Preparation for Treatment Planning Board

Developing the Alternative Plans. In the process of developing a treatment plan discuss the financial comfort zone with the patient. As taught in treatment planning class, the **ethical practitioner** always presents all feasible options with advantages and disadvantages of each starting with "No treatment" as the first option. Develop these in axiUm as alternate plans or options so the fees are printed out for the patient to evaluate side by side. However, always make clear to the patient that these are only a "best guess" on what is feasible…the "experts" at TPB may see other difficulties, or the situation may be more complex. Do not promise the patient any specific plan or cost at this time. These estimates will help to determine the financial commitment level of the patient.

These alternate plans should be as follows:

1. No financial or time constraints. However, treatments must be feasible: implants must have bone or feasible grafting sites; orthodontics can't be placed on patients with active caries present; it can't involve surgery that is contraindicated for their medical status, etc..
2. Most likely choice for the patient. Given their current time and financial constraints, what is the patient's most likely choice.
3. Any other feasible options. As many as are reasonable in the discussion.

In the written presentation, focus on developing the most realistic plan for this patient, then explain reasonable variations based on their circumstances.

What to have at the appointment:

- Required:
  - **Three hard copies of the treatment presentation**, but DO NOT print out axiUm pages (use as little paper as possible)
  - **Adequate radiographs**, including PAs on endodontically treated teeth
  - Appropriate **vitality testing** (possible abutment abutment teeth, teeth with large restorations, radiolucencies, or other reasons their might be a question on vitality)
  - Completed **periodontal charting** including probing depths, gingival recession, mobility, furcation involvement, Gingival Index and Plaque Index (approved by Periodontal Faculty)
  - Mounted **diagnostic casts**, marked lightly with the highest smile line. Check the mounting intraorally by checking lateral movements and matching them with the patient's movements.
  - Completed **Occlusal Analysis** (approved in Axium)
  - **RPD design** – use the large format design page (single sheet version from Module #2 on the D2L Course site) using correct colors and format
- Optional:
  - Clinical photographs (in a powerpoint or in the chart)… this is really helpful.
  - Diagnostic wax-up or set-up *if* attempted in order to understand the occlusion or anterior spacing issues (diastema closure, for example).

At the Appointment: There will be faculty present at 8:50am/12:50pm to facilitate the first presentation starting on time. Seat the patient, record the blood pressure, pulse and pencil the numbers onto the copies of the treatment plan presentation. Be seated in the appropriate conference room with the Axium chart open at the designated presentation time.
9:00am – Room 4186**; 10:00am** – Room 4188**; 11:00am** – Room 4186
1:00pm – Room 4186**; 2:00pm** – Room 4188; **3:00pm** – Room 4186; **4:00pm** – Room 4188

There will usually be three faculty members present: a Periodontist, a Prosthodontist, and a Restorative faculty. Be prepared to present the patient highlighting the pertinent information from the presentation (do not read the presentation verbatim) in a concise and professional manner (practicing helps!)-

"Ms Toothache is a 59 year old Caucasian female who presented to the school to get a new partial. Her medical history is routine except for ….."

-Questions to anticipate-

Medical History-

- For every **medication**, know what condition the medication is intended to treat. Food is not a medicine. (No need to list "honey" for example, no matter how useful they think it is…)
- If the patient lists a **medical condition**, know if they are taking any medications or other treatment for the condition, and if not, is that by a physician's decision, or theirs.
- **Diabetes**- When did they have their last HbA1c? What was it? What was their last blood sugar reading? When?
- **Hypertension (HTN)**- How many medications are they on? How does their HTN affect their activities of daily living?
- **Anti-coagulation** medications- When was the last INR and what was the number? Why are they being anti-coagulated?

Dental History, Examination, and Risk Assessment:

- Why did the patient **lose their teeth** in past- caries, periodontal disease, or trauma?
- What prompted them to seek care NOW? Was there some precipitation event/pain/complaint?
- Evaluate all existing **endodontic treatment**. Is existing treatment adequate? If not, does it requires an endodontic evaluation? Why?
- What are the patient's **esthetic concerns**?
- **How is the patient currently functioning**? Can they eat anything they want, or are they avoiding certain foods?
- What is their **Caries Risk Assessment**? If they are currently caries active, is the source low saliva or high sucrose or both? If high sucrose, what precisely are the items and how what is the plan to help them eliminate this or find substitutes for these items? What has been prescribed or planned to help manage their caries rate? Be prepared to explain and defend a defined maintenance plan.
- What is their **Periodontal Disease risk**? If they are currently disease active, what is planned or started to improve their oral hygiene? Are there any contributing factors that a dental care provider can influence? Will non-surgical therapy alone can take care of patient's periodontal problem or should the plan anticipate surgical therapy as well? If there are associated systemic risk factors (ex: diabetes, smoking etc.) address those issues as well and how to modify them to get better results.
- Address any pre-prosthetic surgery that will be needed to proceed with each treatment plan.

-Thoughts on Treatment Planning-

A. Endodontics

1. Consider doing <u>pre-emptive endodontic treatment</u> on teeth if it will significantly impact the quality of the final restoration to do endo/post/core later rather than sooner, especially if the tooth already has had significant pulpal insult (deep restorations, change in pulpal size, calcification, etc)
2. In teeth with a <u>questionable endodontic prognosis</u> (i.e., calcified canals, possible split root, perio/endo lesions, etc.) do endodontic procedures early in treatment, especially if the teeth are critical to the plan. If the treatment is not going to be possible, that information is critical to the treatment plan.
3. <u>Restorability</u>. It's always a two part question:
    - Will the tooth be restorable after the endo is completed?
    - Even if it is restorable, ***should*** it be restored? Or is extraction and replacement the *better* plan? Think through the periodontal considerations, the prognosis of the adjacent teeth,

overall caries and periodontal risk, patient interests, and the overall plan for restoration. Don't get tunnel vision on one tooth!

4. Is the tooth important enough (and the result predictable enough) to the total plan to warrant the effort and cost of endodontic therapy and cusp coverage? See previous point again. *Measure twice, cut once.*

B. Periodontics

1. Can the diagnosis and prognosis of each individual tooth be defended based on the charted periodontal findings in light of the planned treatment?
    a. Factors that downgrade the prognosis of a tooth: Attachment loss, furcation involvement, mobility, oral hygiene, systemic factors like smoking or diabetes.
    b. Consider the occlusal and lateral force load of the planned treatment. In other words, what will be expected of the tooth?. For example, if #25 has grade 2 mobility – the tooth can be maintained for a long time by adjusting occlusion and splinting it to the adjacent teeth. But, if #3 has a grade 2 mobility and it is planned as an abutment for RPD – the long term prognosis of that tooth is poor.
    c. Not every class 2 mobility is automatically a hopeless prognosis and not every grade 2 furcation is a poor/hopeless prognosis.
2. Consider the amount of attached tissue in any area where there may be clasps, implants, or crowns. Is it adequate for a healthy prognosis?
3. Patient motivation and compliance plays a major role in being able to maintain the periodontally compromised dentition long-term. Be able to realistically evaluate how compliant this patient will be long term.

C. Orthodontics

The following situations may benefit from consideration of minor tooth movement, and treatment should be offered to a patient *if appropriate*.

a. Tipped Molars - to correct periodontal defect or improve FPD path of insertion
b. Anterior Spacing - to consolidate space for FPD or redistribute space for closure with composite resins
c. Cross articulations - to gain a vertical occlusal stop (posterior) or esthetics (anterior)
d. Root Proximity - to gain room for margin placement
e. Lost Interproximal Space - to regain space for interdental tissue
f. Crowding - to improve either esthetics or access for hygiene

To decide if adjunctive orthodontics is appropriate, ask the following questions:

1. Is the patient totally committed and motivated? Are dietary factors/caries controlled? Hygiene excellent? No active periodontal disease?
2. Is adequate anchorage available? Would the treatment need implants (TADs -Temporary Anchorage Device- that would add surgery and cost and if so, is the patient willing to bear the cost and surgery)
3. Will the result be retainable? Think how it can be fixed into place…an FPD? Fixed retainer? An RPD will not hold it in place.
4. Is there an easier solution to the problem, e.g., a restorative solution, extraction?
5. (*After consideration of all the above*) Will the time and effort required for tooth movement be worth the result? The patient may be the only one who can make this decision.

If orthodontic therapy is chosen, this is the correct sequence of Orthodontic /Periodontal care:

1. Periodontal Initial Therapy (scaling/root planing)
2. Orthodontic treatment
3. Periodontal surgery for pocket elimination

D. Prosthetics Overview. First, decide if missing teeth need to be replaced- not all do. Patients can do well with first molar occlusion, or if the patient has relatively weak biting force [smaller, older patients] second premolar occlusion. Does the patient need a limited occlusal adjustment or complete occlusal adjustment (analysis) before making final decisions? Is a diagnostic wax-up or set-up needed to determine the feasibility of the treatment that is planned? Then the decision is Implant vs Fixed vs Removable. Considerations:

- Implants. Is there adequate bone, both length and width, and no anatomic structures would be invaded? Review how to do "implant math": the width of the implant (3.5, 4.3, or 5.0) + 1.5 mm "halo" in all dimensions. If bone augmentation might be needed, make sure patient would be interested in the additional surgery, time, and cost involved. Make sure patient's medical history has no significant contraindications (i.e., bleeding, uncontrolled diabetes, smoking). Can an implant be used with an RPD to remove the need for a visible clasp (maxillary) or to support a distal extension? Especially on the lower, a single implant per distal extension can be a significant improvement.
- Fixed Partial Denture. Use the most current evidence based literature to determine if an implant or fixed partial denture is the best treatment for the patient. Be able to explain the advantages and disadvantages of each. For example current literature supports single crowns on potential abutment teeth if full coronal restoration is requires with an implant between as a more survivable treatment than a fixed partial denture (if the implant placement is possible).
- Removable Partial Denture. Of course it has a cost advantage, but there are also some esthetic advantages. If there has been bone or soft tissue loss in the anterior, an RPD can provide a better result because the soft tissue can be reproduced along with the teeth. Don't just think of it as the "cheap-out" option!

- **Missing maxillary anterior teeth?** First, know where the smile line is. Mark it on the cast and preferably have high smile line photos. Think of all these options:
    1. Fixed partial denture. If there is already a crown on one abutment, or both abutments, and the pontic space is not adaptable for an esthetic implant there should be a really good reason not to have this at the top of the list. AVOID if abutment teeth are essentially intact, or if patient has a high caries rate, esp on abutment teeth unless things (particularly dietary habits) have changed.
       Pros: Faster, good esthetics, no surgery involved
       Cons: Removes more tooth structure, risks future endodontics in approx. 25%+ teeth, higher failure in high caries rate patients
       Design: Almost always single abutments on each end. Double abutments tend to fail. The most common cantilever design is a lateral incisor cantilevered forward from a *natura*l canine if the lateral is kept out of occlusion. There are other acceptable variations but that is an advanced concept for graduate prosthodontics students. (Remember these rules are *very* different for implant FPDs!)
    2. Resin Retained FPD. Sometimes called a "Maryland Bridge" these have gotten a bad rap because sometimes done poorly, without preparation of abutment teeth. If carefully prepared and in the right location, they can be a good alternative on intact abutments. AVOID if occlusion is heavy on anterior teeth. Best in canine guidance.
       Pros: Saves tooth structure, bonded mostly in enamel. Excellent esthetics.
       Cons: Usually only for single tooth replacement. Must have good enamel on all margins, so requires virtually virgin abutment teeth, so consider implant in that situation first. Tricky preparation, difficult to hide margins. Be sure and practice on patient's casts several times before going to clinic if this is the anticipated treatment.
    3. Implants. In an intact dentition, this is usually the first choice to maintain the integrity of adjacent teeth. AVOID if another restoration is a better option, patient is a poorly

controlled diabetic, smoker, there is not enough bone and the patient is not interested in grafting, or the smile line is high and shows gingival margins. Have a periodontal consult to see if a good result is possible in that case.
Pros: Do not have to prepare adjacent teeth. Less likely to promote caries in high risk patients
Cons: Requires more surgery, more time. Esthetics can be tricky. Treatment planning of gingival architecture critical in high smile line cases.

4. Removable Partial Dentures. This can be the top choice if loss of bone and soft tissue has made esthetics difficult with an FPD or if an implant is not feasible. RPD esthetics is frequently excellent if the clasp visibility can be minimal.
Pros: Can replace missing teeth and soft tissue for reasonably nice esthetics. Can get as many teeth, anterior and posterior, as needed for an economical cost!
Cons: Tends to increase caries rate. Have to take it out at night. Patients cope well with maxillary RPDs and usually have more problems with mandibular RPDs except Class IIIs.

E. Fixed Prosthodontics:

1. Identify the teeth critical to the success of the plan. These will usually be canines and terminal abutments. Spend the time and money to make certain that these have a good prognosis. Don't plan a complex treatment that depends on these teeth for success unless they have a good prognosis.
2. Have a "back-up" plan. Look for possible areas of future failure. When feasible, plan ahead for this possibility. For example: If a tooth is to be a RPD abutment (especially if its prognosis is only fair) and another tooth elsewhere in the arch is to receive a casting, consider its future use as a potential abutment. It may warrant a surveyed crown.
3. Occlusal Plane: Does it need alteration due to extruded teeth? Will a restoration, endodontics, or crown-lengthening surgery be needed to correct the extrusion?
4. Anterior Tooth Replacement: esthetics, function, and phonetics - use the provisional restorations (based on the diagnostic wax-up or pre-operative casts) to guide the lab.
5. Avoid crowns and FPD abutments on mandibular incisors, if possible. Acceptable esthetics is nearly impossible to achieve without endodontics and a post and core.
6. Abutment Factors to Think About:
   a. Crown:root ratio.
   b. Periodontal support. Start with Ante's "rule of thumb" then look for offsetting factors.
   c. Periodontal problems (fluting, furcations, attachment loss)
   d. Pulp/endodontic prognosis
   e. Biologic Width: Examine radiographs prior to tooth preparation. If it is impossible to place a crown margin without encroaching on the biologic width, design a strategy for assessing this problem. . If the tooth requires a substructure, plan on placing the substructure at an appointment prior to preparation/impression. If a new substructure is not needed an initial crown preparation and provisionalization can be accomplished. This latter technique not only allows assessment of potential biologic width violation but offers other advantages as well. First, if crown-lengthening surgery is needed, removal of the temporary crown allows improved surgical access. In addition, the margin preparation can be refined at the time of surgery aiding in a more precise judgment of osseous reduction.
   f. Functional load
7. Occlusion
   a. Changing the occluding vertical dimension (OVD). General Rule: Don't change the OVD. Change it only when absolutely necessary (may require transfer to a resident). When in doubt, refer to General Rule.
   b. Preserving the OVD: If there very few occlusal holding stops, think about how to maintain the OVD when these "holding" teeth are prepared. Think about ways to keep from getting "lost in space." Example: Do the left side independently of the right side or leave a tooth unprepared to hold a

stop and don't prepare that "holding" tooth until other castings or temps are in place to hold the OVD. Other ways are available to keep from losing the OVD references but they're more complicated (positioning jigs, measuring techniques).

c. Centric Occlusion vs. Maximum Intercuspation: If no pathology is present and not many occlusal surfaces are to be restored, MI is preferred. But, if the plan is restoring many occlusal surfaces and the patient can be adjusted to the centric occlusion position, then create a Centric Occlusion. The reason is: MI doesn't exist after preparing all occlusal proprioceptive guides to the habitual occlusion. In that case, the patient needs to be restored in the centric arch of closure.

F. Removable Prosthodontics:

Removable partial dentures should be designed using the principles taught in the Preclinical Removable Partial Denture Course. Removable partial dentures can benefit from implant placement to supplement support, retention and stability using tissue level “snap” attachments. If critical abutment teeth are missing (canines for example) consider this option.

Survey the diagnostic casts. Designing retention where it does not exist and tooth modification will not provide the proper contour is not a solution. Survey crowns must be considered when the proper contours are not available for retention of guide planes. Existing crowns and FPDs can be modified for RPD support but the patient must be made aware if the crown is damaged by this procedure it will need to be replaced at the patient’s cost.

Removable partial dentures are not designed to function with distorted or inadequate occlusal planes. Occlusal planes need to be corrected for RPDs to function properly. Diagnostic set-ups are frequently needed to access the changes that will be needed in opposing teeth in order that the occlusal plane is restored correctly.

G. Treatment Complete/Maintenance

When all active treatment is complete, you should be aware of and list your maintenance and recall plan. Specifically:

1. Caries: What is your long term plan to decrease the patient’s susceptibility for future caries.
2. Periodontal: What is the maintenance plan?
3. Prosthetic: What is your plan to monitor and assess health of your fixed and removable prostheses
4. Endodontic: Many endodontists like to periodically evaluate the status of their completed endodontic therapies

Orthodontic: If orthodontics is a consideration, consult with the orthodontist on retention/stability issues following active orthodontic treatment.