Rounds 8B-5,

Oral Medicine

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Rounds Team

- Group Leader: Dr. Toburen
- Specialty Leader: Dr. Best
- Project Team Leader: Alexa Zacharias
- Project Team Participants: Emily Zall, Sabrina Swartz, Lluvia Cardenas

Patient:

- Pt was first seen at CDC-North in 01/24/2020
- 61 y.o. caucasian male
- CC: “The pain the clindamycin resolved made me come in"

Medical History

- 1991 Stroke
- 2015 L and R cataracts removal
- 2015 Heart attack
- CABG
- Mitral valve prolapse
- Coronary heart disease
- Has been told needs premed
- 2010-2012? Type II diabetes
- 2016 cervical radiculopathy C3-C6 reinforced with titanium

- Allergies: Bees

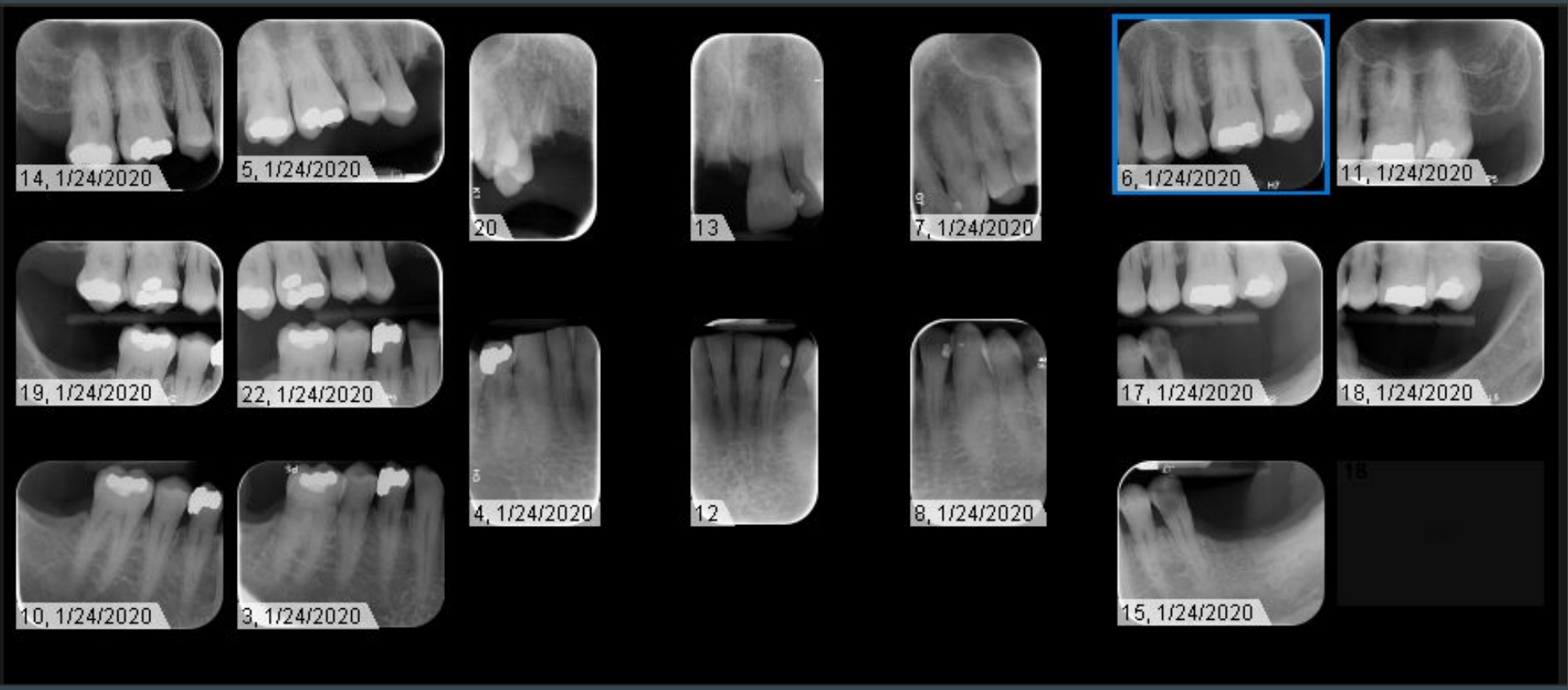
Medical History

- Appointment 1/24/2020
  - Antibiotic, No PCP, no medications, premed?
  - Blood glucose 246 mg/dL
  - Medical consult sent to PCP
- Appointment 8/12/2020
  - Medications: Amoxicillin, Atorvastatin, Gabapentin, Lantus Solostar, EpiPen
  - Blood glucose readings: 307 and 302 mg/dL
  - Medical consult sent to PCP
- HbA1c Readings—11.3—> 11.2
- Diabetic educator

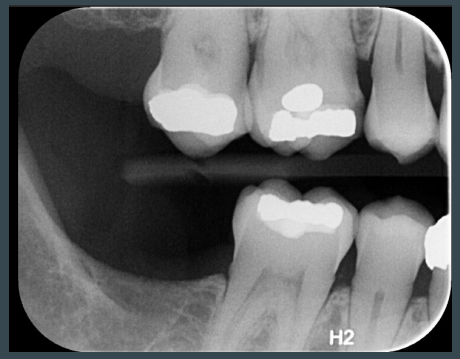
Dental History

- Broken bridge #6-8
- Amalgam tattoo on alveolar ridge #22 1x1mm
- Right mandibular tori
- It has been more than 2 years since last exam, cleaning, radiographs
- Pt has hx of bridges and extractions, RCT, neck pain, pt grinds and bruxes.

Radiographs: FMX



Radiographs findings

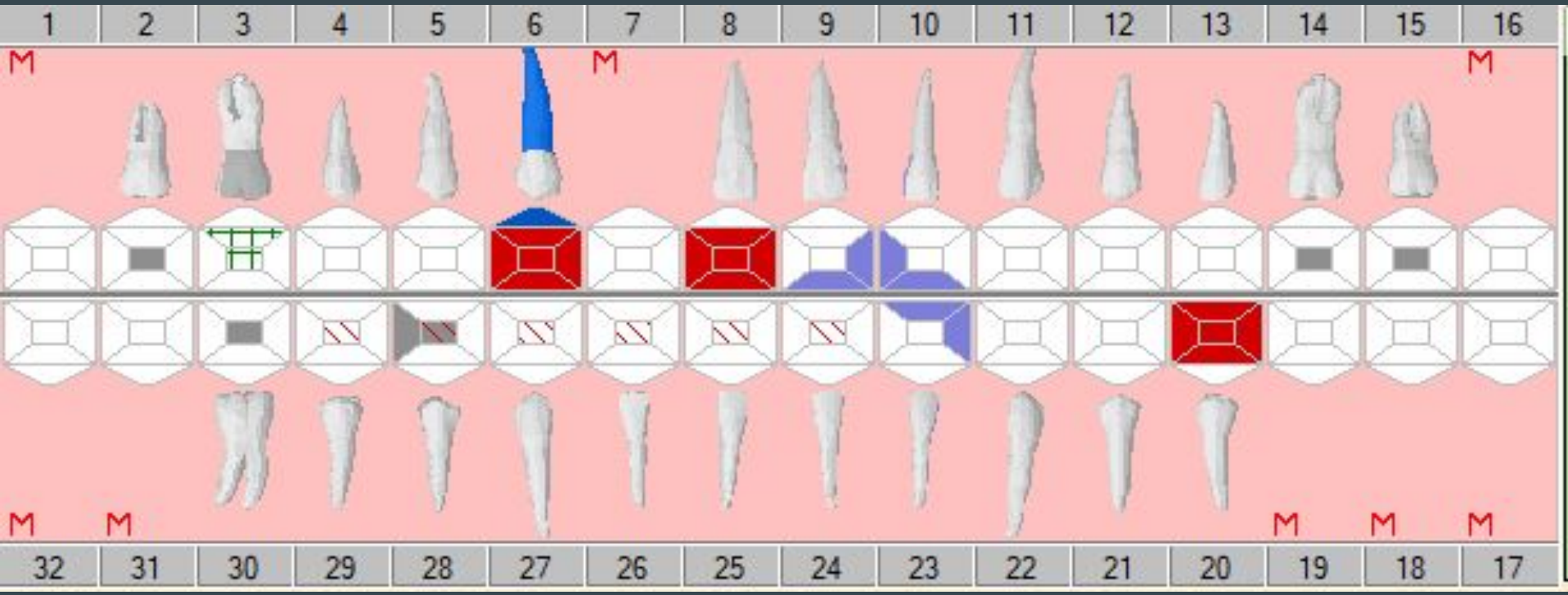


- Generalized horizontal bone loss
- Missing teeth: #1, 7, 16, 17, 18, 19, 31 & 32
- Buccal cusp fracture #3
- Fractured crown #6
- Gross decay #20
- Overhang D of #28
- Amalgam restorations
- Generalized mandibular wear

Radiographs findings:

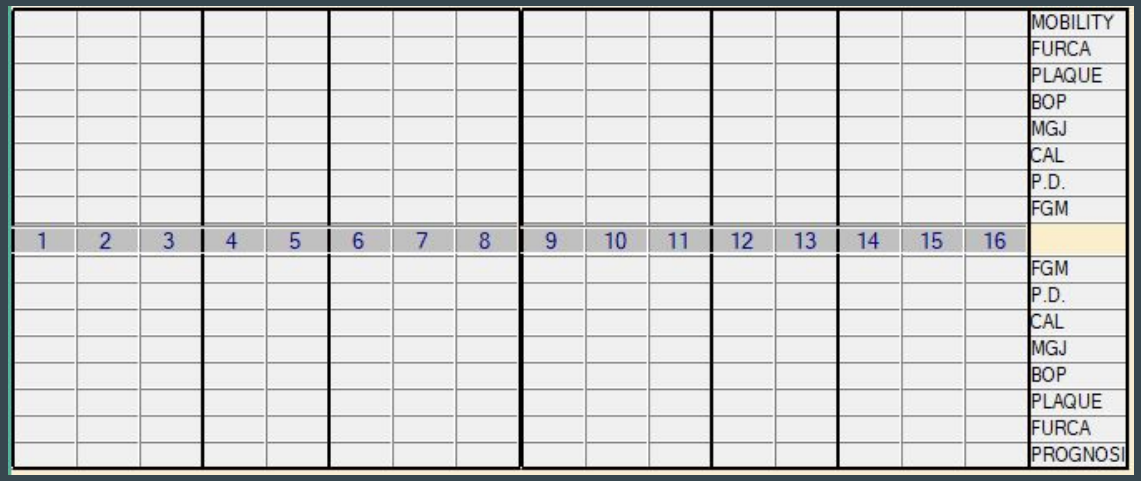
- Previous RCT #6 and 8
- Fractured crown #6 & 8
  - Retained root tips
- Gross decay #20

Clinical Findings: Odontogram



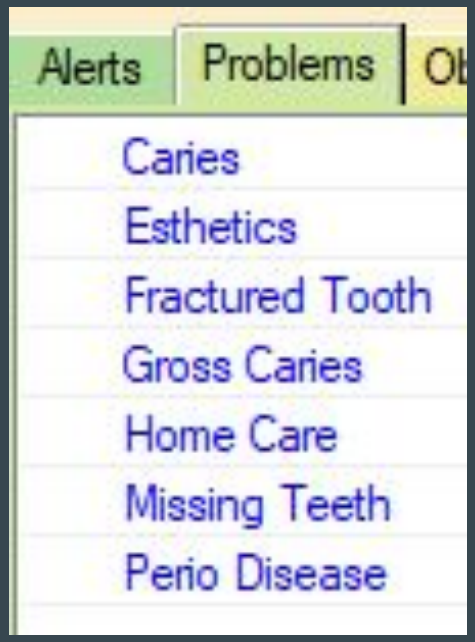
Periodontal Charting

- No periodontal charting performed
- Pt states he needs to take antibiotic prior to dental treatment
- Pt took pre-med prior to appointment on 08/10/2020 when pt arrived with significantly high blood glucose levels



Problem List

- caries
- esthetics
- fractured teeth
- gross caries
- home care
- missing teeth
- perio disease
- wear/bruxism
- sensitivity



Appropriate Clinical Photographs

https://www.healthbenefitstimes.com/glossary/occlusal-wear/
https://www.seasons-of-smiles.com/donald-trump-deregulation-mercury-dental-office.htm

D1 Basic Science "What is Diabetes?"

Chronic health condition that affects how the body metabolizes glucose

Type I:

Cause: Autoimmune reaction that destroys beta cells

- Lack of insulin
- Hyperglycemia

Risk Factors:

- Genetics

Type II:

Cause: Insulin resistance

- Cells do not respond normally to insulin
- Hyperglycemia

Risk Factors:

- Diet/ Lifestyle
- Age
- Weight
- Genetics

Centers for Disease Control and Prevention.2020. What is Diabetes? [Internet]. [cited 19 Sep 2020]. Available from: https://www.cdc.gov/diabetes/basics/diabetes.html

Kharroubi AT, Darwish HM. 2015. Diabetes mellitus: The epidemic of the century. *World Journal of Diabetes* [Internet]. [cited 19 Sep 2020]; 6(6):850-867. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4478580/

D1 Basic Science “What is Diabetes?”

Type I:

- Only 5-10% of Americans with diabetes
- Childrens, teens, young adults

Treatment:

- Insulin medication
- Regular monitoring

Type II:

- 90-95% of Americans with diabetes
- Most common > 45 years old

Treatment:

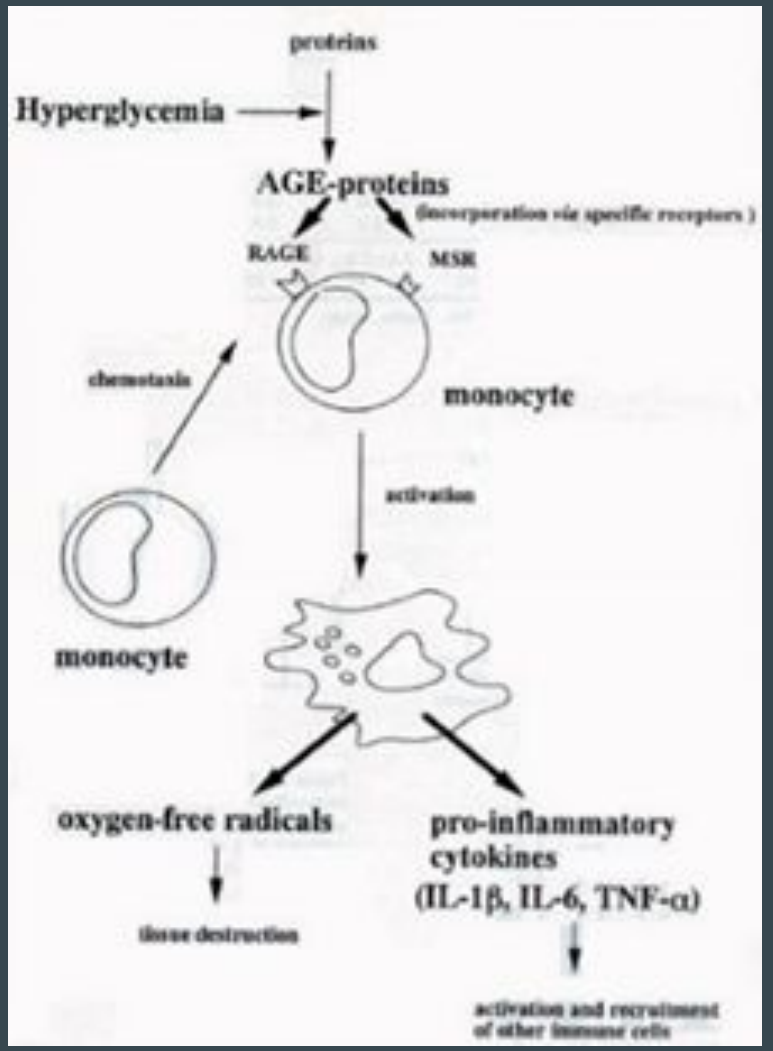
- Diet and lifestyle changes
  - Increase insulin sensitivity
- Insulin medication
- Regular monitoring

Centers for Disease Control and Prevention.2020. What is Diabetes? [Internet]. [cited 19 Sep 2020]. Available from: https://www.cdc.gov/diabetes/basics/diabetes.html

Kharroubi AT, Darwish HM. 2015. Diabetes mellitus: The epidemic of the century. *World Journal of Diabetes* [Internet]. [cited 19 Sep 2020]; 6(6):850-867. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4478580/

D2 Pathology “What oral manifestations are seen in patients with diabetes?”

- Hyperglycemia
- AGE-RAGE activation
  - Advanced Glycation End-product
- Pro-inflammatory cytokines released from Macrophage
- Dysregulation of the immuno-inflammatory response
- Oxygen Reactive Species
- RANKL/OPG complex = osteoclasts



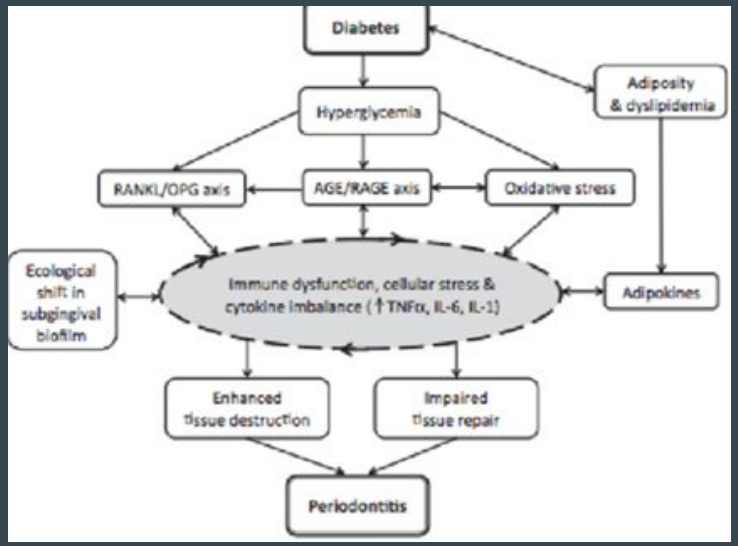
D2 Pathology “What oral manifestations are seen in patients with diabetes?”

Susceptibility

- Xerostomia
- Candidiasis
- Lichen Planus
- Periodontitis
  - Red Complex
    - *T. denticola*
    - *P. gingivalis*
    - *B. forsythus*
- Caries

Prolonged Healing Time

- Activation of osteoclast precursors via IL-1B
- AGE-RAGE protein complex on macrophage



D3 PICO

- Clinical Question:
- Do patients with well-controlled diabetes or uncontrolled diabetes have less dental complications?

PICO Format

P: Patients with diabetes melliltus

I: Controlled

C: Uncontrolled

O: Less complications

PICO Formatted Question

In patients with diabetes mellitus, will patients with controlled diabetes have less complications than patients with uncontrolled diabetes?

Clinical Bottom Line

Patients with controlled diabetes have less complications and better overall oral health.

Search Background

- **Date(s) of Search:** 9/8/2020, 9/12/2020, 9/20/2020
- **Database(s) Used: Pubmed**
- **Search Strategy/Keywords:** dental caries, diabetes mellitus, dental complications

Search Background

- MESH terms used: dental caries, diabetes mellitus, dental complications, treatment outcomes.

Article 1 Citation:

- Citation: de Lima, A., Amorim Dos Santos, J., Stefani, C. M., Almeida de Lima, A., & Damé-Teixeira, N. (2020). Diabetes mellitus and poor glycemic control increase the occurrence of coronal and root caries: a systematic review and meta-analysis. *Clinical oral investigations*, 10.1007/s00784-020-03531-x. Advance online publication. https://doi.org/10.1007/s00784-020-03531-x

- Study Design: Systematic Review and Meta-analysis

Article 1 Synopsis

- Method - Retrieved data from 4047 articles to included in the meta-analysis across 6 databases. This article focused on the occurrence of coronal and root caries in patients with diabetes mellitus.

- Results - Individuals with type 2 DM were three times more likely to have root caries in comparison with non-DM individuals. Individuals with uncontrolled glycemic levels within the population with DM had higher prevalence of caries than individuals with controlled DM

- Conclusions -Diabetes mellitus may increase the occurrence of coronal and root caries in adults. Poor glycemic control turned diabetic individuals more likely to have caries.

Article 1 Selection

- This article was chosen because of its level of evidence as a systematic review and meta-analysis. It also specifically addressed all parts of our PICO question.
- Applicability to your patient: This would be evidence to show to our patient in hope that it would encourage him to get his diabetes under control.

Article 2 Citation, Introduction

- Citation: Gazal, Giath. “Management of an Emergency Tooth Extraction in Diabetic Patients on the Dental Chair.” The Saudi Dental Journal, vol. 32, no. 1, 2020, pp. 1–6., doi:10.1016/j.sdentj.2019.07.004.

- Study Design: Systematic Review

Article 2 Synopsis

- Method - determine the maximum acceptable level of blood glucose for tooth removal in diabetics, show a systematic technique for the management of patients with diabetes on the dental chair.

- Results - Fasting blood glucose level of 240 mg/dl is a critical point for any dental treatment because the warning signs of diabetes start coming out. Maximum acceptable levels of blood glucose for removal of teeth in diabetics are 180 mg/dl (before meal) and 234 mg/dl (2 h after a meal). High blood glucose levels reduce the secretion of nitric oxide in the body, which leads to poor circulation and slow-healing socket. Uncontrolled diabetics are at high risk of infection.

- Conclusions - Fasting blood glucose level of 180 mg/dl is a cut-off point for any selective dental extraction. However, Random blood glucose level of 234 mg/dl (13 mmol/l) is a cut-off point for an emergency tooth extraction. Tightly controlled diabetic patients (blood glucose level below 70 mg/dl) are susceptible to hypoglycemia.

Article 2 Selection

- Selected this article because it pertains to emergency medicine and answers all parts of our PICO question
- Applicability to your patient: Blood glucose readings.

Article 3 Citation, Introduction

- Citation: Vernillo AT. Dental considerations for the treatment of patients with diabetes mellitus. J Am Dent Assoc. 2003 Oct;134 Spec No:24S-33S. doi: 10.14219/jada.archive.2003.0366. PMID: 18196670.

- Study Design: Systematic Review of Case Control Studies

Article 3 Synopsis

- Method - This article discusses new concepts in metabolic control for diabetes and the relationship of oral complications to diabetes mellitus. In consultation with the patient's physician, the dentist may need to modify the treatment plan where systemic complications are present

- Results - Working with the physician, nutritionist and dental hygienist, the dentist can maintain the patient's oral health and possibly improve the patient's metabolic control of diabetes. In consultation with the patient's physician, the dentist can discuss the indications and contraindications of medications for the treatment of oral complications in patients with systemic complications resulting from diabetes. Using a glucometer may avert emergencies related to diabetes

- Conclusions - The dental team can improve the metabolic control of a patient's diabetes by maintaining optimal oral health.

Article 3 Selection

- Selected this article because it addresses the P and the O of our PICO question. It shows the importance a dentist can play in overall health and that it is beneficial to work with a patient's physician if necessary.
- Applicability to your patient: Shows our patient that we care for him and want to help him, but he also has to help himself.

Levels of Evidence

- [x] **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
- [x] **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: how does the evidence apply to this patient?
  - this evidence is strong and shows the importance of having well-controlled diabetes. Hopefully our patient will be convinced to take better care of himself after seeing these articles.
- D4: how will you advise the patient?
  - It is important that the pt get his type II diabetes under control before being seen in a dental setting in order to prevent any health emergency while in the dental chair. In order to get the pt's diabetes under control collaborative care needs to be taken by the pt, the dentist, the PCP and a diabetic educator.. The pt should be monitoring his blood glucose at home as well as consistently watching what he consumes and being in contact with the recommended diabetic educator.

Discussion Questions?