CHAPTER 1

Promoting Healthy Sleep

> Sleep is that golden chain that ties health and our bodies together.
>
> —THOMAS DEKKER (1572–1632)

The Goodness of Sleep

Over the past 5 decades an avalanche of discoveries has documented the benefits of healthy sleep and the functioning of the 24-hour (circadian) clock. Healthy sleep and circadian functioning improve every aspect of our lives. Emotionally we are better regulated, happier, and less prone to developing mental illness. Cognitively we are more attentive, learn more effectively, remember more completely, and think more creatively. Physically we regulate our body weight more easily, increase our activity level, clear toxic brain molecules more thoroughly, and show improved immune system functioning. Healthy sleep and circadian rhythms are associated with a lower incidence of depression, Alzheimer's disease, diabetes, cardiovascular disease, and even of the common cold. A good night's sleep allows us to stay alert and function well at work and in our social and family lives, and to remain more motivated and more likely to achieve our personal goals. It also helps with daily routines, such as driving more safely. Finally, healthy sleep and circadian functioning are linked to reduced mortality risk—meaning that good sleepers live better *and* longer lives. Clearly, there are compelling reasons to place a high priority on establishing healthy sleep and circadian function patterns. Promoting optimal sleep health is an often-overlooked pathway toward optimizing mental and physical health.

The Sleep Health Framework

The goal of this book is to describe a novel treatment approach, the Transdiagnostic Sleep and Circadian Intervention (TranS-C), which we propose as a pathway to promote *sleep health*. The sleep health framework (Buysse, 2014) underlies and guides TranS-C. Within this framework, the pathway to improving sleep health involves identifying and treating sleep disorders, such as insomnia, and circadian rhythm disorders, such as advanced or delayed sleep-phase problems. There is robust evidence showing that these disorders are associated with a broad range of negative emotional and health outcomes. However, the sleep health framework encourages us to go much further. Indeed, healthy sleep and circadian functioning is much more than the absence of sleep disorders. The goal of promoting sleep health is to optimize clients' ability to truly become "good sleepers."

The sleep health framework represents a shift from the typical sleep medicine perspective, which emphasizes the identification and treatment of sleep disorders, to a *health promotion* perspective, which emphasizes universal attributes of sleep that can be optimized to promote well-being. The approach is informed by four perspectives on sleep and health: (1) the *medical model,* which emphasizes the treatment of sleep disorders; (2) the approach taken by the World Health Organization, which encompasses *health and well-being* in physical, mental, and social domains; (3) *wellness* and role performance models, which encourage the integration of body, mind, and spirit; and (4) models that incorporate the importance of an individual being able to adapt to challenges in the physical and social *environment*. Based on these perspectives, we propose the following definition of sleep health:

> Sleep health is a multidimensional pattern of sleep-wakefulness, adapted to individual, social, and environmental demands, that promotes physical and mental well-being. Good sleep health is characterized by subjective satisfaction, appropriate timing, adequate duration, high efficiency, and sustained alertness during waking hours. (Buysse, 2014, p. 12)

More recent research has also led us to emphasize the regularity of sleep–wake patterns since regularity in itself is associated with better health outcomes. Thus, the framework encourages clinicians to work toward improving client's sleep along six dimensions:

- Dimension 1: **R**eg**u**larity. This dimension refers to going to sleep and waking up at about the same times.
- Dimension 2: **S**atisfaction with sleep or sleep quality. This dimension

refers to the subjective assessment of "good" or "poor" sleep made by the client.

- Dimension 3: **A**lertness during waking hours. This dimension is focused on the client's ability to maintain attentive wakefulness during the daytime and not to experience unwanted daytime sleepiness.
- Dimension 4: **T**iming. This dimension refers to the placement of the client's sleep within the 24-hour day.
- Dimension 5: Sleep **E**fficiency. This dimension refers to the ability to sleep for a large percentage of the time in bed, as indicated by the ease of falling asleep at the beginning of the night and the ease of returning to sleep after awakenings during the night.
- Dimension 6: Sleep **D**uration. This dimension refers to the total amount of sleep obtained by the client over 24 hours.

These dimensions can be easily remembered with the relevant acronym RU SATED—that is, has your sleep "filled up" your emotional, cognitive, and physical need to sleep? These dimensions can be assessed on a continuum and for four of them, a *higher score is better*. However, for dimensions 4 and 6, sleep timing and healthy sleep duration, we seek a middle road. Sleep duration that is either too long or too short and sleep timing that is too early or too late may be associated with negative health outcomes. All of these dimensions can be quantified by self-report measures, such as the retrospective questionnaires and sleep diary discussed in Chapter 2. These dimensions can also be measured behaviorally (actigraphy) and physiologically (polysomnography). However, actigraphy and polysomnography are not often required in clinical practice. Finally, there is a sound empirical basis for each of the six dimensions as reviewed in detail in Buysse (2014) and briefly described here.

- *Regularity* in sleep and wake times is a relatively new focus of research (Bei, Wiley, Trinder, & Manber, 2016). Irregularity has already been associated with poor school performance, insomnia, bipolar disorder, circadian rhythm disorders, negative health outcomes, and obesity.
- *Satisfaction with sleep.* Lack of sleep satisfaction, a hallmark of insomnia, is associated with metabolic syndrome, diabetes, hypertension, coronary heart disease, and depression.
- *Alertness during waking hours.* The opposite of alertness, daytime sleepiness, is associated with increased mortality risk, coronary heart disease, and impaired neurobehavioral performance.
- *Timing of sleep.* Research done on shift work and "chronotype"—our preference for early or late bedtimes—has found that sleep taken at very

early or very late times is associated with increased mortality risk, coronary heart disease, metabolic syndrome, diabetes, and accidents.
- *Sleep efficiency.* Poor sleep efficiency has been associated with increased mortality risk, coronary heart disease, metabolic syndrome, hypertension, and depression.
- *Sleep duration* that is too short or too long has been associated with mortality, obesity, metabolic syndrome, diabetes, hypertension, coronary heart disease, and impaired neurobehavioral performance.

Around 20% of adults in the general population meet the criteria for insomnia. Comorbidity between psychiatric disorders and insomnia is estimated to fall between 41 and 53% (e.g., Benca, Obermeyer, Thisted, & Gillin, 1992; Breslau, Roth, Rosenthal, & Andreski, 1996; Buysse et al., 1994; Ford & Kamerow, 1989). If the estimates for insomnia are combined with the estimates for other common sleep problems, such as delayed and advanced sleep phase disorder and hypersomnia (e.g., Gradisar, Gardner, & Dohnt, 2011; Liu et al., 2007), a large segment of the population is affected, with high personal and societal costs (Daley, Morin, LeBlanc, Gregoire, & Savard, 2009; Hillman, Murphy, & Pezzullo, 2006; Ozminkowski, Wang, & Walsh, 2007; Roth et al., 2006). If we add another large segment of the population who don't meet formal diagnostic criteria for a sleep disorder but who fall short on one or more of the six dimensions of sleep health to this group, then clearly there are a huge number of people who would benefit from a sleep treatment.

To summarize, TranS-C aims to go beyond ameliorating categorically defined sleep and circadian disorders to facilitating clients' ability to achieve the definition of good sleep health offered earlier. The goal of TranS-C is to help the client optimize each of the six sleep health dimensions.

Key Principles of TranS-C

A Transdiagnostic Approach

At the core of TranS-C is a relatively new approach, namely, targeting research and treatment at "transdiagnostic processes," which are defined as clinical features that are common to more than one mental illness (Barlow, Allen, & Choate, 2004; Fairburn, Cooper, & Shafran, 2003; Harvey, Watkins, Mansell, & Shafran, 2004).

Sleep and circadian dysfunction is a biologically (Harvey, Murray, Chandler, & Soehner, 2011) and theoretically (Harvey, 2008) plausible *transdiagnostic* contributor to mental illness. Indeed, sleep and circadian problems not only coexist with mental disorders but mounting scientific evidence

indicates that sleep and circadian problems are important causal or mechanistic contributors to mental disorders (e.g., Harvey, 2008). Also, the majority of studies within the sleep field are disorder focused—that is, they tend to treat a specific sleep problem (e.g., insomnia). In contrast, real life sleep and circadian problems are not so neatly categorized. Indeed, insomnia can overlap with features of hypersomnia (Kaplan & Harvey, 2009) and circadian rhythm disorders, such as delayed sleep phase (Giglio et al., 2010; Sivertsen et al., 2013) and irregular sleep–wake schedules (Gruber et al., 2009).

A systematic review (Taylor & Pruiksma, 2014) and a meta-analysis (Wu, Appleman, Salazar, & Ong, 2015) of research on sleep treatments for a range of mental disorders have been published. As just noted, typically these studies have been disorder focused in that they have treated insomnia using cognitive-behavioral therapy for insomnia (CBT-I) in one mental illness. Interestingly, the review concluded that treating sleep problems occurring in depression, anxiety, and posttraumatic stress disorder improves not just the sleep problem but also the comorbid condition. Moreover, a similar pattern of findings has been reported for schizophrenia (Freeman et al., 2015). Even more strikingly, this pattern of findings is not specific to mental illness. Wu et al. (2015) showed a similar pattern of effects across a range of medical disorders including chronic pain, renal disease, cancer, and fibromyalgia, and even two sleep disorders: periodic limb movement disorder and obstructive sleep apnea. Although the effect size for insomnia treatment in medical disorders was smaller than that for mental disorders, the general principle held true—treating sleep problems improves outcomes for comorbid disorders. In short, there are multiple demonstrations that a time-limited sleep treatment is helpful for people who also have a range of mental and physical illnesses, adding to the likely benefit of treating sleep transdiagnostically.

The transdiagnostic approach has several advantages (Harvey et al., 2004). First, if a transdiagnostic process contributes to the maintenance of symptoms across multiple disorders, then focusing treatment on the transdiagnostic process may be the most efficient approach. Second, many clients meet the diagnostic criteria for more than one mental illness, and in deciding which disorder to prioritize for treatment perhaps we could target treatment at one or more transdiagnostic processes. Relatedly, one account of comorbidity is that the clinical and biological boundaries among mental disorders may not be so distinct (Brown & Barlow, 1992). Thus, basing diagnosis and treatment on clinical signs and symptoms may be imprecise. Third, clinicians who are challenged with learning multiple disorder-focused protocols face a heavy burden. Often these protocols have common theoretical underpinnings and even use similar interventions. As such, the transdiagnostic approach may help to address the "too many empirically supported treatments problem" (Weisz, Ng,

& Bearman, 2014, p. 68). TranS-C provides a robust transdiagnostic treatment *framework* that applies to clients with a wide range of mental disorders. The rationale for TranS-C, along with key features described later in this chapter, is summarized in Box 1.1.

The Two-Process Model of Sleep

One of the most widely cited and heuristically useful theories in the sleep field is the two-process model (Borbely & Wirz-Justice, 1982), which is central to TranS-C. This model describes two basic physiological processes that govern the sleep–wake cycle: a circadian process and a homeostatic process.

The *circadian process* is the unfolding of the sleep and wake rhythm across a 24-hour period. It is driven by the "master clock"—the suprachiasmatic nuclei (SCN), which are located within the hypothalamus of the brain

BOX 1.1. TranS-C Rationale and Key Characteristics

- Sleep and circadian problems are common and are often associated with mental and physical disorders.
- Sleep and circadian problems are important causal or mechanistic contributors to mental disorders.
- Sleep and circadian problems can occur even in the absence of a specific sleep disorder.
- There is evidence that behavioral and psychological interventions can be used to improve sleep health across a wide range of disorders.
- Most treatment research and the current treatment approaches are focused on insomnia, yet real-life sleep problems are complex and often include other clinical features, such as hypersomnia, delayed ("owls") or advanced ("larks") sleep timing, and irregular sleep–wake schedules.
- TranS-C is transportable and useful to front-line providers working in a broad range of settings.
- TranS-C is empirically derived and draws from existing evidence-based treatments.
- TranS-C helps solve the "too many empirically supported treatments problem" (Weisz et al., 2014, p. 68).
- TranS-C can be personalized to each client's sleep problems.
- TranS-C is relevant to a range of sleep problems across a range of mental disorders.

(Reppert & Weaver, 2002). The SCN have an internal, or endogenous, rhythm that runs close to 24 hours even in the absence of any time cues from the environment. The process by which the master clock synchronizes to the 24-hour day is called *entrainment*. Entrainment occurs via *zeitgebers,* the German word for "time givers." The primary zeitgeber for the circadian process is the daily alteration of light and dark (Roennebert & Foster, 1997). In other words, our exposure to light and dark during the day and night has a major influence on the circadian rhythm in our SCN. Hence, TranS-C incorporates timed light and dark exposure, as we will discuss in detail later. Circadian rhythms can be measured in almost every physiological function, including hormone rhythms, blood pressure, body temperature—and the propensity for sleep. Moreover, circadian rhythms also govern our cognitive, mental, and emotional processes.

Interestingly, evidence from human and animal studies show that the SCN is entrained not only by light, but by other types of zeitgebers, such as arousal, activity, social time, meals, sleep deprivation, and temperature (Mistlberger, Antle, Glass, & Miller, 2000). Hence, TranS-C includes a focus on regularizing the daily sleep–wake rhythm in these nonphotic cues. Again, we will describe the details of the treatment approach later.

If the circadian process is like a clock, the *homeostatic process* is more like an hourglass. Our brain keeps track of the time elapsed since waking, increasing our drive for sleep the longer we are awake. More specifically, the homeostatic pressure to sleep increases during the time we are awake and dissipates during sleep (Jenni, Achermann, & Carskadon, 2005; Taylor, Jenni, Acebo, & Carskadon, 2005). Hence, TranS-C includes interventions for increasing the homeostatic drive to sleep. When we talk about this second process with clients, it is often helpful to refer to the homeostatic process as the "hunger," "drive," or "appetite" for sleep. Homeostatic sleep drive can also be likened to a rubber band: the longer you stretch it, the more powerfully it snaps back.

In addition to incorporating the two-process model of sleep regulation, TranS-C also incorporates three empirically supported treatments to optimize sleep as well as the functioning of, and interaction between, the circadian and homeostatic processes.

Cognitive-Behavioral Therapy for Insomnia

CBT-I is a multicomponent treatment that typically comprises and incorporates one or more of the following interventions: stimulus control, sleep restriction, sleep education, relaxation therapy, and cognitive restructuring for unhelpful beliefs about sleep (Morin & Espie, 2003; Perlis, Smith, Jungquist, & Posner, 2005). Robust evidence supporting the efficacy of CBT-I comes from multiple meta-analyses (Irwin, Cole, & Nicassio, 2006; Morin, Culbert, & Schwartz,

1994; Murtagh & Greenwood, 1995; Smith et al., 2002) and systematic reviews of CBT-I in adults (Morin et al., 2006; Qaseem, Kansagara, Forciea, Cooke, & Denberg, 2016). As we have reviewed elsewhere (Harvey, 2016), the evidence for CBT-I among adolescents is limited but very promising (Bootzin & Stevens, 2005; Cassoff, Knäuper, Michaelsen, & Gruber, 2013; de Bruin, Oort, Bögels, & Meijer, 2014; Gradisar, Dohnt, et al., 2011; Paine & Gradisar, 2011; Schlarb, Liddle, & Hautzinger, 2010). This strong evidence base justified including CBT-I in TranS-C. In particular, TranS-C draws on the CBT-I components that increase homeostatic pressure to sleep and that reinforce entrainment by regular wake-up times (stimulus control and sleep restriction) and reduced arousal (cognitive therapy). In other words, TranS-C utilizes behavioral strategies to improve sleep that draw upon the two-process model of sleep regulation.

Behavioral Treatment of Circadian Rhythm Sleep–Wake Disorder, Delayed Sleep Phase Type

An evening circadian tendency refers to people who follow a delayed sleep schedule ("night owls"); they increase activity later in the day, and both go to sleep and wake up later. This broader spectrum of *eveningness* is very common, and its extreme end is represented by circadian rhythm sleep–wake disorder, delayed sleep phase type (DSPT; Lovato, Gradisar, Short, Dohnt, & Micic, 2013). DSPT is defined by sleep complaints that result from misalignment between the sleep–wake rhythm of the client and the sleep–wake schedule required by the environment. The sleep complaints of DSPT may include not being able to fall asleep until the early hours in the morning, sleeping into the next day, and being unable to sleep at "socially normal" times (American Psychiatric Association, 2013).

To address the extreme end of delayed sleep as well as the broader spectrum, TranS-C draws on research on DSPT (Gradisar, Dohnt, et al., 2011; Gradisar, Smits, & Bjorvatn, 2014; Okawa, Uchiyama, Ozaki, Shibui, & Ichikawa, 1998; Regestein & Monk, 1995), including practice parameters (Sack et al., 2007) that review positive evidence for timed light exposure (with a light box), reduced light in the evening, and planned, regular sleep schedules (chronotherapy) in adults. TranS-C includes the latter two interventions, with two important adaptations. First, many people are not motivated to use a light box, and purchasing a light box involves some additional expense. Hence, TranS-C aims to help clients develop lifelong habits of natural morning light exposure and evening dim light through electronic curfews. Second, traditional phase-delay chronotherapy involves progressively delaying bedtimes and wake times until the desired alignment is reached. Unfortunately, this type of treatment is highly disruptive to family and work schedules. Therefore, in TranS-C we often adopt a

protocol that involves setting bedtimes earlier by 20–30 minutes per week. This slower approach is based on our clinical experience and the realization that our circadian system adapts more slowly to earlier bedtimes than to later ones. We have found this schedule to be achievable and a source of accomplishment and mastery for the client, which further increases the motivation for change. However, more research is needed to establish the ideal sleep modification for various groups of clients that balances circadian and motivational processes.

Interpersonal and Social Rhythm Therapy

Interpersonal and social rhythm therapy (IPSRT) is a treatment approach derived from the "social zeitgeber" theory of depression. This theory hypothesizes that life stresses disrupt our daily and social rhythms, which can lead to pathological entrainment of our circadian system. Given that moods are regulated in part by circadian processes, pathological entrainment can, in vulnerable individuals, lead to depression or other mood episodes (Ehlers, Frank, & Kupfer, 1988). IPSRT includes strategies that are designed to develop and maintain stability in social rhythms, and that draw from both human and animal research showing that the sleep and circadian systems are surprisingly sensitive to nonphotic cues, including physical activity, feeding times, and social interaction. IPSRT emphasizes stabilizing these daily rhythms to help stabilize the sleep–wake schedule. A robust evidence base for stabilizing circadian rhythms with IPSRT in bipolar disorder and depression has developed (Frank et al., 2005; Hlastala, Kotler, McClellan, & McCauley, 2010; Miklowitz et al., 2007).

Many people have irregular social and personal schedules and irregular sleep–wake cycles. In particular, adolescents and young adults wake early on weekdays for school, college, or work and then sleep in on weekends (Hysing, Pallesen, Stormark, Lundervold, & Sivertsen, 2013). Many adults, particularly those who are not working, develop habits of irregular bedtimes and wake times. Irregular sleep schedules can result in a chronically "jet-lagged" or poorly entrained state to which the human circadian system cannot adjust. Accordingly, TranS-C includes aspects of IPSRT designed to stabilize sleep and wake rhythms, as well as other social rhythms (e.g., mealtimes, socializing, exercising, etc.), drawing from the treatment manual developed by Ellen Frank (2005).

TranS-C also borrows from evidence-based approaches to treating nightmares and sleep apnea and improving motivation to change. Specifically, the module for nightmares employs imagery rehearsal therapy and is based on research by Barry Krakow, Anne Germain, and their colleagues (Germain, Shear, Hall, & Buysse, 2007; Krakow et al., 2001). The module for promoting adherence to treatments for sleep apnea is derived from evidence-based approaches (Aloia et al., 2007; Bartlett, 2011a, 2011b; Means & Edinger, 2011).

Motivational interviewing (MI) tools are used throughout (Miller & Rollnick, 2013).

A Modular Treatment

We adopted a modularized approach for TranS-C for several reasons, the most important of which is that not all clients experience all types of sleep problems. We designed a modular format consisting of core and optional modules that allow the treatment sessions to be focused on the specific sleep problem experienced by each client. The modular format proved to be more time efficient and focused on each individual client's presenting problem. We were influenced in part by the work of John Weisz, Bruce Chorpita, and their colleagues in a different field, who tested the modular approach to therapy for children with anxiety, depression, or conduct problems (MATCH; e.g., Weisz et al., 2012). They randomly assigned community clinicians to deliver usual care, standard manualized disorder-focused treatment (i.e., CBT for depression, CBT for anxiety, and behavioral parent training for conduct problems) or a modular treatment that integrated the procedures from the three separate standard treatments. MATCH was associated with the best outcomes in the form of steeper trajectories of improvement and more sustained improvement relative to both usual care and to standard manualized disorder-focused treatment (Park et al., 2016; Weisz et al., 2012). Two other findings from this research program are striking. First, therapist attitudes to evidence-based treatment were more positive following the training in the modular protocol relative to the standard protocol (Borntrager, Chorpita, Higa-McMillan, & Weisz, 2009). Second, after treating cases with the modular protocol, standard protocol, and usual care, 77 therapists reported that they were more satisfied with the modular treatment, relative to the standard treatment and usual care (Chorpita et al., 2015). In summary, we felt there were excellent reasons to adopt a modular approach for TranS-C, particularly given that our goal was to develop an approach that maximizes transportability and usefulness to front-line providers.

An Overview of TranS-C

As summarized in Box 1.2, and described in the sections that follow, TranS-C consists of three sets of modules: four cross-cutting modules, four core modules, and seven optional modules. The sessions last 50 minutes and 4 to 10 sessions are typically sufficient depending on the complexity of the presentation and the number of modules to be delivered.

BOX 1.2. TranS-C Modules

Cross-cutting modules (introduced in Sessions 1–3 and featured in all sessions thereafter)	Module topics in the TranS-C intervention	Treatment module
Case Formulation; Education; Behavior Change and Motivation; Goal Setting	Establishing regular sleep–wake times	Core Module 1, Part A
	Learning a wind-down routine	Core Module 1, Part B
	Learning a wake-up routine	Core Module 1, Part C
	Improving daytime functioning	Core Module 2
	Correcting unhelpful sleep-related beliefs	Core Module 3
	Improving sleep efficiency	Optional Module 1
	Reducing time in bed	Optional Module 2
	Dealing with delayed or advanced phase	Optional Module 3
	Reducing sleep-related worry and vigilance	Optional Module 4
	Promoting compliance with the CPAP machine/exposure therapy for claustrophobic reactions	Optional Module 5
	Negotiating sleep in a complicated environment	Optional Module 6
	Reducing nightmares	Optional Module 7
	Maintenance of behavior change	Core Module 4

Cross-Cutting Modules

TranS-C includes four cross-cutting modules: Case Formulation, Sleep and Circadian Education, Behavior Change and Motivation, and Goal Setting. These are *typically* introduced in Sessions 1–3. Thereafter they become *rolling interventions* woven into every subsequent session, as described in the next sections.

Cross-Cutting Module 1: Case Formulation

Judith Beck (2011) reminds us of the value of an "ever evolving formulation," which unfolds throughout all sessions. The initial case formulation in TranS-C is based on at least a week of completed sleep diaries along with the measures described in Chapter 2 and the functional analysis described in Chapter 3. In each subsequent session, a new week's sleep diary is collected and more information about the client's sleep and circadian functioning becomes apparent as the various interventions are implemented. This new information can change or improve the accuracy of the formulation and treatment goals discussed in early treatment sessions.

Cross-Cutting Module 2: Sleep and Circadian Education

Sleep and circadian education lays the scientific foundation for the interventions that comprise TranS-C. If a client understands the science behind a recommendation, he or she is much more likely to try it. For example, many people enjoy using technology before bedtime. One client with a severe mental illness, who lives in a board and care home, described her TV as "my only friend." She slept with the TV on all night. It was positioned next to her bed, near her pillow. However, this client was willing to try turning the TV off when she learned that bright light and intermittent noise interfere with the biology of sleep. Sleep and circadian education becomes a "rolling intervention" in two ways: (1) most of the core and optional modules include an education component that provides an opportunity to review and extend the information covered in this early phase of treatment, and (2) it is important to provide regular reminders of the sleep and circadian education as they help the client recall the rationale for each intervention. For example, a client may note that, surprisingly, she slept better after needing to get up early for an appointment that morning. This could be pointed out to her as an example of increased homeostatic sleep drive from waking earlier, contributing to better sleep the following night.

Cross-Cutting Module 3: Behavior Change and Motivation

Facilitating the client's adoption of healthy sleep habits is difficult. Behavior change is challenging for everyone, not just for those who have sleep problems. For example, if you made a New Year's resolution, do you remember what the resolution is? Have you achieved it? Most New Year's resolutions are forgotten. MI and related behavior change strategies should be reflexively folded into every session, particularly when homework for the coming week is being planned.

Cross-Cutting Module 4: Goal Setting

Client sleep goals provide a focus for treatment and for monitoring progress. Goals are set for both the night and the day. The daytime goals are important given that daytime impairment is an essential feature of sleep problems (American Academy of Sleep Medicine, 2005; American Psychiatric Association, 2013; Edinger, Bonnet, et al., 2004). Therapy goals are set in the early sessions of TranS-C, but they may need to be reevaluated and readjusted periodically as the intervention unfolds.

Core Modules

TranS-C also includes four core modules that apply to the vast majority of clients.

Core Module 1: Establishing Regular Sleep–Wake Times

Regularity is a core dimension of the sleep health framework, (Buysse, 2014). To establish regularity, the first part of this module is based on IPSRT (Frank et al., 2005; Frank, Swartz, & Kupfer, 2000) and stimulus control (Bootzin, 1972) principles. The second and third parts of this module include working with the client to plan a personalized wind-down routine before bedtime and a wake-up routine in the morning. These latter two modules support the process of establishing regular sleep–wake times.

Core Module 2: Improving Daytime Functioning

This module teaches strategies to improve daytime functioning with a focus on skills for coping with a night of poor sleep. Nighttime and daytime impairment can be at least partly functionally independent (Lichstein, Durrence, Riedel, &

Bayen, 2001; Neitzert Semler & Harvey, 2005). Thus, TranS-C includes separate strategies to help clients improve their nighttime sleep and their daytime functioning.

Core Module 3: Correcting Unhelpful Sleep-Related Beliefs

Holding unhelpful beliefs about sleep is common. This module uses education, guided discovery, and individualized experiments to address unhelpful beliefs about sleep. Several studies show that a reduction in unhelpful beliefs about sleep after treatment for insomnia is associated with persistent, enduring improvements in sleep (Edinger, Wohlgemuth, Radtke, Marsh, & Quillian, 2001; Morin, Blais, & Savard, 2002).

Core Module 4: Maintenance of Behavior Change

This module is designed to consolidate gains and ensure for setbacks using an individualized summary of learning and achievements. Therapist and client start preparing for this module by reviewing and charting progress, checking on goal attainment, identifying specific problem areas that need more attention, and summarizing the learning that has taken place over the course of treatment.

Optional Modules

There are seven optional modules that are used, depending on the needs of each client, and we provide guidance on deciding when to use each of them. While the order of the treatment components for each of the modules is broadly suggestive of the order of completion, it is important to be sensitive to the differences between clients as to which processes are maintaining their distress and to address those processes at an earlier stage of treatment. Of course, the therapist should not move from one treatment component to another until the client is ready. This approach recognizes that each client will move through the different stages of treatment at a different pace.

Optional Module 1: Improving Sleep Efficiency

Sleep efficiency is one of the six dimensions of healthy sleep. Too much time in bed spent not sleeping indicates sleep inefficiency. The extensive insomnia literature shows that two components of CBT-I are particularly effective for improving sleep efficiency: stimulus control and sleep restriction (Morin et al., 2006).

Optional Module 2: Reducing Time in Bed

Spending too much time in bed is a problem. It can impair one's ability to live life fully and makes it difficult to fully engage with work, family, and friends. It is also associated with more emotional disturbance, unhappiness, and interpersonal problems, more substance abuse, excessive daytime sleepiness, and impairment in daily activities and level of productivity (Kaplan, Gruber, Eidelman, Talbot, & Harvey, 2011). It is possible that too much time in bed will have an adverse impact on health because the human body has evolved to spend two-thirds of each day awake and active. As mentioned earlier, sleep duration and sleep efficiency are two of the dimensions of the sleep health framework (Buysse, 2014). Interventions include education on sleep inertia, assessing and problem-solving why the client spends so much time in bed, setting daytime goals, and developing strategies for managing low energy and fatigue.

Optional Module 3: Dealing with Delayed or Advanced Phase

This module is relevant if sleep is later or earlier than is preferred by the client. TranS-C includes shifting the timing of light and other zeitgebers earlier or later depending on the phase; for example, dim light, an electronic curfew, and progressively moving to an earlier bedtime for the delayed phase or a later bedtime for the advanced phase.

Optional Module 4: Reducing Sleep-Related Worry and Vigilance

People with sleep problems often worry while trying to get to sleep at the beginning of the night, after waking in the middle of the night, and on waking too early in the morning. Anxiety is antithetical to sleep (Espie, 2002), and because excessive worry and rumination fuel anxiety and arousal, it is important to teach these clients skills to manage their unwanted thoughts. A range of skills are taught, including how to identify and evaluate negative thoughts, practicing gratitude and savoring, setting a worry time, problem solving, journaling, and using pleasant imagery.

Optional Module 5: Promoting Compliance with the Continuous Positive Airway Pressure Machine/Exposure Therapy for Claustrophobic Reactions

While TranS-C does not directly treat sleep apnea, this module helps clients with sleep apnea to adjust to using a continuous positive airway pressure (CPAP) machine when prescribed by a sleep specialist. Education and motivational

strategies are used to increase CPAP machine use at night. Graded exposure is used with clients who have a claustrophobic reaction to the machine.

Optional Module 6: Negotiating Sleep in a Complicated Environment

Many environmental factors may interfere with the ability to sleep. This solution-focused module works toward minimizing the impact of these issues. The module assumes that clients have resources and strengths to resolve complaints. The emphasis is on acknowledging distress, focusing the conversation on success, and discussing solutions rather than problems—in other words, on what is possible and changeable, rather than on what is impossible and intractable (De Shazer & Dolan, 2012; Lloyd, 2008). The module draws on the evidence-based problem-solving module from Cognitive Behavioral Social Skills Training (CBSST; Granholm, Holden, Link, McQuaid, & Jeste, 2013), which involves teaching the client the *SCALE* acronym: **S**pecify the problem, **C**onsider all possible solutions, **A**ssess the best solution, **L**ay out a plan, and **E**xecute and **E**valuate the outcome as an approach to solving problems. Communication skills are taught through role playing.

Optional Module 7: Reducing Nightmares

Nightmares are disturbing because the content of the dream or the emotions in the dream are unpleasant, and these features persist after the sleeper awakens. Seventy-five to 90% of people who experience stressful life events report nightmares; most people have experienced a nightmare at least once in their life. This module is based on research by Barry Krakow, Anne Germain, and their colleagues (Germain et al., 2007; Krakow et al., 2001). The evidence base for treating nightmares with imagery rehearsal therapy is strong. It results in a significant reduction in the number of nightmares per week and in improved sleep. Interestingly, imagery rehearsal therapy is also associated with a decrease in PTSD symptoms (Casement & Swanson, 2012).

Who Is Qualified to Conduct TranS-C?

The ideal providers of TranS-C are individuals who have training and experience conducting CBT and MI and who have a working knowledge of the biology of sleep. Having said that, we have successfully trained people who have minimal knowledge of CBT and sleep to become outstanding TranS-C providers after having more intensive training and supervision that focuses on giving them extensive feedback on recorded sessions.

Who Is an Appropriate Client for TranS-C?

With developmental adaptations, as described throughout this book, we have been delivering TranS-C to treat sleep disturbance in youth 10 years or older through to older adults. In addition, we have been using TranS-C to treat sleep problems for both mental and physical illnesses. Clearly, the approach takes seriously the task of solving the "too many empirically supported treatments problem" (Weisz et al., 2014, p. 68).

More specifically, as part of a study funded by the National Institute of Child Health and Human Development (NICHD), we have been delivering this approach to 10- to 18-year-olds with a broad range of sleep problems, particularly teens who are night owls. Among youth, insomnia is a common sleep problem (Buysse et al., 2008; Gradisar, Gardner, et al., 2011). However, insomnia often overlaps with features of hypersomnia, difficulty getting up in the morning, sleepiness during the day, inadequate opportunity to sleep, irregular sleep–wake schedules, worry and rumination about social concerns (e.g., dating, getting into college) and worry and rumination about not sleeping. Accordingly, we have included adaptations to address this broad range of sleep disturbances effectively and efficiently.

In adults, as part of a study funded by the National Institute of Mental Health (NIMH), we have also delivered TranS-C to clients with a severe mental illness in a community mental health setting. The clients have a broad range of diagnoses, particularly schizophrenia, bipolar disorder, posttraumatic stress disorder (PTSD), and depression as well as comorbid medical problems. In this study, clients continue to take their usual medications. Interestingly, in an earlier study modifying CBT-I for those with bipolar disorder (BP) (Harvey et al., 2015), more clients in the CBTI-BP group than clients in the psychoeducation group were able to discontinue at least one sleep medication at some point during the treatment phase (66.7% vs. 29.4%; $p = 0.04$). Also, Buysse and colleagues (2011) conducted a large randomized controlled trial of a brief behavioral treatment for older adults with chronic insomnia; clients on medications were included and there was no difference in outcomes among clients taking or not taking sleep medications. Considering these studies together, we are confident that TranS-C can be delivered concurrently with usual medications.

Flexibility, Adaptation, and Balance

Box 1.2 broadly represents the order in which modules are typically completed. However, as we pointed out earlier, it is important to be aware of which processes maintain a client's distress and to address those processes at an earlier treatment stage, keeping in mind that clients make progress at different rates. Some clients quickly grasp the sleep and circadian education module

that forms the rationale for TranS-C. However, other clients do better when the therapist divides up this module across multiple sessions and flexibly adapts the material to optimally match the client's concerns and interests. The selection and sequencing of modules typically become apparent during the case formulation (Cross-Cutting Module 1, described in Chapter 3). For example, one client began the first session by telling the therapist, "I am a hopeless case. I have tried every treatment for my sleep problem. Nothing works. I am sorry but I am wasting your time." In this case, moving the thinking traps intervention within Optional Module 4 to Session 2 effectively encouraged the client to give TranS-C a try. Another client was worried about trying the recommended sleep adjustments. She said, "I will fail for sure. Then I will disappoint you." In this case, we moved the negative automatic thoughts portion of Optional Module 4 to Session 2. Evaluating the thoughts "I will fail for sure. Then I will disappoint you" with the Evaluating Negative Automatic Thoughts form (Appendix 15) was helpful for reducing the fear of failure.

When selecting which parts of TranS-C to emphasize, we advise providing a balanced perspective and using the material in this book flexibly, adapting it as needed for each client. For example, clients who have been encouraged (or forced!) to come to treatment by a parent/guardian, doctor, or a case manager can sometimes be relatively happy with their (poor) sleep and are unmotivated to change. For these clients, we prioritize spending time explaining the health consequences of poor sleep. Also, as the therapist gets to know each client, other motivations for change typically become apparent. For example, an adolescent client might care about getting good grades to get into college. In this case we would discuss in some detail the link between academic performance and sleep, and remind the teen of the link throughout the sessions. For clients who are very anxious about their sleep, we would not emphasize the health consequences of poor sleep, given that this will likely exacerbate anxiety and therefore the sleep problem. Instead, we would prioritize the modules that are most helpful for reducing anxiety (e.g., Core Module 3, Optional Module 4). Another common example are clients who are perfectionists. These clients sometimes need to devote *less effort* to sleeping, as described in Core Module 3, and prescribing rigid rules only adds to the long list of rigid rules they are already living by. Interestingly, Buysse et al. (2010) showed that people diagnosed with insomnia (who are often anxious too) have irregular wake times, but they are actually a bit more regular in terms of their bedtimes compared to people without a sleep problem. For people who present with this pattern, consider suggesting more flexible sleep–wake times. In other words, instead of recommending a specific time to go to bed and wake up, consider the recommendation "Go to bed no *earlier* than _____, and get out of bed no *later* than _____."

Session Structure

Box 1.3 lists the basic session structure for TranS-C, and its main parts are briefly described next.

Set the Agenda

Following an introduction of the general CBT principles, every session begins by setting an agenda. Say what you would like to do in the session, check whether your agenda is acceptable to the client, and ask the client if anything needs to be added to the agenda. Be careful that the agenda set at the beginning of the session doesn't get long and boring. Try to add excitement and inspiration to your tone of voice and to the content of the agenda—for example: "Sleep is *so* interesting. I am very excited to share some information on the science behind why and how we sleep."

Ask the Client for Feedback on the Previous Session

Typically the next agenda item is to ask for feedback on the previous session and provide memory support for the content of last session. For example, "It's been about a week since we met. Did we do anything or did I say anything

BOX 1.3. Basic Session Structure

- Set the session agenda.
- Review the previous session with the client.
- Review and comment on the daily sleep diary.
  - How regular or irregular are the bedtimes and wake times across the 7 days?
  - Any long sleep onset latencies? How long?
  - Any long awakenings after sleep onset? How long?
  - Any snoozing in the morning after wake time?
  - How many awakenings during the night? For how long?
  - Any naps?
- Review the goals and homework assigned in the previous session.
- Work on the client's main problems.
- Set goals and give homework for the next week.
- Ask the client to summarize the session.
- Ask for feedback on the session.

that was particularly helpful or unhelpful?"; "Thinking back to our last session, what stood out to you the most?" It doesn't matter if the client can't remember anything; the therapist should then chime in with the two to three points that are most helpful to remember. This practice promotes encoding of the main contents of treatment (Harvey et al., 2014).

Review and Comment on the Daily Sleep Diary

The client should bring the completed sleep diary to every session. It is an important source of information about current sleep habits and the effect of suggested interventions. Reviewing the diary may directly lead into new treatment recommendations.

Review Goals and Homework Assigned in the Previous Session

Did your client complete the homework or achieve the goal? What did he or she learn? If not, why not?

Work on the Client's Main Problems

Incorporate frequent summaries using simple language. Use a white board or paper tablet when relevant. Use in-session and between-session behavioral experiments. The client or therapist can write a brief summary of the session's main points for the client to take home.

Set Goals and Homework for the Next Week

We strongly recommend having a written copy of any assignments for clients to take home to help them remember. Make a clear rationale for each item on the homework list and how the assignment's activity relates to the client's goals for therapy. Begin the assigned activity in session by practicing the skills, anticipating the difficulties, and asking the client, "What things might prevent you from doing this?" Reinforce the value of the home project by asking, "Any thoughts about how you might use this information you gather from this?"; "Can you think of anything that will prevent you from doing it?"; "How could you answer that thought at the time?"; "What could we plan now that might overcome that problem?"

Ask the Client to Summarize the Session

Ask the client what are the main points or what she or he has learned—for example: "Was there anything that stood out that you want to be sure to remember?" Help the client by filling in the gaps.

Ask for Feedback on the Session

Check whether there was anything in the session that was unsatisfactory or unhelpful. Ask for feedback about how it went—for example: "Did we do anything or did I say anything that was particularly helpful or unhelpful?"

Key Interventions Used in TranS-C

Education about Sleep

In addition to the support provided in Chapter 3, we provide several categories of accompanying materials, or handouts, that provide the client with education about sleep. These handouts are contained in Appendices 4, 5, and 8. Working through these handouts collaboratively with the client can generate talking points and prompts to help you cover several of the main topics. Also a list of helpful videos available on the Internet (Appendix 2) and various other forms of media (Appendix 1) are particularly helpful for catching the client's attention and breaking up more didactic portions of the session.

Behavioral Experiments

Bennett-Levy et al. (2004) define behavioral experiments as

> planned experiential activities, based on experimentation or observation, which are undertaken by clients in or between . . . therapy sessions. Their design is derived directly from a . . . formulation of the problem, and their primary purpose is to obtain new information which . . . [includes] . . . contributing to the development and verification of the . . . formulation. (p. 8)

Behavioral experiments encourage clients to make judgments in their lives based on data they collect, as scientists do, rather than based solely on their subjective feelings.

We suggest setting up experiments during the course of TranS-C and provide examples of such experiments in subsequent chapters. Very often, conducting one simple behavioral experiment brings about a profound disconfirmation of unhelpful beliefs or stunning demonstrations that certain behaviors or thoughts are important contributors to the sleep problem. Behavioral experiments are much more powerful for facilitating change than verbal discussions of the same topic (Harvey, Clark, Ehlers, & Rapee, 2000; Tang & Harvey, 2004). They offer deep experiential learning that new thoughts, beliefs, and behaviors can reduce anxiety and improve sleep. Indeed, in TranS-C we consider each client to be a budding sleep scientist. This approach also encourages a curiosity and sense of adventure that often generates a willingness to try a

new behavior "just once." Quite often, this experiment is enough to kick-start the building blocks of a new, healthier habit.

There are endless possibilities for behavioral experiments for sleep problems. As discussed in subsequent chapters, some experiments are conducted *within a session* and others are given as homework to be conducted *between sessions*. The latter can be facilitated with text or email support from the therapist (e.g., the client might text the therapist the result of the experiment soon after completing it). Some experiments involve observation (e.g., the survey experiment described in Core Module 3), whereas other experiments involve an experimental manipulation (e.g., the energy experiment described in Core Module 2). Also, some experiments are thought experiments, while other experiments involve a change in behavior.

As specified by Bennett-Levy et al. (2004), there are six steps to completing a behavioral experiment: (1) precisely identify the belief, thought, or process; (2) brainstorm ideas for an experiment to test the thought or belief (very specific); (3) make predictions about the outcome and devise a method to record the outcome; (4) anticipate problems and brainstorm solutions; (5) conduct the experiment; and (6) review the experiment and draw conclusions. Additional tips for behavioral experiments are presented in Box 1.4.

CBT Skills

The therapist skill of guided discovery is crucial in TranS-C. Therapist questions can encourage the client to use their current knowledge and experience to piece together and discover things or piece together evidence in a new way. The stance of the therapist is collaborative and curious, using questioning to help the client to look at situations in various ways and to help the client to draw his or her own conclusions. We encourage readers who are unfamiliar with these skills to refer to CBT resources where these skills are taught in detail (J. S. Beck, 2011; Greenberger & Padesky, 2016; Wells, 1997).

Stimulus Control and Sleep Restriction

These interventions are used when the client has become conditioned to associate the bed or bedroom with being awake and anxious about not sleeping. Stimulus control and sleep restriction are designed to break the bed–not sleeping link and restore the bed–sleep link. In stimulus control, developed by Richard Bootzin and colleagues (Bootzin, Epstein, & Wood, 1991), the client is to go to bed only when sleepy, use the bed only for sleep and sex, and get out of bed if he or she is not falling asleep. The basic idea behind sleep restriction, developed by Arthur Spielman and colleagues (Spielman, Saskin, & Thorpy,

BOX 1.4. Tips for Behavioral Experiments

When developing a behavioral experiment:

- Conduct a *thorough assessment* of the domain you are targeting. For example, don't target caffeine if you don't know your client's pattern of caffeine use.
- Make the experiment *consistent with a goal* you and your client have agreed to work on together. For example, don't target caffeine if your client is not on board with reducing caffeine use.
- *Make the experiment brief or once only.* Many clients are more likely to give a new sleep pattern a try if it is set up as an experiment for just *one day* or *one weekend*. Often one experience of the new sleep pattern is enough to convince the client to consider using the new strategy habitually.
- *Consider offering between-session support.* We often offer between-session support for experiments. For example, in working on a wind-down routine, you could text the client at the "switch time" (the time the person has decided that he or she would like to switch into his or her wind-down routine) for a few nights in the hope that this approach helps to build an action tendency for the person to make the switch on his or her own. Future research is needed to determine how many nights are needed to create an "action tendency."
- *Do not focus on unrealistic outcomes.* Clients may not immediately feel better when they change their sleep patterns for the following reasons:
  - Some clients respond to sleep deprivation with hypomania, so they may feel better in certain ways when they are not getting enough sleep.
  - Clients' feelings (e.g., tiredness) may have become the norm. It might take time for this habit to change.
  - Clients may confuse feelings of tiredness with feelings of boredom.
  - If clients have been habitually sleep deprived or have habitually had irregular sleep and wake times, it can take 1–3 weeks to realign their biological clocks before they notice feeling better. Thus, if you make "feeling more alert" the outcome of a behavioral experiment, consider explaining to the client why this change may not be observed right away.

1987), is that time in bed should be limited to maximize the sleep drive, so that the association between the bed and sleeping is strengthened. It begins by reducing the time spent in bed. More detailed instructions can be found in Optional Module 1.

Additional Interventions

Other interventions include exposure for clients who have phobic reactions to using the CPAP machine (Optional Module 5), role playing for teaching communication skills to help clients negotiate sleep in a complicated environment (Optional Module 6), and imagery rehearsal therapy for reducing nightmares (Optional Module 7).

Working with Parents and Caregivers of Adolescent Clients

The increasing independence of adolescents means that when delivering TranS-C to youth we are principally youth focused. Nonetheless, parents and caregivers can often help to promote an acceptance and reinforcement of treatment-mediated changes and keep their child enrolled in treatment. In those families with unhealthy dynamics, maintaining contact with the parents can help the clinician to circumvent them from subtly undermining sleep changes. Our focus is to orient parents toward positively reinforcing their teen for establishing a regularized sleep–wake cycle and assisting their teen *when invited.* When developmentally appropriate, we typically invite parents to join the final 5–10 minutes at the end of each session. In this time, the teen (assisted by the therapist) gives a summary of the session and the plan for the coming week and might ask for specific forms of help from their caregiver. However, we have learned to go with teens' wishes when they do not want to bring their parents or caregivers into the session. Particularly for older youth, there can be much conflict at home around sleep. It is better to not bring these issues into the therapy room. Instead, place phone calls to the parent(s) between sessions.

We have also found it very helpful to ask about the schedule of the parents, siblings, and other people who live in the house, as described in the following examples.

> A client's father worked an evening shift and then enjoyed special time with his daughter in the later evening. Knowing the father's schedule was important for negotiating with the father and daughter to find an earlier bedtime. We moved the special father–daughter time to Saturday morning brunch as an incentive to help the daughter get up in the morning, while also helping her to get to sleep earlier on weeknights.

We worked out a morning schedule with a client that upset the client's mother because it meant that she would be 30 minutes late for work. We should have checked with the client's mother about her schedule first.

When talking to parents and caregivers, we suggest trying to:

- Emphasize the importance of their teen's regular attendance at sessions.
- Emphasize the importance of their teen's completion of the sleep diary.
- Elicit motivational statements.
- Help develop plans for overcoming barriers to treatment that may arise.
- Clarify their role.
- Share sleep-related resources they may find interesting or helpful.

See the handout we give parents on their role in their teen's sleep treatment in Appendix 12.

No One Sleeps Perfectly All the Time

The ongoing emphasis throughout TranS-C is that everyone has a bad night of sleep sometimes, particularly when stressed, and this is normal. One of the aims is to equip clients with tools and methods to help them continue to improve their sleep and cope with an occasional night of poor sleep once therapy is over. An explanation of normal sleep can be helpful, noting that everyone usually wakes up at night, and everyone has some variability in their sleep from night to night. The survey experiment described in Core Module 3 can help a client to grasp the reality of a normal night of sleep.

Plan of this Book

This chapter has introduced TranS-C, outlined the theoretical and clinical principles that are core to TranS-C, and presented an overview of its modules and structure. The next chapter focuses on the initial assessment of clients who present with a sleep problem. The assessment helps to determine which clients are appropriate for TranS-C and instructs therapists on how to deliver TranS-C. Chapters 3, 4, and 5 describe the cross-cutting modules, core modules, and optional modules that comprise TranS-C, respectively. An epilogue is devoted to summarizing the approach and outlining future directions.