



Improving CPAP Treatment Adherence via Cognitive Behavioral Therapy (CBT)

*(This page intentionally left blank)*

## Sleep Centers of Middle Tennessee: Improving CPAP Treatment Adherence via Cognitive Behavioral Therapy (CBT)

Multiple therapeutic approaches have been used in an attempt to increase nasal continuous positive airway pressure (CPAP) treatment adherence in patients diagnosed with obstructive sleep apnea (OSA). One such therapeutic approach is cognitive behavioral therapy (CBT), which has been used shown in recent research to improve CPAP treatment adherence significantly (Richards et al, 2007). Other research has focused on successful utilization of variations of CBT that incorporated multiple behavioral approaches and social cognitive theory (Aloia et al, 2004; Aloia et al, 2005; Weaver, 2005). Broadly defined, CBT includes cognitive approaches designed to positively alter patients' attitudes and beliefs regarding OSA and CPAP treatment, in addition to behavioral interventions focused on positively changing patients' behaviors with respect to CPAP usage.

One defining feature of the Sleep Centers of Middle Tennessee model is its inclusion of a CBT "program" to increase CPAP treatment adherence. This CBT program is broken down into brief modules to be administered by various clinical personnel at different stages in the assessment, diagnosis, and treatment phases of the sleep evaluation process. Sleep Centers of Middle Tennessee's approach to the administration of CBT involves the use of motivational interviewing (Miller & Rollnick, 2002). Motivational interviewing entails posing key questions to patients in a supportive and empathic manner, in an attempt to foster a dialogue, share information, and ultimately increase their motivation to change. Aloia et al (2004) outlined a CBT-derived program of motivational enhancement therapy based largely on motivational interviewing, which describes the five key concepts of motivational enhancement therapy and their application to CPAP treatment adherence in patients with OSA (see Table 1). These key concepts may be helpful to keep in mind as Sleep Centers of Middle Tennessee's CBT program is administered. One especially important idea to bear in mind in administering Sleep Centers of Middle Tennessee's CBT program is: *the atmosphere in which questions are posed (i.e., support, empathy) is just as important as the actual content of the questions.*

Sleep Centers of Middle Tennessee's CBT program is administered over the course of several brief modules, beginning with the first patient encounter. The modules are essentially key questions to be posed to the patient, along with a general guideline for key pieces of information that should be shared with the patient as part of the dialogue created by the questions. In other words, the clinician administering CBT poses questions for two primary reasons: 1) to encourage the patient to bring issues to the surface about which he or she has concerns, and 2) to pass along important educational information regarding OSA and CPAP at different stages of the sleep evaluation process. The dialogue fostered by the questions and the educational information shared should serve to alter the patient's cognitions with respect to OSA and nasal CPAP, bolster the patient's sense of self-efficacy with respect to using nasal CPAP, and ultimately increase treatment adherence. Outlined below are the modules of Sleep Centers of Middle Tennessee's CBT program, and Figure 1 "maps" where each module is administered in the sleep evaluation process. Each module contains two

components: Key Questions (questions to be posed by the clinician in his or her encounter with the patient) and Information (educational information to be shared with the patient as part of the dialogue). The printed modules may be used in a “quick reference” fashion during patient encounters or may be incorporated into patient progress note templates. It should be noted that many thorough sleep clinicians might already cover some of the questions and information included in the Sleep Centers of Middle Tennessee CBT program. The program outlined below is simply a suggested guideline for when and how to incorporate these components, with the ultimate goals of improving CPAP treatment adherence uniformly at Sleep Centers of Middle Tennessee sites.

# Sleep Centers of Middle Tennessee: Improving CPAP Treatment Adherence via Cognitive Behavioral Therapy (CBT)

## CBT Program Modules

### I. Initial evaluation – CBT by Advanced Practice Provider (APP)/MD

A. This encounter is typically the new patient consultation. The clinician's focus should be on information gathering, diagnostic formulation, provision of educational information regarding OSA and its potential consequences on quality of life and health, and introduction of CPAP as a possible method of treatment.

#### B. Key Questions

1. Are you familiar with nasal CPAP? (If the patient's response to the affirmative, go to question ii; if not, proceed to question iii)
2. What is your impression of nasal CPAP based on what you have heard?
3. If nasal CPAP looks like the best treatment option for you, are you open to trying a trial of CPAP?

#### C. Information

1. The majority of patients who are prescribed nasal CPAP are able to derive long-term benefit from using this treatment.
2. Nasal CPAP, like any other treatment, has potential drawbacks, with the two main drawbacks being: a) having to wear a mask during sleep (though the equipment these days is much less cumbersome), and b) it is a night-to-night fix – if patients do not wear the CPAP mask, they will return to snoring and having stoppages in breathing.
3. Nasal CPAP also has many benefits, including drastic improvements in quality of life (i.e., daytime fatigue and/or EDS), and avoidance of potential health consequences (i.e., risk for stroke, heart attack, certain types of heart disease). Many patients being to see “symptom relief” very quickly - even within days after starting nasal CPAP.
4. At this point, we ask that patients remain open to trying a *trial* of nasal CPAP, should it turn out that CPAP looks like the best treatment option.

#### D. Patient Questions/Open Dialogue

## II. Diagnostic PSG – CBT by RPSGT (Sleep Tech)

A. This encounter will begin before the patient’s “hook-up”, and will involve viewing a documentary-type video (to be provided) containing an OSA patient’s personal story of the assessment, diagnosis, and treatment with nasal CPAP. The video will contain images of the sleep study, introductory information about nasal CPAP, the different types of masks, features of CPAP (e.g., heated humidity, flexible delivery of pressure), and variations of positive airway pressure devices (i.e., nasal BiPAP). The video will also be personalized by the sleep physician at the Sleep Centers of Middle Tennessee site, in that splices of information from the patient’s personal sleep physician will be incorporated. After the video is viewed, the sleep tech is to administer CBT.

### B. Key Questions

1. Do you have any questions about the video?
2. Can you relate to the patient’s story in the video?
3. After your consultation appointment with the sleep doctor and after watching the video, what is your understanding about what causes OSA?
4. What was the main issue that prompted you to seek a sleep evaluation?
5. Have your OSA symptoms been a concern to your significant other and/or your family (i.e., snoring, EDS, health)?
6. Do you have any questions about what is going to happen tonight?

### C. Information

1. OSA is an increasingly prevalent problem, is largely under-diagnosed.
2. OSA can negatively impact one’s quality of life and is often a big concern for patient’s families, given the issues with snoring, fatigue/EDS, and possible health consequences.
3. Nasal CPAP is the most widely used and effective treatment for OSA.
4. Many advances have been made in nasal CPAP technology that have made it much more usable than in the old days – including comfortable masks, quieter machines, built-in heated humidifiers, and different types of machines that make breathing easier.
5. It is perfectly normal to have concerns about being diagnosed with OSA, and to have reservations about treatment with nasal CPAP.
6. It will be important to get into the habit of discussing concerns about OSA and using nasal CPAP with the people providing care here at the sleep center.

#### D. Patient Questions/Open Dialogue

### III. Follow-up after diagnostic PSG – CBT by APP/MD

A. This encounter is typically scheduled soon after the diagnostic PSG. The clinician's focus should be on three main areas: providing the results of the PSG, including AHI, oxygen saturation data, and other relevant information (e.g., "dynamics" of OSA such as positional nature or stage-related, average length of respiratory event/longest event, cardiac arrhythmias, arousal index, other issues such as PLM's); discussing the need for treatment, including the "mortality data" related to untreated OSA; and treatment options, including or in many cases limited to nasal CPAP.

#### B. Key Questions

1. Now that you have heard the results of your PSG, how are you feeling?
2. What is your biggest concern about your OSA diagnosis at this point?
3. How convinced are you that treatment is essential?
4. Are you optimistic that nasal CPAP can be an effective treatment for your OSA?
5. What do you see as being the biggest drawback to using nasal CPAP?
6. What benefits of using nasal CPAP do you anticipate?
7. Do you have questions about how we proceed from here – the CPAP PSG, being set up on CPAP at home, or follow-up?

#### C. Information

1. If untreated, OSA can shorten the lifespan – not typically by sudden death during sleep, but usually by causing cardiovascular consequences long term.
2. It is upsetting for most people to hear that they stop breathing during sleep – fear and anxiety related to this is normal.
3. The good news is that OSA is an easily identified and very treatable disorder.
4. As previously discussed, successful treatment means benefits across the board (in terms of quality of life and health) in a relatively short amount of time – nasal CPAP can do that.
5. Patient job at this point is to be willing to try a *trial* of nasal CPAP.
6. After the CPAP titration PSG the patient will be set up on nasal CPAP at home. The patient will be seen for follow-up fairly quickly (usually within two to three weeks) to address any problems, to do some "fine-tuning" if necessary, and to

monitor overall progress. Many patients are already feeling better by this follow-up appointment.

7. If problems are encountered in the beginning, contact the sleep center immediately and avoid giving up – the large majority of problems in the beginning of a CPAP trial are fixable.

#### D. Patient Questions/Open Dialogue

### IV. CPAP titration PSG – CBT by RPSGT (Sleep Tech)<sup>1</sup>

A. This encounter will be conducted during the patient's "hook-up", and involves re-visiting the information covered in the video viewed by the patient prior to the diagnostic PSG. The tech may also facilitate discussion of the results of the patient's diagnostic PSG and the patient's feelings about his or her diagnosis and treatment with nasal CPAP.

#### B. Key Questions

1. Do you recall the video you watched before your first sleep study?
2. Thinking back on that video, do you have any questions about the information in it?
3. Would it be helpful to watch the video or the CPAP portion of the video again before your study tonight?
4. Do you feel you have a good understanding of how nasal CPAP works?
5. Would it be helpful for me to do a waking demonstration of nasal CPAP before we begin?
6. Do you have any questions about what is going to happen tonight?

#### C. Information

1. General information about how nasal CPAP works, the purpose of a CPAP titration study.
2. Treatment with nasal CPAP is an odd concept for many patients – having reservations, in addition to fear and anxiety about the CPAP titration, is to be expected in some cases.
3. It is very important for the patient to voice any concerns he or she may have going into the CPAP titration, and it is critical for the patient to let the tech know if he or she is having problems at any point before, during, or after the CPAP titration PSG.
4. After the CPAP PSG, the sleep doctor will review the study, see what pressure and specifications looked best, and then

---

<sup>1</sup> Some sleep centers may choose to do split-night diagnostic and CPAP PSG's, based on varying criteria. If a split-night PSG is possible, the sleep center may opt to incorporate this module into module II, conducted by the sleep tech prior to the diagnostic PSG.



the patient will be contacted to be set up on nasal CPAP through the sleep center.

5. The sleep center will follow the patient closely, especially in the beginning, to help the patient adjust and to be sure the patient has everything he or she needs.

#### D. Patient Questions/Open Dialogue

### V. CPAP set-up at sleep center – CBT by RT/DME Staff

- A. This encounter is to be conducted in the sleep center as part of Sleep Centers of Middle Tennessee's model of delivery of durable medical equipment (DME) services. Ideally the CPAP set-up should take place within a day or two following the CPAP titration PSG.

#### B. Key Questions

1. Since having your CPAP sleep study, have you had any concerns about using nasal CPAP at home?
2. Do you understand all of the information that has been passed on to you so far regarding your diagnosis and your need for treatment with nasal CPAP?
3. What are your expectations about treatment with CPAP?
4. Are there any problems you would anticipate using nasal CPAP?
5. As a result of using nasal CPAP on a nightly basis, you can look forward to many benefits – what benefit are you most looking forward to?
6. How do you think you will do with nasal CPAP?

#### C. Information

1. The patient should be encouraged for making it through the first step in the process of being set-up on nasal CPAP – the CPAP titration PSG.
2. The CPAP titration PSG may not necessarily be an indication of how well the patient will tolerate nasal CPAP at home – many patients who do not sleep well in the sleep laboratory during their CPAP titration eventually do well at home.
3. General information about using nasal CPAP, familiarization with the equipment, and equipment care/maintenance.
4. Waking demonstration of nasal CPAP, if the patient thinks this will be helpful.
5. Importance of nightly adherence to the prescribed CPAP regimen – the benefits of use of nasal CPAP can only be obtained if CPAP is used regularly.
6. Progress will be monitored at the scheduled CPAP follow-up, but patients should call with any needs they may have prior to that appointment.

7. General information about the delivery of DME services through Sleep Centers of Middle Tennessee – including when and how to update supplies.
8. Contact information should be given for the respiratory therapist setting the patient up.

D. Patient Questions/Open Dialogue

**Interlude - early identification and intervention for non-adherent patients**

- A. Conducted via web-based monitoring
- B. Patient to be contacted by sleep center staff regarding poor treatment adherence
  1. Reiterate the importance of adherence to nasal CPAP treatment
  2. Provide support and encouragement
  3. Avoid “shaming” the patient for not being adherent
  4. Validate of the patient’s frustration, where appropriate
  5. Schedule earlier follow-up appointment in the sleep clinic, if troubleshooting and problem resolution cannot be accomplished over the telephone
- C. Increase long-term adherence by proactively providing solutions, support, and empathy during the beginning phases of nasal CPAP use

**VI. Follow-up after CPAP PSG/Physician exit interview – CBT by APP/MD<sup>2</sup>**

- A. This encounter is typically scheduled within two to three weeks after the CPAP titration PSG, by which time the patient has usually had a minimum of three weeks of time at home using nasal CPAP. The clinician’s focus should be on three main areas: to review the results of the CPAP titration study; to compare the patient’s sleep in the laboratory on nasal CPAP to his or her sleep the diagnostic study (i.e., AHI, oxygen saturation data, arousal index); and to provide encouragement that nasal CPAP appears to be an effective treatment for the patient’s OSA.
- B. Key Questions
  1. What did you think of your CPAP titration study?
  2. Were there difficulties you encountered in the laboratory as you were titrated on nasal CPAP?
  3. How did you feel on the morning after your CPAP sleep study?
  4. Since being set up on nasal CPAP, have you been able to use your equipment each night, throughout the night?
  5. How many hours are you using nasal CPAP per night?

---

<sup>2</sup> In the case of Sleep Centers conducting split-night diagnostic and CPAP PSG’s, this module may be incorporated into module III, conducted by the sleep physician after the diagnostic PSG.

6. Have you had any mask or equipment problems since being set up?
7. Any difficulty exhaling against the CPAP pressure?
8. Since starting nasal CPAP, have you had any dryness in your nose, throat, or mouth when you wake up in the morning? [If yes, "Are you using the humidifier attachment?"]
9. Has your snoring been resolved on nasal CPAP?
10. How do you feel in terms of fatigue and/or EDS compared to when you first came to see us for consultation?
11. Any other benefits you have noticed since starting nasal CPAP (e.g., improvements in reflux, nocturia, headaches, dry mouth, mood)?
12. How do you feel about using nasal CPAP as a long-term treatment option for your OSA?

### C. Information

1. Getting started on nasal CPAP at home is a big accomplishment.
2. The problems experienced by patients who are new to using nasal CPAP are often easily resolved with some troubleshooting techniques.
3. Review adherence data obtained via download.
4. Employ techniques to improve adherence as applicable:
  - a. Sleep education
  - b. Sleep hygiene
  - c. Stimulus control
  - d. Sleep period restriction
  - e. Relaxation training (see Appendix I)
  - f. Anecdotal information, based on other patients' experiences of "what works"
5. Discuss the importance of treatment adherence, and stress to the patient the fact that adherence will be closely monitored.
6. The benefits of adherence to nasal CPAP treatment may already be evident but will continue to surface over time.
7. One example is EDS/fatigue. Many patients with OSA have accumulated a "sleep debt" - this debt is paid off over time (may vary from patient to patient) and the ultimate return is elimination of or marked reduction in EDS/fatigue.
8. The patient may also begin to see increased health benefits over time.
9. Once patients have begun using nasal CPAP at home, and once all of the "fine-tuning" is completed, the difficult part is over – time to enjoy the benefits.

### D. Patient Questions/Open Dialogue

## References

Aloia, M., Arnedt, J.T., Riggs, R., Hecht, J., & Borelli, B. (2004). Clinical management of poor adherence to CPAP: Motivational enhancement. *Behavioral Sleep Medicine, 2*, 205-222.

Aloia, M., Arnedt, J.T., & Stepnowski, C. (2005). Predicting treatment adherence in obstructive sleep apnea using principles of behavior change. *Journal of Clinical Sleep Medicine 2005, 1*, 346-353.

Miller, W.R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change (2<sup>nd</sup> edition)*. New York: Guilford.

Richards, D., Bartlett, D.J., Wong, K., Malouff, J., & Grunstein, R.R. (2007). Increased adherence to CPAP with a group cognitive behavioral treatment intervention: A randomized trial. *Sleep, 30*, 635-647.

Weaver, T. (2005). Predicting adherence to continuous positive airway pressure: The role of patient perception. *Journal of Clinical Sleep Medicine, 1*, 354-356.

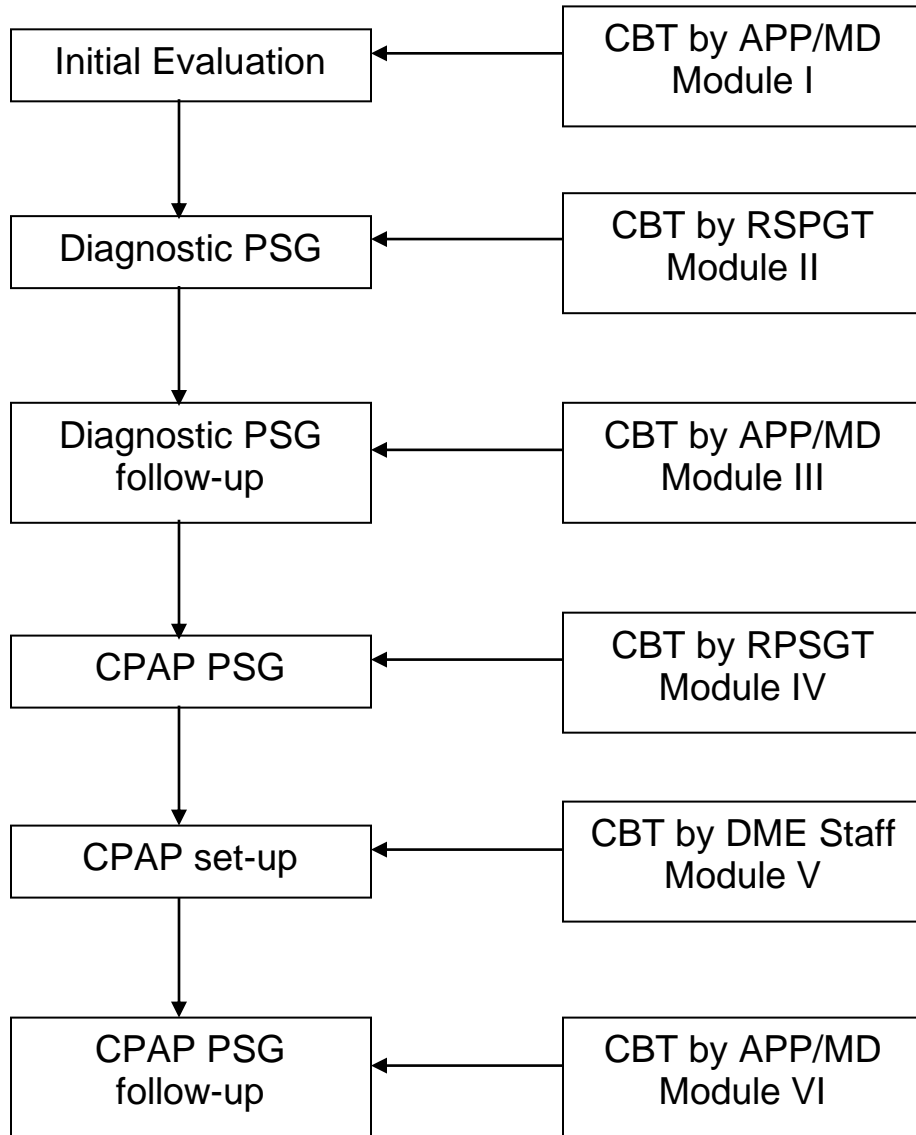
## Sleep Centers of Middle Tennessee: Improving CPAP Treatment Adherence via Cognitive Behavioral Therapy (CBT)

Table 1. Key concepts of motivational interviewing (MI), and their application to patients with OSA (adapted from Aloia et al, 2004).

Key Concept	Definition	Possible Clinician Responses
1) Develop discrepancy	The clinician attempts to point out a discrepancy between the current maladaptive behavior and the patient's self-identified goals and values. The patient's recognition that the behavior is hindering goal attainment or is not consistent with values increase negative affect (e.g., anxiety). Motivation to reduce the negative affect (e.g., anxiety) becomes the impetus for change.	"You said that losing weight, not using CPAP, is the most important goal for you right now. You also said that you can't seem to exercise because you are tired all of the time. I'm wondering, do you thing there is a connection between using CPAP and losing weight? How can CPAP facilitate weight loss? Can it hinder weight loss?"
2) Express empathy	Change does not come from making a person feel bad about his or her behavior. It is important to create a supportive, patient-centered atmosphere where the patient feels comfortable exploring conflicts about change.	"You seem to have a lot on your plate right now. You feel that using CPAP adds additional stress."
3) Avoid argumentation and accept ambivalence	The clinician's argumentation for change will, paradoxically, decrease the likelihood of change. The ambivalent patient will naturally want to assert his or her autonomy and argue the opposite side of ambivalence, especially in the context of not feeling in control of his or her health.	<p>PATIENT: "I don't believe this feedback. I don't believe my OSA is that bad."</p> <p>NON-MI CLINICIAN: "The test results are accurate and were obtained with state of the art equipment."</p> <p>MI CLINICIAN: "Your OSA hasn't caused you any problems."</p>
4) Roll with resistance	It is important to support the patient's autonomy by emphasizing that it is his or her choice as to whether he or she wants to change.	"As your healthcare practitioner, I recommend that you use CPAP all night every night to achieve the best results; however, the decision to do this is entirely up to you."
5) Support self-efficacy	Self-efficacy is the patient's perceived ability for change in a particular are. Self-efficacy can be augmented by optimistic statements by the clinician about the patient's ability to change, setting small but achievable goals, and by discussing how the achievement of goals was due to the patient's efforts.	<p>"I know you can do this."</p> <p>"It sounds like you are concerned because you have tried to use CPAP before and had trouble. It sounds like it's really important to you, since you keep persisting."</p> <p>"Most people take awhile to adjust to CPAP and build the use of the CPAP equipment in to their daily lives."</p>

# Sleep Centers of Middle Tennessee: Improving CPAP Treatment Adherence via Cognitive Behavioral Therapy (CBT)

Figure 1. Clinical pathway for administration of CBT modules.



## Sleep Centers of Middle Tennessee: Improving CPAP Treatment Adherence via Cognitive Behavioral Therapy (CBT)

Appendix 1. Relaxation training (first induction to be completed in sleep clinic).

### RELAXATION TRAINING Muscle Relaxation with Deep Breathing

*This exercise combines muscle relaxation and deep breathing.* Keep this exercise in front of you and use it to practice at first. Find a comfortable place, such as an easy chair.

*First, let's practice diaphragmatic breathing.* Take a deep breath in through your nose, filling your lungs, and exhale through your lips. Take ten deep breaths using that technique.

*Now, we'll focus on specific areas of your body.* For each of these areas, the general rule will be to 1) inhale, 2) tense the muscle groups in that particular area, 3) hold the tension for a count of three (one-one-thousand, two-one-thousand, three-one-thousand), and 4) exhale, while thinking the word RELAX. Feel the tension flow out of your muscles as you exhale.

*There are many different ways to "group" the muscles. The following groups are but one of the many potential ways:*

***Forehead and face:*** Focus first on your jaw muscles, tense your jaw muscles by gritting your teeth (not too hard!). Next, move to your cheek muscles...tense these muscles by making an exaggerated smile. Feel the muscles "knot up" as you tense them, with this tension releasing as you relax and exhale. Now move to your forehead - tense your forehead muscles by raising your eyebrows as high as you can. Then feel the tension in your forehead release as you relax and exhale.

***Shoulders and arms:*** First, start with tensing your forearms by making fists with your hands and turning your fists inward as far as you can. Next, move to your biceps and triceps...with your elbows bent, tense your biceps and triceps. Finally, tense your shoulders by lifting them toward your ears



as high as you can. Feel the tension release as you relax your shoulder muscles and exhale.

***Chest and abdomen:*** Tense your chest muscles by pushing your shoulders toward the ground as firmly as possible. Now move to your abdominal muscles, and tense them by pulling your stomach in. Feel the tension flow out of your abdominal muscles as you relax them and exhale.

***Legs and feet:*** Start with your thighs...tense them by lifting your feet off of the ground and extending your legs straight out and locking your knees. Now move to your calf muscles, and tense them by lifting your toes toward the ceiling as far as you can. Feel the tension leave through the end of your toes as you relax your calf muscles and exhale. Finally, tense your foot muscles by curling your toes toward the ground and holding them inward as tightly as possible. As you relax your feet and exhale, again feel the tension leave through the end of your toes.

***Now, take ten deep breaths and focus on how relaxed your muscles feel.*** Really focus on your body, and notice how relaxed it is. You may notice that any remaining tension is flowing out each time you exhale. Remember to continue to think the word RELAX as you exhale. If you notice any residual tension in particular area, you may re-visit that area and tense and relax the muscles again. After you have taken ten deep breaths and gotten rid of any residual tension, open your eyes and take a moment to get your bearings. If you have done this thoroughly, you probably feel very relaxed and may be a little unsteady on your feet.

**IMPORTANT:** You may use these techniques at home, at work, or virtually any quiet place you can find when you're stressed. You may also use the DEEP BREATHING TECHNIQUES alone if you need a quick and easy way to relax. If you get in the habit of practicing relaxation techniques, you will eventually train your body to relax by taking a few deep diaphragmatic breaths and thinking the word RELAX.