5B-2

October 7, 2020

Rounds Team

- Group Leader: Dr. Dix
- Specialty Leader: Dr. Bhagavatula
- Project Team Leader: Nadia Hatoum
- Project Team Participants:
  - D1: Matthew Kettering
  - D2: Nikhila Alsakani
  - D3: Lukas Schwartz

Patient

- Age: 38
- Gender: Female
- Ethnicity: Caucasian
- Chief Complaint: "I need to be able to chew"
- Patient indicated she knows her teeth are bad and wanted to replace her entire dentition with implants. The patient had a strong disdain for any sort of removable appliance and indicated due to her younger age, she should not be wearing dentures.

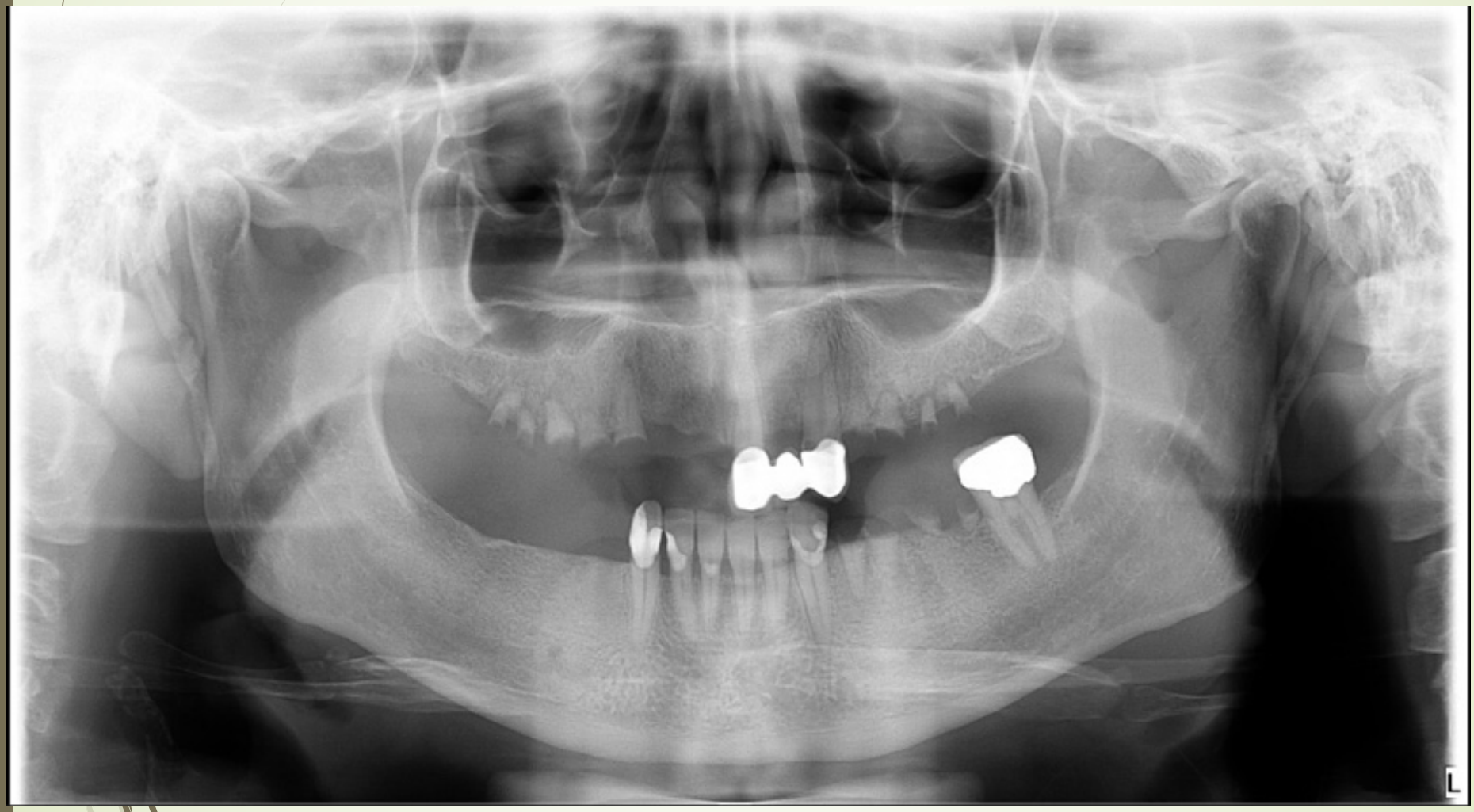
Medical History

- Medications
  - Carisoprodol
  - Adderal (not taking anymore)
- Allergies
  - Penicillin
- Medical History:
  - Past smoker, current vaper (2 cartridges a day)
  - History of cervical cancer in 2002
  - Headaches and migraines
  - ADD/ADHD
  - History of ulcers
  - History of gallbladder stones

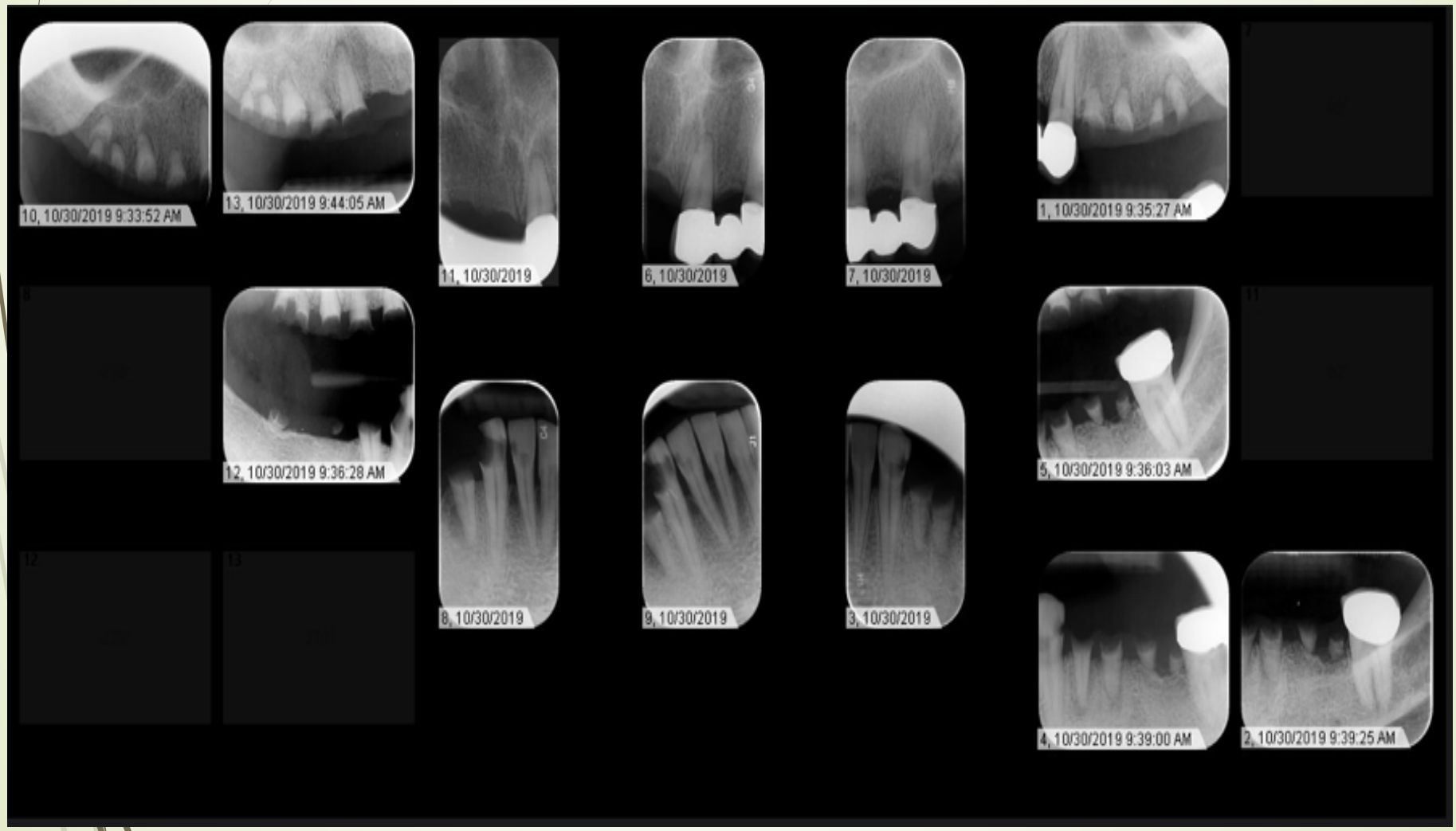
Dental History

- Dental procedures:
  - Extractions
  - Root Canal Therapy
  - Flipper
  - Bridges
- Dental Problems:
  - Dental pain
  - Sensitivity to sweets and pressure
  - Trouble chewing
  - Headaches
  - Gross decay
  - Primary caries
  - Unhappiness with appearance of teeth and smile

Radiographs (Pan)



Radiographs (FMX)



Radiographic Findings

- Generalized gross decay
- Missing teeth
- Retained root tips

- Radiographic bone height from CEJ:
  - Upper right: no teeth
  - Upper anterior: > 4 mm
  - Upper left: no teeth
  - Lower right: 2-4 mm
  - Lower anterior: > 4 mm
  - Lower left: no teeth

Clinical Findings

- Gross Decay: 3, 4, 5, 6, 12, 13, 14, 19, 20, 21, 22, 27, 28, 29, 30
- Primary Caries: 26 DF, 25 F
- Recurrent Caries: 11 M
- Current restorations: FPD 9-11, ACC 18
- Endo treated teeth: #30

- Functional Eval:
  - Overbite: 5mm
  - Overjet: 2mm
- Soft Tissue:
  - WNL

Specific Findings

11/21/19	N. Hatoum	Note	J. Kamows	Last Modified: 11/21/19

Patient presents for prophy and treatment planning presentation

RMHx: no changes
BP: 103/77 HR: 103

Discussed with patient her proposed stage 1 treatment plan. Discussed the risks of doing nothing and the benefits of proceeding. Answered any of patients' questions and patient signed consent form for treatment plan. Disclosed and performed OHI. Discussed brushing and flossing. Patient doesn't brush very often anymore because she feels a lot of sensitivity due to her generalized gross decayed teeth. Patient wants to take better care of her oral hygiene but will find it easier when she is no longer in so much pain. Filled out 070 form. Reviewed nutritional counseling and suggested long term use of fluoride. She stated she sometimes uses total care, and recommended she use it daily. Took patients' flipper and cleaned in ultrasonic machine for 15 minutes.Explored remaining dentition for calclus. Proceeded to hand scale plaque. Utilized cavitron as well. Re-expored dentition and re-scaled areas that were missed. Polished with fine grit paste and flossed. Prophy reviewed and approved by Ms.Kamowski.

NV: restorative 25 F and 26 DF

01/24/20	N. Hatoum	Note	H. An	Last Modified: 01/24/20

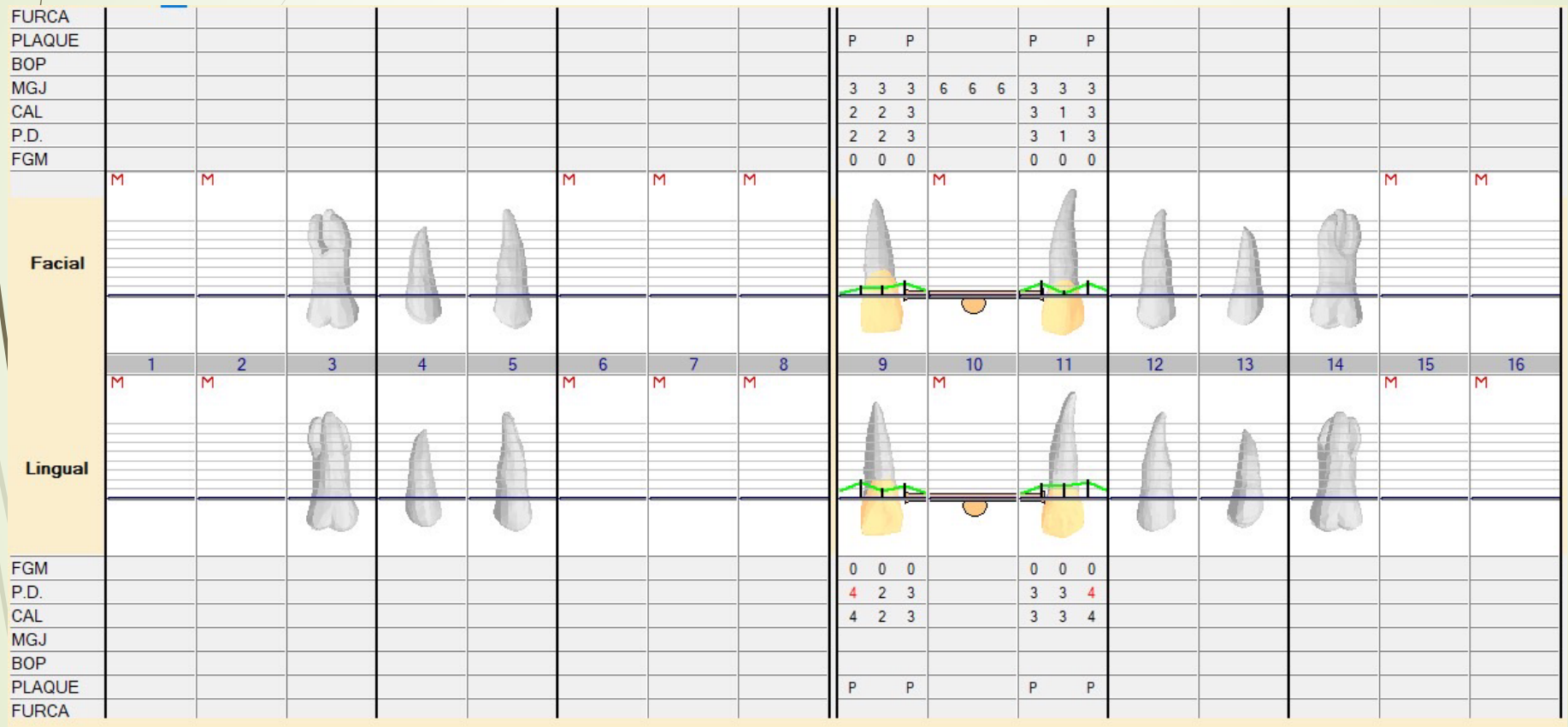
Patient presents for prosth consultation and alginate impressions

RMHx: no changes
BP: 111/77 HR: 77

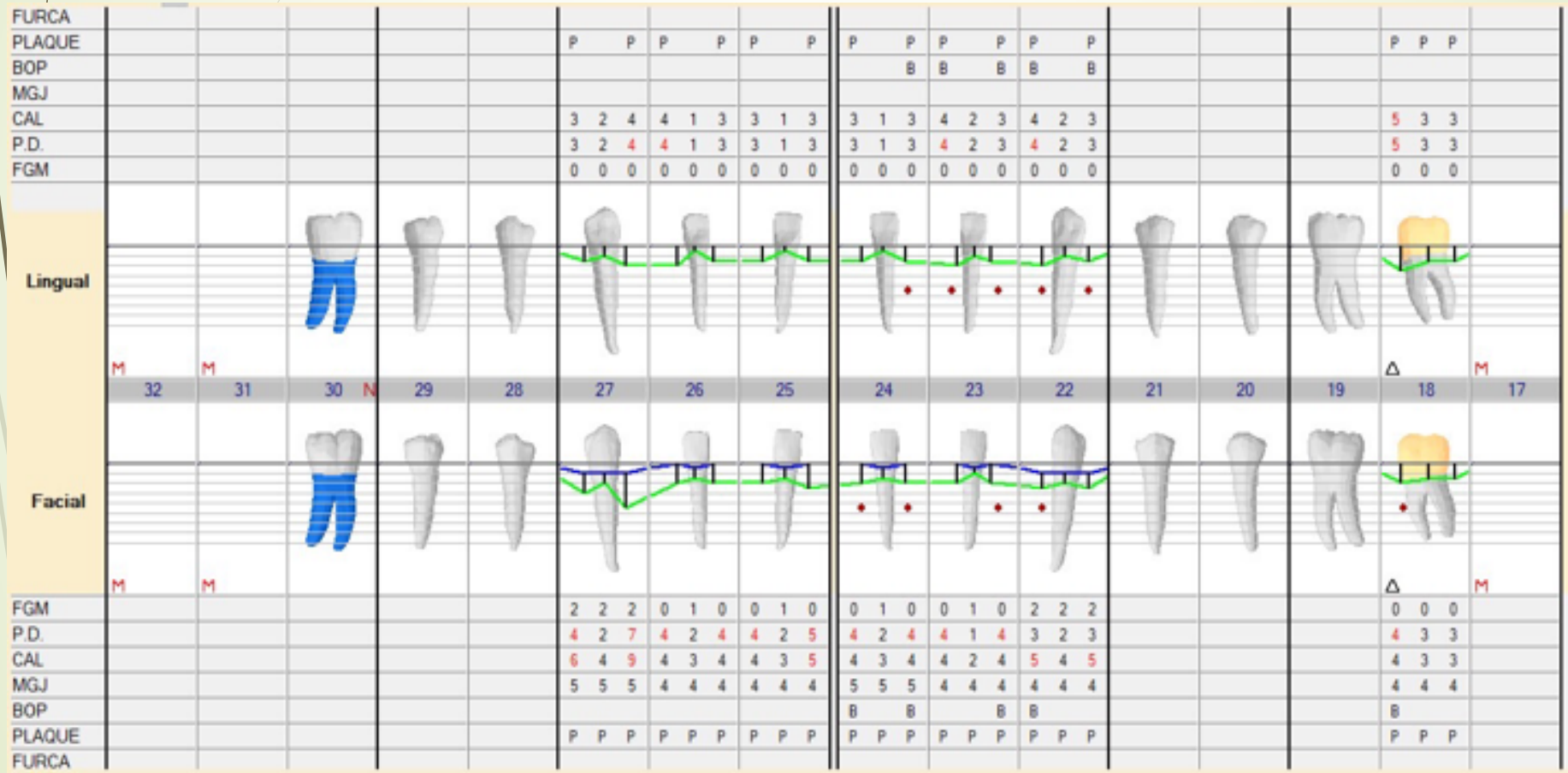
Dr. An consulted with patient about her case. Patient is interested in keeping her lower anterior teeth despite her high caries risk. Dr. An deduced that she must be edentulated on the upper, however she may try to work with her remaining lower teeth and proceed with a RPD if she begins to improve her oral hygiene. The patient is interested in interim dentures and does not yet know what she will do for her final prosthesis. The patient does not want dentures and is interested in implants, however she will make her final decision after she has had her interim dentures in.

Took alginate impressions and poured up diagnostic casts for the fabrication of custom trays.
NV: Final Impressions

Periodontal Charting



Periodontal Charting



Diagnosis

- Gross decay
- Very High caries risk
- Moderate chronic periodontitis

Problem List

- Very high caries risk
- Gross decay
- Bone loss
- Primary caries
- Periodontitis
- Dental pain
- Unhappiness with smile
- Dental illiteracy

D1 Basic Science

- Basic Science Question: What is the difference in microbial population between non-carious and carious teeth?

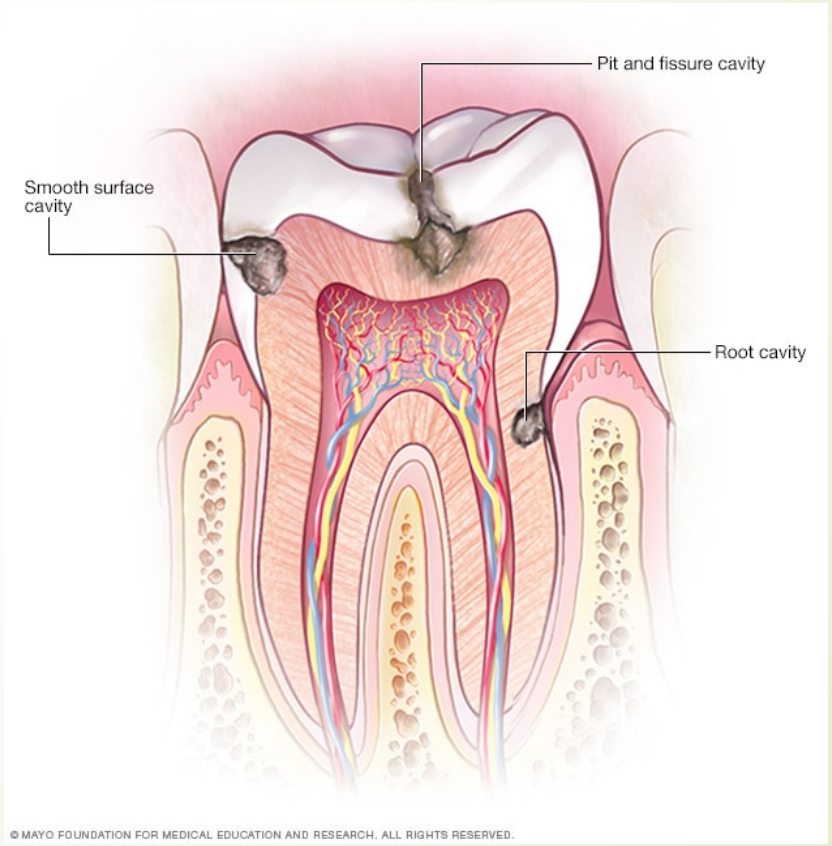
- Non-Carious Teeth:
  - Symbiotic relationship between bacterial species & host
  - Microbial population varies greatly from person-to-person
  - Teeth undergoing demineralization and remineralization consistently

- Etiologic Factors:
  - Diet high in carbohydrates and sugars
  - Insufficient oral hygiene & lack of fluoride
  - Salivary dysfunction
  - Social & demographic

D1 Basic Science Continued

Caries: infectious microbial disease that results in localized destruction of calcified tooth structure

- Carious Teeth:
  - Disruption of homeostatic balance
  - Proliferation of aciduric and acidogenic bacteria
    - Streptococcus mutans – caries initiation
    - Lactobacillus acidophilus – caries progression



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D2 Pathology

- Pathology Question- What are the effects of a constant acidic environment due to diet on the teeth?
- Soda and its effects on the oral environment
  - Acidity
  - Sugar
    - Dental caries as a multifactorial disease
  - Caffeine
- Our patient has a constant intake of soft drinks and has mountain dew mouth
- The effects of soda are similar methamphetamine or crack on the teeth

D2 Pathology Continued…

- Best treatment Option for the patient
  - Implants
  - Dentures
  - Better OHI education
  - Diet education

References

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D3 PICO

- **Clinical Question:**
  - In patients with very high caries risk due to poor dietary and oral hygiene control, how can we realign expectations with restoring their dentition?

PICO Format

P: Patients with high caries risk

I: Middle socioeconomic class

C: low income class

O: Access to dental care

PICO Formatted Question

- Will patients with high caries risk in a middle socioeconomic class compared to a low-income class have better access to care?

Clinical Bottom Line

- Lots of factors such as sex, race, ethnicity, social factor determinants, rural, and socioeconomic impacts are factors that all influence the persons access to care.

- Comparing the middle socioeconomic class to low-income class, the middle class will most likely have more opportunities for access to care because of private health insurance.

- Further research would benefit how to identify more barriers to improve the nations low-income populations oral health.

Search Background

- **Date(s) of search:** 9/28/20, 9/29/20, 9/30/20
- **Database(s) used:** Pubmed, National Academies of Sciences, Engineering, & Medicine.
  - Article's Search: MEDLINE, Embase, Cochrane Central Database.
- **Search Strategy/Keywords:**
- Electronic database search strategy began with basic keywords/MeSH term (socioeconomic status, access to dental care)
- More MeSH terms such as Health Services Accessibility, Global Health helped narrow the search of other studies.
- The presence of the used MeSH terms validated the topic of research by giving consistent research topics.

Search Background

- **MESH terms used:**
- Dental Care/ economics, Global Health, Health Services Accessibility, Healthcare Disparities, Ethnic groups, & socioeconomic factors.

1 . Inequality in Utilization of Dental Services: A Systematic Review and Meta-analysis

- Reda, Sophie F et al. "Inequality in Utilization of Dental Services: A Systematic Review and Meta-analysis." *American journal of public health* vol. 108,2 (2018): e1-e7. doi:10.2105/AJPH.2017.304180
- **Study Design**:
  - Meta-Analysis

Article (1) Synopsis

- Included studies: a total of 117 studies with 7,830,810 participants of the span of the meta-analysis from January 2005 to April 2017.
- 81 studies found income:
  - (OR = 0.66; 95% CI = 0.54, 0.79; *P* < .001)
  - Inequality was significantly higher in North America and Southeast Asia.
  - No significance between low HDI (Human Development Index) and High HDI.
- 25 studies found rural locations:
  - (OR = 0.87; 95% CI = 0.76, 0.97; *P* = .011)
  - Inequality was significantly lower in low HDI than High-HDI.
- 47 studies found ethnic minorities or immigrants:
  - (OR = 0.71; 95% CI = 0.59, 0.82; *P* < .001)
  - Inequality was found to be higher in High-HDI countries than low-HDI.
- Conclusion: Inequalities in dental service utilization are both considerable and globally consistent.
- Overall 7 million participants in this study showed the male participants, ethnic minorities or immigrants, rural, those with lower education or income, or those without insurance were less likely to use the dental services.

Reason for Article (1) Selection

- The article's meta-analysis helped find data to answer the PICO question.
- A high level of evidence.
- The studies that were outliers or had biased findings were analyzed and removed.
- The study is relevant and conducted over a 12-year span.
- No Bias intentions from the authors or organization (American Public Health Association).

2. Access to dental care: Solving the problem for underserved population

- Eslamipour, Faezeh et al. "Access to dental care among 15-64 year old people." *Journal of education and health promotion* vol. 7 46. 3 Apr. 2018, doi:10.4103/jehp.jehp_99_17

- **Study Design:**
  - Systematic Review of cohort studies

Article (2) Synopsis

- A Survey was conducted on age, race, and poverty status from 1983, 1997, & 2002.
- Age:
  - 1983- kids 2-4 were 28.4% in the clinic.
  - 1997-44.1; 2002- 40.1
  - 2002- 80.9% ages 5-17 were in the clinic.
- Race:
  - African-Americans 41.8% in 1987; 55% in 2002
  - Whites 57% in 1987; 65.5% in 2002
- Poverty Status:
  - Below poverty 1997 - 50%; 2002 -47.8%
  - At or above poverty 1997 -67%; 2002 -66.5%
- Conclusion- Barriers need to be addressed and analyzed when identifying underserved segments of a population.
- Demand for dental care, the dental work force and the economic environment all need to be addressed.
- The DHSPA (Dental Health Personnel Shortage Areas) has been attributing to access shortage areas to improve the dental work in underserved regions. Dentist to population ratio is determined for care.

Reason for Article (2) Selection

- This research journal article is reliable but can be considered biased from one author presenting their findings.
- Dr. Albert Guay is a chief policy advisor for the ADA.
- The research is from 2004.
- It follows the PICO question regarding populations being underserved and reasons for not having access to care.

3. Improving Access to Oral Health Care for Vulnerable and Underserved Populations

- IOM (Institute of Medicine) and NRC (National Research Council). 2011. *Improving access to oral health care for vulnerable and underserved populations*. Washington, DC: The National Academies Press
- **Study Design:**
  - Consensus Study Report

Article (3) Synopsis

- In 2011, approximately 33.3 million underserved individuals living in DHPSA.
- No dental insurance=2/3 less likely for oral care compared to people with private insurance.
- In every age group,
  - lower-income group are **more likely** to have had dental caries experience and **more than twice** as likely to have untreated dental caries comparing to high-income people.
- People living below the FPL are **less than half** as likely to have visited a dentists in the past year as those who are **over 400 percent of the FPL**
- March 2011, 4639 dental shortage areas.
  - estimate of 9,642 dentists needed for a 3,000:1 population to practitioner ratio.
- More than half of the population did not visit a dentist in 2004.
- Nearly all measures indicate that low-income, vulnerable and underserved populations access oral health care in very low amounts compared to the middle class.
- Conclusion-
  - "Social determinants also affect oral health and contribute to the inequalities in oral health " (IOM and NRC, 2011)
  - Oral health literacy one of the most important educational concepts to improve the dental health status of these patients.

Levels of Evidence

- ☒ **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)
- ☐ **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

- Access to care is defined mostly by insurance and the countries health care system.
- Data surveys have been conducted in the past near present showing an increase going to the dentist in all socioeconomic classes, but the oral health literacy still needs improvement. Our patient's focus is on her oral health literacy. She needs to understand that her lifestyle and health will influence her dental treatments. Our patient needs to comprehend why a full mouth implant reconstruction would not be an ideal treatment.

- Further research is necessary to understand how we can improve these barriers to improve low-income class commitment to their oral care.
- Recommendations to rural care and Medicaid have been implemented in the past, but still need more work to influence the demand of our nation's oral health.

Conclusions: D4

Based on our research and clinical treatment, our focus with the patient will be in improving their oral health literacy through consistent recall appointments and establishing a dental home here at MUSoD.

Since we began treatment, the patient has had an interim denture delivered. The patient is now more receptive to removable appliances after having learned more about her high caries risk and oral hygiene issues. We will use her healing time to work on improving her oral hygiene habits and creating realistic expectations for her treatment given her current situation.

Discussion Questions (from the rounds website)

- What resources can we provide our patients to help them better understand their caries risk?
- Can more education be implemented within schools of a specific community known to have higher risk of caries development in order to prevent poor oral hygiene and diet at a young impressionable age?
- For patients with low socioeconomic status, how can we best discuss caries risk to help them prevent future dental expenses? What resources do we have available at MUSoD to provide for these patients?

THANK YOU