Protocol for the Treatment of Sleep Related Breathing Disorders (SRBD) and Flow Limitations by a Dentist

Obstructive Sleep Apnea (OSA), Upper Airway Resistance Syndrome (UARS), and Temporomandibular Disorders (TMD)

The Metz Center
Columbus, Ohio

Patients can be referred by others (dentist, physician, or patient) or generated from screening for SRBD within the practice. The literature states as many as 20% or more of adults can be affected by SRBD. Recognition that TMD is part of the SRBD spectrum can be one of the largest sources of patient flow. Patients can also be garnered from screening on the practice website or by other forms of advertising that draw attention to SRBD.

Treatment Protocol:

1. Initial Telephone Contact - Patient and general information is gathered. The insurance (medical) company information is recorded, in order to submit a predetermination of benefits claim. Past polysomnographic information is obtained from the sleep physician. (Remember! If the information is old, the severity has probably increased.) If needed, new PSG information is determined with the sleep physician.
    a. PSG
        i. Request a Letter of Medical Necessity from the diagnosing physician
        ii. Determine insurance benefit prior to scheduling appointment (we do not charge for this service)
        iii. Schedule for examination appointment after the patient's benefit is determined, unless the patient says that this is not necessary
        iv. Inform of the exam appointment cost and that it must be paid at time of service and the patient will be reimbursed
        v. Send new patient health history information, and request it be completed prior to the appointed time
    b. No PSG
        i. Phone screening to determine if TMD or Sleep (symptoms based)
        ii. Schedule for appropriate examination (best guess at this point) and informs of fee
        iii. Inform that the fee is to be paid the day of service and insurance will reimburse them
        iv. Send new patient health history information, and request it be completed prior to the appointed time

2. Day of Initial Appointment – Review of Health History by front desk, and reinform the patient of the cost. If the patient is unknown to the practice, the fee is collected prior to appointment. Patient is entered into the practice management software, which allows the attachment of x-rays by the clinical assistant.
    a. PSG completed patient
        i. Review the health history and medication list
        ii. Record Blood Pressure. This is suggested to be done at the end of the appointment due to patient anxiety
        iii. Utilize Epworth screening questionnaire (can also use STOP BANG or Berlin questionnaire)
        iv. Explain to the patient the process for this appointment and answer any questions
        v. Describe the basics of OSA and the reason for taking necessary x-rays
        vi. Take Radiographs:
            1. Bitewings
            2. Periapicals of questionable teeth and all endodontically treated teeth
            3. Panoramic x-ray
            4. Lateral cephalometric x-ray
        vii. Continue with a more thorough explanation of OSA by the Clinical Assistant, and answer patient questions.
            1. The "Flipchart" is used for explanation
            2. The Metz Herbst appliance is demonstrated
            3. The patient is asked to sign the Informed Consent, giving them adequate time to read the form and ask questions.
        viii. Alert the doctor, and make aware of all findings.
            1. Not in front of the patient for the initial presentation to the doctor
            2. Display the x-rays for the doctor during the patient presentation
            3. The doctor walks into the patient's room with full knowledge of all information gathered and conducts a very thorough patient interview
        ix. The doctor performs the following:
            1. Review familial history of OSA comorbidities
            2. Initial the Informed Consent after reviewing with the patient
            3. Demonstrate the airway on the lateral ceph and discuss any dental concerns uncovered by radiographs.
            4. Perform a thorough dental examination, and communicate the findings to the patient
                a. Oral cancer screening
                b. Periodontal evaluation
                c. Condition of teeth

5. Determine nasal patency by asking the patient if they breath well through their nose and consider ENT referral depending on severity

x. Prior to leaving the room the doctor does the following:
    1. Ask if there are any questions or concerns, explaining that the doctor is always available at any appointment to answer questions or concerns.
    2. Thank the patient for choosing our office.
    3. Inform the patient that they are in great hands with the clinical assistant, who has been with the practice "X" number of years. Since the clinical assistant will handle most patient care, it is critical for the patient to know that they are knowledgeable and capable.

xi. Discuss financials and the patient signs agreement. Payment in full for the appliance is required prior to fabrication.
    1. The fee is clearly stated and form signed
    2. All treatment costs are covered through the 6th month check
    3. After 6 months the normal recall appointment charge is "X". It is collected at time of service.
    4. Introduce the Minolta 300i and inform patient of the necessity for 3 nights screening pre and post treatment.
    5. Patient is informed of the importance of the follow-up PSG or HST once the titration is complete to verify efficacy, as well as yearly recall appointments to monitor performance of the appliance therapy

xii. Take impression using normal set alginate and pour within 10 minutes using high strength die stone, or alternatively, an intraoral digital scan is taken for a virtual cast.

xiii. Use a *George Gauge* to record the bite relationship (Refer to demonstration on Great Lakes website) at 40-60% of maximum protrusion. If this advancement causes the patient discomfort, reduce the protrusion percentage.

b. TMD Patient (Protocol for TMD is followed. A fully detailed manual is available from our office.)
    i. Review the health history and medication list
    ii. Record Blood Pressure. This is suggested to be done at the end of the appointment due to patient anxiety
    iii. Utilize Epworth screening questionnaire (can also use STOP BANG or Berlin questionnaire)
    iv. Explain to the patient the process for this appointment and answer any questions
    v. Describe the basics of TMD and the reason for taking necessary x-rays
    vi. Take Radiographs:
        1. Bitewings

2. Periapicals of questionable teeth and all endodontically treated teeth
3. Panoramic x-ray
4. Lateral cephalometric x-ray

vii. Continue with a more thorough explanation of TMD and its relationship to OSA by the Clinical Assistant, and answer patient questions.
1. The "Flipchart" is used for explanation
2. The Metz Anterior and Pivotal appliances are demonstrated
3. The clinical assistant performs two stress tests of the system. Both the anterior leaf gauge test and cotton roll test over the premolars is conducted.
4. The patient is asked to sign the Informed Consent, giving them adequate time to read the form and ask questions.

viii. Alert the doctor, and make aware of all findings.
1. Not in front of the patient for the initial presentation to the doctor
2. Display the x-rays for the doctor during the patient presentation
3. The doctor walks into the patient's room with full knowledge of all information gathered and conducts a very thorough patient interview

ix. The doctor performs the following:
1. Initial the Informed Consent after reviewing with the patient
2. Demonstrate the airway on the lateral ceph and discuss any dental concerns uncovered by radiographs.
3. Establish credibility through dialogue and establish why our office is different from the others. It is especially important to do this step if the patient has had failed treatments in the past.
4. Perform a thorough dental examination, and communicate the findings to the patient
    a. Oral cancer screening
    b. Periodontal evaluation
    c. Condition of teeth

x. Generally, begin treatment with the Metz Anterior Appliance, and state that this is both diagnostic and therapeutic. In plain language this means that at the first follow-up appointment, most patients are at least 50% improved and most improve totally by the second or third follow-up. However, if the pain does not resolve two conditions are possible:
1. The TM joint is involved and at the first follow-up appointment the pain will have centered directly in front of the ear. This patient must then follow the route of the pivotal appliance.

2. The patient is an Upper Airway Resistance Patient (UARS) and the correct treatment will be screening with a Minolta 300i and then placement of a Metz Herbst appliance. The patient is better but not gone…or the patient must wear appliance 24X7 to have relief.

xi. Prior to leaving the room the doctor does the following:
    1. Ask if there are any questions or concerns, explaining that the doctor is always available at any appointment to answer questions or concerns.
    2. Thank the patient for choosing our office.
    3. Inform the patient that they are in great hands with the clinical assistant, who has been with the practice "X" number of years. Since the clinical assistant will handle most patient care, it is critical for the patient to know that they are knowledgeable and capable.

xii. Discuss financials and the patient signs agreement. Payment in full for the appliance is required prior to fabrication.
    1. The fee is clearly stated and form signed
    2. All treatment costs are covered through two follow-up appointments.
    3. After the seating appointment and two follow-up appointments, the patient is informed that a follow-up appointment charge will be incurred. Follow-up appointments are paid at the time of service.

xiii. State clearly that our success rate with TMD is approximately 90%. However, that means a 10% failure rate…not to worry we have the answer for this group of patients. Refer back to stress tests and TMD Protocol.

xiv. Take impression using normal set alginate and pour within 10 minutes using high strength die stone, or alternatively, an intraoral digital scan is taken for a virtual cast. (Refer to TMD Protocol, if you have a question concerning the fabrication technique.)

xv. Discuss the need for three nights of screening using the Minolta 300i. This is required.
    1. An absolute rule in the office is to refer any patient scoring higher than a 5 RDI (Respiratory Disturbance Index) on the Minolta/Patient Safety software to a sleep physician or setup a Home Sleep Test (HST) with a physician review. DO NOT REFER FOR HST WITHOUT GOING THROUGH REFERING SLEEP PHYSICIAN! YOU WILL LOSE THE REFERRAL SOURCE. Any person testing higher than a 5 AHI (Apnea Hypopnea Index) must have a Letter of Medical Necessity in chart, prior to placement of a Metz Herbst appliance.

2. Be careful here…. physicians generally do not recognize UARS as a problem and will say the patient is normal. I have heard, "These dentists get a little knowledge and think everybody has a problem the dentist needs to fix"; the inference is that we are selling the patient something they do not need. Be ready! YOU can count on this happening.
3. As previously stated, I do not refer patients who have an RDI of 5 or less. Physicians do not want to see them.
4. Insurance will not generally pay for UARS…but many times these patients will have significant daytime sleepiness/fatigue. I always say, "The good news is that you do not have OSA, the bad news is, you have to pay for the appliance yourself." The converse is powerful to state as well.

xvi. Make patients aware of possible choices. Physicians will generally only offer CPAP and many will strongly discredit the oral appliance. Statements such as "unproven" are common. Many sleep physicians and primary care docs are unaware of the "Principles of Practice" statement by the American Academy of Sleep Medicine (AASM), which states that oral appliances are equal to CPAP for mild to moderate OSA and anyone unwilling or unable to tolerate CPAP. The Australian researcher Peter Cistulli has demonstrated that health outcomes are the same with Oral Appliances and CPAP for the severe OSA patient. The dentist must make a strong case for the oral appliance, prior to them being seen by the sleep physician or the HST provider. Patients have the right to decide their treatment. Many studies have shown overwhelming preference for the oral appliance compared to CPAP.

c. Sleep Patient without PSG (Patient may come to the practice with TMD as the chief complain. However, initial screening by the clinical assistant uncovers significant sleep related symptoms.)
   i. Review the health history and medication list
   ii. Record Blood Pressure. This is suggested to be done at the end of the appointment due to patient anxiety
   iii. Utilize Epworth screening questionnaire (can also use STOP BANG or Berlin questionnaire)
   iv. Explain to the patient the process for this appointment and answer any questions
   v. Describe the basics of OSA and the reason for taking necessary x-rays
   vi. Take Radiographs:
      1. Bitewings
      2. Periapicals of questionable teeth and all endodontically treated teeth
      3. Panoramic x-ray

4. Lateral cephalometric x-ray

vii. Continue with a more thorough explanation of OSA by the Clinical Assistant, and answer patient questions.
    1. The "Flipchart" is used for explanation
    2. The Metz Herbst appliance is demonstrated
    3. The patient is asked to sign the Informed Consent, giving them adequate time to read the form and ask questions.

viii. Alert the doctor, and make aware of all findings.
    1. Not in front of the patient for the initial presentation to the doctor
    2. Display the x-rays for the doctor during the patient presentation
    3. The doctor walks into the patient's room with full knowledge of all information gathered and conducts a very thorough patient interview

ix. The doctor performs the following:
    1. Review familial history of OSA comorbidities
    2. Initial the Informed Consent after reviewing with the patient
    3. Demonstrate the airway on the lateral ceph and discuss any dental concerns uncovered by radiographs.
    4. Perform a thorough dental examination, and communicate the findings to the patient
        a. Oral cancer screening
        b. Periodontal evaluation
        c. Condition of teeth
    5. Determine nasal patency by asking the patient if they breath well through their nose and consider ENT referral depending on severity

x. Prior to leaving the room the doctor does the following:
    1. Ask if there are any questions or concerns, explaining that the doctor is always available at any appointment to answer questions or concerns.
    2. Thank the patient for choosing our office.
    3. Inform the patient that they are in great hands with the clinical assistant, who has been with the practice "X" number of years. Since the clinical assistant will handle most patient care, it is critical for the patient to know that they are knowledgeable and capable.

xi. Discuss financials and the patient signs agreement. Payment in full for the appliance is required prior to fabrication.
    1. The fee is clearly stated and form signed
    2. All treatment costs are covered through the 6th month check
    3. After 6 months the normal recall appointment charge is "X". It is collected at time of service.

4. Introduce the Minolta 300i and inform patient of the necessity for 3 nights screening pre and post treatment.
5. Patient is informed of the importance of the follow-up PSG or HST once the titration is complete to verify efficacy, as well as yearly recall appointments to monitor performance of the appliance therapy

xii. If the patient and doctor agree, dispense the Minolta 300i.
1. The cost is clearly stated for the three-night trial.
2. The Metz Herbst fee does not cover the three-night trial. The fee includes the follow-up consultation with the doctor.

xiii. Schedule a consultation appointment for the doctor to explain the outcome of the Minolta/Patient Safety testing.
1. An absolute rule in the office is to refer any patient scoring higher than a 5 RDI (Respiratory Disturbance Index) on the Minolta/Patient Safety software to a sleep physician, or to set up a Home Sleep Test (HST) with a physician review. Any person testing higher than a 5 AHI (Apnea Hypopnea Index) must have a Letter of Medical Necessity in chart, prior to placement of a Metz Herbst appliance.
2. If the person has an AHI of 5 or less, medicine considers them to be "normal" but probably a UARS patient. The use of a Metz Herbst is indicated, especially if there are comorbidities associated with OSA present in the immediate family, or if TMD symptoms that have been shown with the stress tests are of concern.

xiv. Make the patient aware of possible choices. Physician will generally only offer CPAP and many will strongly discredit the oral appliance. Statements such as "unproven" are common. Many sleep physicians and primary care docs are unaware of the "Principles of Practice" statement by the American Academy of Sleep Medicine (AASM), which states that oral appliances are equal to CPAP for mild to moderate OSA and anyone unwilling or unable to tolerate CPAP. The Australian researcher Peter Cistulli has demonstrated that health outcomes are the same with Oral Appliances and CPAP for the severe OSA patient. The dentist must make a strong case for the oral appliance, prior to them being seen by the sleep physician or the HST provider. Patients have the right to decide their treatment. Many studies have shown overwhelming preference for the oral appliance compared to CPAP.

3. Second Appointment
   a. OSA patient with PSG/Letter of Medical Necessity
      i. Address questions and concerns since the initial appointment
      ii. Record Blood Pressure. This is suggested to be done at the end of the appointment due to patient anxiety
      iii. Demonstrate the appliance

iv. Review the Informed Consent
v. Try-in the appliance
    1. Dismantle and adjust maxillary and mandibular portions separately, with patient comfort being primary concern
    2. Patient is asked to remove each portion separately
    3. Arms are reattached with minimal advancement, and patient is asked to remove the assembled appliance, again, asking patient about comfort
    4. Appliance is adjusted to approximately 3 mm of advancement
vi. Maintain the patient is at that advancement for ten minutes to verify comfort
vii. If 3mm does not cause an issue, adjust to 4 mm of advancement. The goal is to determine what protrusion is acceptable. Generally, the acceptable range will fall within the 40-60% of maximum protrusion recorded by the George Gauge
viii. Once horizontal protrusion is determined, begin the vertical adjustment utilizing cephalometric protocol detailed in the paper by Dr. Metz (Hyoid position is a critical variable in the titration of a mandibular advancement device for the treatment of obstructive sleep apnea)
ix. Deliver and review care instructions for the appliance
x. Prescribe Prevident Fluoride Gel, and direct patient to add one drop per quadrant every night, prior to use
xi. Explain bite tab use for deprogramming (reseating the bite) in the morning and give tabs to patient
xii. Advise patient to call and speak with clinical assistant if there is a question or concern
xiii. To control pain use one of two medications, Medrol or Ibuprofen (refer to dosage and use amounts recommended by manufacturer). If patient has any medical issue, clear the prescription with primary care physician.
xiv. Reappoint patient for 2 weeks follow-up

b. TMD Patient
    i. Address questions and concerns since the initial appointment
    ii. Demonstrate the appliance
    iii. Review the Informed Consent
    iv. Seat appliance according to guidelines (different for Anterior and Pivotal Appliance – Refer to TMD Protocol)
    v. Have patient remove appliance, again asking about comfort.
    vi. Deliver and review care instructions for the appliance
    vii. Prescribe Prevident Fluoride Gel, and direct patient to add one drop per quadrant every night, prior to use
    viii. Advise patient to call and speak with clinical assistant if there is a question or concern

ix. To control pain use one of two medications, Medrol or Ibuprofen (refer to dosage and use amounts recommended by manufacturer). If patient has any medical issue, clear the prescription with primary care physician.
x. Reappoint patient for 2 weeks follow-up

c. Sleep Patient without PSG
    i. Review the Minolta 300i screening with patient (Refer to Flowchart for Pulse Oximetry)
        1. If the RDI is 5 or less a referral is generally not necessary
            a. Discuss TMD treatment option and Metz Appliance option
            b. Depending on decision by the patient, initiate treatment as above
        2. If RDI is greater than 5 a referral is indicated
            a. HST
            b. Sleep Physician

4. First follow-up appointment after insertion of appliance
    a. Metz Herbst Appliance
        i. Address any questions or concerns, again asking patient about comfort
        ii. Record Blood Pressure. This is suggested to be done at the end of the appointment due to patient anxiety
        iii. Adjust appliance to approximately 1 mm or more of advancement
        iv. Maintain the patient is at that advancement for ten minutes to verify comfort
        v. Review care instructions for the appliance, stressing the use of Prevident Fluoride Gel.
        vi. Explain bite tab use for deprogramming (reseating the bite) in the morning and give tabs to patient
        vii. Advise patient to call and speak with clinical assistant if there is a question or concern
        viii. To control pain use one of two medications, Medrol or Ibuprofen (refer to dosage and use amounts recommended by manufacturer). If patient has any medical issue, clear the prescription with primary care physician.
        ix. Reappoint patient for 2 weeks follow-up
    b. TMD Appliance
        i. Address any questions or concerns, again asking patient about comfort
        ii. Review care instructions for the appliance, stressing the use of Prevident Fluoride Gel.
        iii. Advise patient to call and speak with clinical assistant if there is a question or concern
        iv. To control pain, refer to TMD Protocol. Generally it is because the Anterior Appliance has posterior contact and the Pivotal Appliance will have anterior contact.

1. The meds previously discussed can be used if pain is still a problem
2. The patient should be 40-60% better with Anterior and only have pain after chewing with the Pivotal

v. Reappoint patient for 2 weeks follow-up

5. Second Appointment after Insertion
    a. Metz Herbst
        i. Address any questions or concerns, again asking patient about comfort
        ii. Record Blood Pressure. This is suggested to be done at the end of the appointment due to patient anxiety
        iii. If the patient feels sleep is much improved, dispense a Minolta 300i to ascertain progress
        iv. If appliance is "not there" adjust to approximately 1 mm or more of advancement
        v. Maintain the patient is at that advancement for ten minutes to verify comfort
        vi. Once advancement is in the 5 to 7 mm range, repeat ceph protocol. The hyoid is totally controlled by muscle and its position will change after the initial vertical adjustment
        vii. If airway appears open but "cloudy" with ceph, the patient is advanced 7mm, but Minolta shows apneas or hypopneas are still present, refer to ENT to treat GERD/LPR.
        viii. Review care instructions for the appliance, stressing the use of Prevident Fluoride Gel.
        ix. Explain bite tab use for deprogramming (reseating the bite) in the morning and give tabs to patient
        x. Advise patient to call and speak with clinical assistant if there is a question or concern
        xi. To control pain use one of two medications, Medrol or Ibuprofen (refer to dosage and use amounts recommended by manufacturer). If patient has any medical issue, clear the prescription with primary care physician.
        xii. Reappoint patient for 2 weeks follow-up
    b. TMD – This is the last appointment included with the initial fee
        i. Address any questions or concerns, again asking patient about comfort
        ii. Review care instructions for the appliance, stressing the use of Prevident Fluoride Gel.
        iii. Advise patient to call and speak with clinical assistant if there is a question or concern
        iv. To control pain, refer to TMD Protocol. Generally it is because the Anterior Appliance has posterior contact and the Pivotal Appliance will have anterior contact.
            1. The meds previously discussed can be used if pain is still a problem

2. The patient should be much improved

v. Explain and recommend the screening with Minolta 300i
    1. Emphasize the family history of airway and comorbidities
    2. If TMD symptoms have not resolved, a Metz Herbst is indicated for remaining symptoms
    3. Explain that there are two methods to treat TMD
        a. Traditional with appliances
        b. Remove the reason for the muscles to hold the airway open by placing a Metz Herbst
vi. If patient accepts the screening, dispense a Minolta 300i
    1. A charge is incurred for the Minolta 300i testing
vii. Reappoint patient
    1. Screening consult
    2. Continue with appliance
        a. Pivotal treatment is 1 – 2 years in duration without Metz Herbst or is used for about 6 weeks after Metz Herbst insertion
        b. Anterior can be used as a traditional TMD appliance. Caution the patient that this is relieving symptoms but not addressing the cause
viii. Present a comprehensive examination with mounted casts, if Minolta is not being considered

6. Third appointment after seat
    a. Metz Herbst and TMD appliance – continue the same as with second appointment after seat
7. Six-month follow-up
    a. Metz Herbst
        i. Address any questions or concerns, again asking patient about comfort
        ii. Record Blood Pressure. This is suggested to be done at the end of the appointment due to patient anxiety
        iii. Review the health history and medication list
        iv. Utilize Epworth screening questionnaire (can also use STOP BANG or Berlin questionnaire)
        v. If the patient feels sleep is much improved, dispense a Minolta 300i to ascertain progress
        vi. Check for "bite changes"
            1. Explain and Document
            2. Add an Anterior TMD appliance in the morning, replacing the bite tabs. No charge for this appliance
            3. Follow-up on any bite changes in two weeks
        vii. With improvement demonstrated with patient's sleep and the Minolta 300i, refer the patient back to sleep lab for PSG or HST to confirm efficacy of oral appliance therapy; if the patient refuses this step, it is crucial to document their refusal and have them sign off on it

b. TMD
    i. Address any questions or concerns, again asking patient about comfort
    ii. Check for "bite changes"
        1. Explain and Document
        2. Follow-up on any bite changes in two weeks.
    iii. Emphasize the use of Minolta for screening
    iv. Present a comprehensive examination with mounted casts, if Minolta is not being considered

8. Appliance patients are to be seen annually for their recall examination, to verify the effectiveness of the appliance and address any changes in comfort or symptoms. The patient will incur a separate fee for this appointment and for any Minolta 300i readings. At these appointments do the following as needed:
    a. Review the health history and medication list
    b. Repair or adjust appliance
    c. Use Minolta 300i screening to verify any adjustments
    d. Utilize Epworth screening questionnaire (can also use STOP BANG or Berlin questionnaire)
    e. If the patient is unwilling or unable to keep their annual recall exams, send a certified letter via U.S. Postal Service requesting that they discontinue use of the appliance until they are re-evaluated in the office, in order to ensure that the therapy is performing as it should