

## Disturbed Dreaming in Medical Conditions

Tore A. Nielsen

### ABSTRACT

Disturbed dreaming has been identified as a common primary or secondary symptom in several medical conditions, in addition to idiopathic nightmares and sleep–wake transition disorders. In these medical conditions, dream disturbances vary along a continuum of dream experience intensity. At the lower extreme of this continuum, dream recall ceases entirely (global cessation of dreaming) or is unusually impoverished in quantity or content (dream impoverishment). Impoverishment affects patients with alexithymia, posttraumatic stress disorder (PTSD), and some brain syndromes. At the higher extreme, dreaming is uncharacteristically excessive, vivid, and emotional (excessive dreaming). Excessive dreaming occurs in patients with epic dreaming, some brain lesions, and withdrawal from some medications. Dreaming may become so intense that it is confused with reality (dream–reality confusion), as is the case with the existential dreams of bereavement, with postpartum infant peril dreams, with intensive care unit delirium dreams, with dreams resulting from limbic lobe damage, and with psychotic dream-related aggression. Intense dreaming may also become rigidly stereotyped in structure (dream stereotypy). Conditions such as rapid eye movement (REM) sleep behavior disorder (RBD) with or without parkinsonism, epilepsy, PTSD reexperiencing dreams, migraine dreams, and prodromal cardiac dreams are affected by dream stereotypy. In many cases, dream disturbances appear to be aberrations of otherwise normal dream qualities, such as intensification, reality-mimesis, or recurrence. Often, sleep fragmentation is implicated in the disturbance, but causal relationships are not yet clear. Although it is primarily REM sleep that is involved, some disturbances are also seen in disorders affecting non-REM sleep. Effective treatments are available for many common disturbances, and other treatments are under development.

In addition to the common dream disturbances of idiopathic nightmares and sleep–wake transition disorders (see Chapter 77), disturbed dreaming has been identified as a common primary or secondary symptom in several other medical conditions (Table 78–1). These disturbances can be organized conveniently along a continuum of varying vividness or intensity of the dream experience. At the lower extreme of this continuum, dream recall ceases entirely or is unusually impoverished in quantity or content. At the higher extreme, it is uncharacteristically excessive, vivid, and emotional, frequently confused with reality or rigidly stereotyped in structure.

### GLOBAL CESSATION OF DREAMING

Changes in the recall of dreams and in their global characteristics as a function of neurologic illness have been appreciated

ever since Charcot<sup>1</sup> reported on a patient with complete loss of visual imagery, including loss of visual dreaming.

About a third of patients with neurologic illness queried about *global cessation of dreaming* (GCD) report having ceased dreaming altogether.<sup>2</sup> Parietal lobe involvement is a significant aid to differentiating between patients with and without GCD, as 42% of GCD patients have parietal lesions and an additional 7% have lesions in close proximity to parietal lobe (periparietal). Parietal involvement confirms findings from a previous study.<sup>3</sup> The finding of frontal lobe lesions characterizing some patients (8%) with GCD<sup>2</sup> is consistent with the reduced dream recall seen after frontal lobotomy among schizophrenic patients<sup>4</sup> but not with results from another study.<sup>3</sup> The 43% of GCD cases not linked to parietal or frontal lesions have diffuse and nonlocalizable lesions.<sup>2</sup>

The findings of relatively intact dreaming after right hemispherectomy<sup>5</sup> but extremely impoverished recall after left hemispherectomy<sup>6</sup> support a left-hemisphere lateralization explanation of GCD. Neuropsychological reviews<sup>7,8</sup> also favor a predominant role for *left* hemisphere processes in dream generation more generally.

### DREAM IMPOVERISHMENT

Dream impoverishment is a chronic attenuation, but not a total cessation, in the recall, length, vividness, emotionality, or narrative complexity of dream imagery. Impoverished dreaming has been documented above all among psychosomatic patients, particularly those with alexithymia, patients with posttraumatic stress disorder (PTSD) (who also have a high incidence of comorbid alexithymia<sup>9</sup>), and some types of brain syndrome.

### Impoverished Dreaming in Alexithymia

Alexithymia refers to a difficulty in verbalizing emotions, literally, to a lack of a lexicon for describing feelings. Early investigations of psychosomatic patients<sup>10,11</sup> linked an alexithymic response style with diminished dream recall and an impoverished imaginal life more generally. An absence of affect in dreams was also frequently noted. Levitan<sup>12</sup> described dreams from many psychosomatic patients with alexithymia in which either the protagonists in the dreams failed to fully perceive their own feelings or their feelings were minimized by attributing them to other characters.

A study<sup>13</sup> of patients with nocturnal asthma—a population with a high incidence of alexithymia<sup>14</sup>—revealed that rapid eye movement (REM) sleep awakenings produced an elevated incidence of dreams with short sentences and impressions of having dreamed but with no specific recall.

Studies have reported evidence of impoverishment in dream sensory and structural features in alexithymia. One study of

**Table 78-1. Medical Conditions in which Dreaming Is Disturbed**

|                              | Conditions Commonly Affected   | Essential Features  |
|------------------------------|--|---|
| Global cessation of dreaming | Charcot-Wilbrand syndrome<br>Frontal lobotomy<br>Parietal lobe lesions                                       | Complete loss of dream recall; often, sudden onset after illness or medical procedure                                     |
| Dream impoverishment         | Alexithymia<br>PTSD<br>Brain syndromes   | Reduction in recall, vividness, or complexity of dreaming   |
| Excessive dreaming           | Epic dreaming<br>Brain damage<br>Drug withdrawal   | Dreaming seems to continue throughout the sleep period; may involve dream vivification, banal or repetitive dream content |
| Dream–reality confusion      | ICU dream delirium<br>Postpartum infant distress<br>Existential dreams<br>Psychotic dream-related aggression | Dream vivification; banal or everyday content may be confused with actual events  |
| Dream stereotypy             | RBD/parkinsonism<br>Epilepsy<br>PTSD<br>Migraine<br>Cardiac disease  | Frequent recurrence of same dream content; may incorporate features of medical condition (e.g., aura, cardiac symptoms)   |

Abbreviations: ICU, intensive care unit; PTSD, posttraumatic stress disorder; RBD, REM (rapid eye movement) sleep behavior disorder.

the general Finnish population<sup>15</sup> found that alexithymic subjects reported colorless dreams, and a second<sup>16</sup> found that the dreams of nonclinical alexithymic subjects were less fantastic than those of controls; these groups did not differ on other measures of dream recall and emotion, however.

Sleep studies have not yet identified a consistent pattern of changes that might explain dream impoverishment. In one study,<sup>17</sup> higher alexithymia scores were related to several REM sleep variables: more frequent REM sleep episodes, shorter REM sleep latency, and more stage 1 sleep during and immediately after REM. However, alexithymia was also related to non-REM sleep variables: increased stage 1 and decreased stage 3/4. In a second study,<sup>18</sup> alexithymia scores did not correlate with any polysomnographic (PSG) variable or with rapid eye movement density; however, there was an association with shortened REM sleep latency. Finally, a survey study<sup>15</sup> indicated that alexithymia is reliably associated with certain sleep disorders, such as chronic insomnia and parasomnias.

In sum, although converging evidence indicates that dream impoverishment is associated with alexithymia, more research is needed to clarify relationships between alexithymic sub-components and various attributes of dream recall, dream content, and dream emotion. Sleep measures also require further clarification.

It is also noteworthy that other patterns of disturbed dreaming characterize some alexithymic patients—for example, dreams that are extremely macabre, nightmarish, or lacking in ego and emotional control.<sup>19</sup> A similar manifestation of both impoverished and nightmarish dreams also characterizes patients with PTSD.

### Impoverished Dreaming in Posttraumatic Stress Disorder

As unlikely as it might appear from the predominance of nightmares in patients with PTSD (see Chapters 46 and 111),

convergence of evidence suggests that a long-term consequence of PTSD is impoverishment of some features of dreaming. This evidence, as well as findings of sleep changes, have been reviewed concisely.<sup>20,21</sup>

Both home and laboratory studies indicate that patients with PTSD have lower than normal levels of dream recall. Furthermore, the dreams tend to be brief, to deal with trivial daily events, and to be associated with paradoxically high eye-movement densities.<sup>22</sup>

A study of subjects with disturbed dreaming<sup>22</sup> found dream recall only 42% to 54% of the time, compared with 89% to 96% for controls. Similarly, a “well-adjusted” group of 12 patients with PTSD<sup>23</sup> had a significantly lower dream recall rate from REM sleep (33.7%) than groups of either 11 less well-adjusted patients (50.5%) or 10 controls (80%). The well-adjusted patients reported dreams that were less complex and less salient; fewer dreams with anxiety, aggression, and conflict; and higher scores for denial of emotions toward their dreams.

Other studies have not demonstrated reduced dream recall in patients with PTSD<sup>24,25</sup> but at least one has reported, consistent with the previous findings, that laboratory dream recall is *negatively* correlated with trauma severity.<sup>25</sup>

Impoverished dreaming in PTSD remains unexplained, although at least two, very likely interrelated, explanations are feasible. First, the impoverishment may reflect an adaptive response or strategy that reduces overall dream recall and thereby suppresses the occurrence of nightmares.<sup>23</sup> Second, mechanisms responsible for dream impoverishment in alexithymia (see earlier) may also be active in PTSD. There is a high incidence of comorbidity with alexithymia,<sup>9,26</sup> in one study,<sup>27</sup> 85% of patients with PTSD were in the alexithymic range. Hyperarousal and emotional numbing may be common to the etiologies of both conditions. Emotional numbing, which is thought to be equivalent to alexithymia in the PTSD population,<sup>9</sup> is best predicted by the number of hyperarousal

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symptoms in patients with PTSD.<sup>28</sup> Patients with PTSD may expend so much cognitive, behavioral, and emotional effort managing hyperarousal and reactivity symptoms that they exhaust or deplete their emotional resources including, possibly, a depletion of catecholamines.<sup>29</sup>

### Impoverished Dreaming in Brain Syndromes

In chronic brain syndrome, dream recall from REM sleep deteriorates as the illness progresses from mild (57% recall) to severe (35%) to aged and severe (8%).<sup>30</sup> In Korsakoff's psychosis caused by chronic alcohol abuse, near-normal REM sleep time (29.4%) but poor dream recall (3%) is observed.<sup>31</sup> Patients with permanent amnesia for recent events due to mild encephalitis also have impoverished dreaming; the frequency of their reports on awakening from REM sleep (28%) is less than normal (75%), and the report content is simpler, nonsymbolic, and more repetitious, stereotyped, and lacking in emotions and day residues.<sup>32</sup>

### EXCESSIVE DREAMING

There are several conditions in which patients complain that their dreams are too abundant, too vivid, or unrelenting. Schenck and Mahowald<sup>33</sup> proposed the term *epic dreaming* to refer to complaints of both excessive dreaming ("dreaming all night long") and daytime fatigue. Apart from a subsequent case study published by our group,<sup>34</sup> this interesting category has not been further elaborated. Patients have the impression that throughout the night they dream about activity that is continuous, trivial, or banal or physical in nature—for example, repetitive housework, endless walking through snow or mud. Intense sensations of acceleration or spinning can also occur. Such dreams occur nightly in 90% of affected patients and 4 nights per week in the remainder.<sup>33</sup> Comorbid nightmares are reported by 70%,<sup>33</sup> although, unlike in nightmares, emotional arousal is strangely absent from epic dreams. Thus, although excessive, epic dreams are paradoxically impoverished in some respects (see earlier). Feelings of fatigue or exhaustion, as well as the recall of endlessly repetitive dreams, may produce distress and lead patients to seek help.

Epic dreaming is more commonly reported by women (85%) than men (15%).<sup>33</sup> PSG evaluation reveals no clinical abnormalities, etiology and pathophysiology remain unknown, and treatments (cognitive, hypnosis, relaxation, medications) have proved largely ineffective.<sup>33</sup> Comparative studies of epic dreams with normal dreams, nightmares, and recurrent dreams might shed light on possible pathophysiologic factors, such as whether the repetitive motor imagery is an amplified form of motor imagery in normal dreaming<sup>35</sup> or whether epic dreams are a type of nightmare stripped of affective intensification.

Other types of excessive dreaming occur in patients with brain lesions<sup>2</sup> and include increases in both the frequency and the vividness of dream imagery.<sup>36,37</sup> Some brain-damaged patients also report more continuous dreaming—that is, dreaming the same content throughout the night, despite intervening episodes of wakefulness.<sup>2,36,37</sup> Neuropsychological evidence points to involvement of the anterior limbic system.

Excessive dreaming may also be induced by withdrawal from certain medications. Excessive, vivid, and early-onset

dreaming follows withdrawal from tricyclic antidepressants<sup>38</sup> or short half-life serotonin reuptake inhibitors such as paroxetine or fluvoxamine.<sup>39</sup>

An explanation for excessive dreaming is currently lacking, but it is likely that it, like other dream disorders, is an aberration of one or more characteristics of normal dreaming.

### DREAM-REALITY CONFUSIONS

One characteristic of dream intensification is its closer approximation to real sensorimotor, emotional experience (or reality mimesis). This intensified realism is self-evident to anyone in the grips of a vivid nightmare. Heightened reality mimesis during dreaming is also common among patients with sleep paralysis and narcolepsy.<sup>40</sup> Here, dream-reality confusions of varying magnitudes are described for four conditions.

### Existential Bereavement Dreams

Kuiken and colleagues<sup>41,42</sup> identified a category of realistic dreams referred to as *existential* dreams that frequently culminate in intensely real endings—often producing awakenings. Such dreams are characterized by a heightened reality mimesis, including distressing emotions (e.g., sadness, despair, guilt), salient bodily feelings (e.g., ineffectuality, paralysis), and failures in goal attainment. Themes frequently involve separation and loss and the appearance of deceased family figures. These features distinguish existential dreams from typical nightmares. Their clinical importance is their appearance during bereavement, which involves a range of distressing emotions other than fear. Bereavement is also characterized by hallucinations and vivid feelings of the presence of the deceased in both dreaming and waking states.<sup>43,44</sup> Existential dreams are common throughout the bereavement period (0 to 5 years after a loss), whereas other dream types are more salient either immediately after (anxiety dreams) or from 3 to 5 years after (transcendent dreams) a loss.<sup>45</sup> A sense of the presence of the deceased also continues throughout bereavement, whereas hallucinations of the deceased diminish over time.<sup>46</sup>

### Postpartum Infant Peril Dreams

Postpartum mothers often dream vividly of their infants being either lost or in danger (peril dreams) and may, during these dreams, enact behaviors such as searching, vocalizing, or weeping. A frequent occurrence, what we refer to as BIB (for baby-in-bed) dreams, is that the mother dreams she has lost her infant in the bed and, while asleep, searches anxiously through the covers, weeps, calls out in alarm or touches the spouse thinking that some part of him is the infant.

The prevalence of peril dreams and sleep behaviors is remarkably high.<sup>47</sup> Over 12 postpartum weeks, 77% of women are able to recall the first dream involving their new infant. Of the latter, 73% (50% of total sample) reported at least one peril dream and 63% (44% of total sample) reported associated sleep behaviors. The latter value (44%) is much higher than the number of mothers (28.2%) who reported past or current somnambulism at least "rarely."

The mother's intense emotional and motoric arousal during the dream probably contributes to their appearance. The impact of the dreams is also substantial: 41% of mothers reported continuing anxiety after awakening from them, and



60% reported going to check on the infant. The hallucinated presence of the infant in these dreams suggests possible similarities with mechanisms producing presence imagery in sleep paralysis, narcolepsy, and existential dreams.

Mothers' responses to questioning revealed that peril dreams were predicted by relatively recent, stress-related factors such as difficult pregnancy, sleep disruption, infant–mother bed sharing, and anxiety, whereas sleep behaviors were predicted by sleep disruption and prior psychopathologic factors such as somnambulism, general psychopathology, and attachment disturbance.<sup>47</sup>

### Intensive Care Unit Dream Delirium

Nightmarish intensification of dreaming is reported by patients struggling to survive life-threatening conditions in intensive care units (ICUs). The vivid nightmares often convey feelings of extreme horror, dread, or impending mortality, and their content may depict the patients' afflictions, agonizing treatments, isolation, dependency, and the real possibility of death. Few verbatim narratives have been published, but several studies attest to their high prevalence, their alarming nature, and their potentially traumatizing long-term influence on patients.

One assessment<sup>48</sup> of traumatic ICU memories reported by 80 patients with acute respiratory distress syndrome found that nightmares were by far the most frequently remembered “trauma” (i.e., 64% of patients). They were described to be of a “bizarre and extremely terrifying nature” and were far more common than any of the other three types of trauma evaluated: anxiety (41%), pain (40%), and respiratory distress (38%). A follow-up of 52 patients<sup>49</sup> found that nightmares were still the most prevalent traumatic memory (75% versus 46%, 42%, and 42%) and contributed to accurate prediction of future PTSD.

A study of critically ill patients requiring intubation, ventilation, and sedation<sup>50</sup> found that length of stay in the ICU was the best predictor of nightmares. Of the 127 patients who stayed for more than a day, 18.1% reported nightmares and 14.2% hallucinations—many more than the 162 staying less than a day (2.5%, 0.6%). Two thirds of patients premedicated with benzodiazepines later reported postoperative dreams, half of which were nightmares.<sup>51</sup> Several other likely contributing factors included pain, anxiety, noise, and the inability to lie comfortably in bed.<sup>52</sup>

Vivid ICU dreams form part of a larger constellation of psychiatric signs and symptoms that include poor orientation, fluctuating levels of consciousness, paranoid delusions, and hallucinations<sup>53</sup> and that are referred to collectively as ICU psychosis, ICU syndrome, or ICU delirium. Prevalence estimates of the syndrome vary considerably: 13% to 38% in one study,<sup>54</sup> 40% to 57% in another.<sup>55</sup> A recent review<sup>56</sup> of 26 studies found the average incidence to be 37%, with a range of 0% to 74%.

It remains unclear whether or how disturbed sleep contributes to ICU dreams and ICU psychosis more generally.<sup>56</sup> Sleep deprivation and fragmentation are probable contributing factors, as sleep is readily disturbed by illness stress, near-death trauma, excessive noise, night lighting, pain, interruptions from medical or nursing staff, and numerous other variables. Patients who are sleep deprived are more likely to exhibit signs of altered states of consciousness than those who are not.<sup>57</sup>

About a quarter of ICU patients claim that lack of sleep is a problem.<sup>52</sup> Even when optimal sleep conditions are provided, ICU sleep can be poor. For example, in a study<sup>58</sup> of nine surgical patients, sleep time (stage 1 excluded) for the first 2 days was less than 2 hours out of each 24. Stages 3 and 4 and REM sleep were severely or completely suppressed. Because stage 1 sleep accounted for 40% of total sleep time (versus 5% in controls<sup>58</sup>), it is very likely that sleep-onset hypnagogic hallucinations were more frequent and intense and contributed to increased dream and nightmare recall.<sup>59</sup>

Circadian rhythm abnormalities are another possible disruptive factor in ICU psychosis. Delirious patients in general may display a reversal of the circadian cycle, with daytime somnolence and nocturnal restlessness and agitation.<sup>60</sup>

### Limbic Lobe Damage

Confusion of dreaming with reality has been described as characteristic of a small subgroup of neurologic patients (10 of 189, or 5.3%).<sup>2</sup> These confusions may be the result of localized anterior limbic lesions, but no one specific pattern of lesions within this region is selectively associated with the symptom. Equal numbers of cases show lesions in medial prefrontal cortex, anterior cingulate gyrus, basal forebrain nuclei, and anteromedial diencephalic nuclei. The most severe cases also involve medial frontal cortex.<sup>2</sup>

### Psychotic Dream-Related Aggression

Dream–reality confusion may be at its most extreme among individuals who are either borderline psychotic or in the throes of a psychotic episode. Reports<sup>61–67</sup> of several extreme cases in which violent, psychotic acts were linked to prior dreams raise the possibility of a complete dream–reality *fusion* in some individuals.

In one recent news report,<sup>66</sup> a 53-year-old “deranged” man used knives to attack 10 young children in a church cafeteria: “In my dreams, I heard a voice saying that my wish will be fulfilled and I will live only if I kill many people”; he also told police that he kept hearing the voice even when awake.

Hempel et al.<sup>63</sup> reports five similar cases, two of which involved homicide, and three, violent assaults. All of the individuals were relatively young (27 to 43 years old), four were men, all suffered from paranoid psychosis, and all typically awakened from their dreams in a “very agitated and hostile state” (see p. 611 of Hempel et al.<sup>63</sup>). These authors propose psychotic dream-related aggression as a nosologic category to encompass this phenomenon and to distinguish it from other forms of sleep-related violence such as that seen in severe somnambulism. They and several others (see review<sup>68</sup>) concur that the intensification of dreaming to the point that it is mistaken for reality is a hallmark of psychotic dreaming. During acute psychotic phases, dreams may be lived as real events.<sup>69</sup> Often, realistic dreams anticipate a violent psychotic act itself. In some instances, the dreams even appear to play a direct causal role in the violence (e.g., an authoritative oneiric voice commands a crime) or an indirect role (e.g., the individual reacts to being repeatedly “killed” by others, in dreams, by acting out).<sup>61,63</sup> However, it remains to be determined whether such dreams are, in fact, causally implicated or whether they are simply parallel expressions of a psychotic process that compels its effect independent of sleep state.

## DREAM STEREOTYPY

Recurrent dream themes are normal in the general population.<sup>70</sup> Indeed, it might be argued that the predominance of fear in nightmares is the most prevalent stereotyped dream motif. Or, that specific nightmare themes like pursuit, threat, and assault are instances of dream stereotypy, as are the dreams of paralysis and presence seen in sleep paralysis and narcolepsy. However, in the present context, use of the term *dream stereotypy* is restricted to dreams that occur in conjunction with a medical condition and for which their content, structure, or affective quality has become so highly repetitive that patients are distressed. Neurobiologic or psychological features of the associated medical condition may play a role in shaping the precise stereotypical content of such dreams.

### REM Sleep Behavior Disorder/ Parkinsonism Assault/Defense Dreams

REM sleep behavior disorder (RBD) is characterized by excessive motor activity during sleep and REM sleep behaviors that may enact the patient's ongoing dreams or nightmares.<sup>71,72</sup> Dream-enacting behaviors were reported by 93%, 87%, and 64% of patients in the three largest series ( $N = 93, 96,$  and  $52,$  respectively) reported. PSG recordings indicate that patients do not enact all of the dreams they have in REM sleep. However, partial expression of many dreams is suggested by elevated levels of muscle tone, increased phasic electromyographic activity, and more numerous gross body movements during REM sleep, even in the absence of overt behavior. However, patients do not always recall dream content on awakening from episodes of overt behavior. This may result from factors such as poor recall of dreams among older adults, a lack of salience or memorability of some dreams (e.g., neutral affect, little motor involvement), or the inhibiting effect of sleeping in a laboratory.<sup>73</sup> Nonetheless, most patients do report that since the onset of RBD, their dreams have become more vivid, violent, and action filled and are experienced as nightmares.<sup>74</sup>

Clonazepam not only suppresses the abnormal behaviors of REM sleep but reduces the disturbing dreams associated with them<sup>75,76</sup>; cessation of the medication is followed by a recurrence of both abnormal behaviors and nightmares.<sup>75</sup>

Although a panoply of dream-enacting behaviors has been reported, associated dream themes are largely stereotyped in their structure and emotional content.<sup>77,78</sup> This is shown in Table 78-2, which summarizes examples of dreams for which specific enacting behaviors were identified by the investigator. The most frequent pattern is that of vigorous defense against attack. Of the 17 specific dream instances, the vast majority (82.4%) are of self-defense against assaults by people (58.8%) and animals (23.5%); 11.7% involve sports themes and 5.9% a friendly social gesture. Very similar results are reported for the 37 (of 67) patients with RBD who were able to report dream content to their physicians<sup>79</sup>: most (87%) are again of defense against attacks by either people (57%) or animals (30%).

More rarely, patients have reported recurrent dreams about vestibular activation (e.g., spinning objects and angular motions with acceleration) or instances of atonia intruding into dreamed movements (e.g., suddenly stuck in mud, trapped in deep snow, and falling to the ground and unable to get up).<sup>74</sup> Very similar dream themes were reported by some normal

subjects who were administered intense lateralized pressure stimulation during REM sleep,<sup>80</sup> raising the possibility that these types of RBD themes may be shaped by disruption of the sensory-motor balance normally characterizing REM sleep. Sensory-motor imbalance may be induced by lapses in muscle atonia or by disinhibition of patterned motor activity, or by both.<sup>81</sup>

In a similar fashion, stereotypical RBD defense nightmares may also be influenced by sensory-motor imbalance. A defense nightmare may simply be an instance of the most common dream type—pursuit/assault<sup>70</sup>—whose motor engagement and affective intensity has been amplified by sensory-motor imbalance.

It remains unknown to what extent RBD sleep behaviors are, in fact, isomorphic with their associated dream content. Although there is no doubt that reported dreams match associated behaviors in general respects (see Table 78-2), some cases suggest the possibility that dreamed and enacted behaviors may be subtly different. For example, Schenck and Mahowald<sup>74</sup> state that men with RBD often dream about fighting to protect their wives from an attacker but discover on awakening that they are attacking their wives instead. If this "error" is akin to those cases of somnambulistic violence in which, for example, a patient dreams of *removing* an attacker's hands from his wife's neck while he is in fact *throttling* her,<sup>74a</sup> then the possibility of nonisomorphic relationships is feasible. Nonisomorphisms might be explained as being caused by the partial atonia impinging on sleep behaviors leading to modification of the fictive movements associated with them.

The pathophysiology of altered dreaming in RBD may not be limited to the sleeping state. Evidence that patients with RBD suffer from deficits in perceptual-organizational processes<sup>82</sup> suggests a more generalized deficit that is linked to dreaming.<sup>83</sup> RBD patients also suffer from disrupted autonomic function during both sleep and waking,<sup>84</sup> a dysfunction that could well affect the emotional content of dreams.

In sum, the stereotypical nature of RBD dreams may be influenced by consistent pathophysiologic mechanisms that are unique to RBD but that may also affect the waking state. The latter suggestion is further supported by findings of RBD comorbidity with Parkinson's disease, particularly Parkinson's disease with waking or sleep-related hallucinations.

### Parkinson's Disease

RBD is now known to presage, often by many years, signs of Parkinson's disease and other synucleinopathic disorders (SNDs) such as dementia with Lewy bodies and multiple system atrophy.<sup>74</sup> About a third (33% to 39%) of patients with Parkinson's disease have RBD, and the proportion is much larger (58% to 64%) when probable cases (i.e., of those people who manifest REM sleep without atonia) are included.<sup>85,86</sup> Vivid dreams, nightmares, and other parasomnias such as nocturnal vocalization and dream enactment are frequent among patients with SND. Presence dreams have also been reported.<sup>87</sup>

Although the precise etiologic overlap between RBD and SND is still unclear, altered dreaming is more prevalent among those patients with SND who hallucinate, and it is possibly also implicated in the genesis of their hallucinations. In one study,<sup>88</sup> 61.3% of hallucinating patients with Parkinson's disease also experienced altered dreaming. In other studies,

Table 78-2. Specific Dreams and Behaviors\* of Patients with REM Sleep Behavior Disorder

| Author (Year)                              | Patient Description  | Dream Content  | Associated Dream-Enacting Behavior   |
|--|--|--|--|
| Mahowald and Schenck (2000) <sup>77</sup>  | Case 1: 77-year-old man  | Flying above some trees, he swoops down to answer a ringing phone on a table. As he lands, someone hits him and he jumps away  | Quickly bolted out of the bed into the hallway   |
| Boeve et al. (1998) <sup>112</sup>         | Male, unspecified<br>Patient 1: 70-year-old man with Lewy body dementia  | Defending wife from an aggressor<br>Running for a touchdown, spikes a football in the end zone   | Struck wife in bed<br>Held wife's head in headlock, moved legs as if running, exclaimed "I'm gonna make that touchdown!" and attempted to throw wife's head down toward foot of the bed  |
| Chiu et al. (1997) <sup>113</sup>          | Case 1: 72-year-old woman  | Defending herself against an enemy   | Grabbed neck of screaming granddaughter and tried to strangle her<br>Fell to ground and hit her head   |
| Morfis et al. (1997) <sup>114</sup>        | Case 2: 74-year-old man  | Had won a mahjong game, stood up, and walked away from table<br>Surrounded by snakes, had to roll down a slope to escape   | Lying on floor with bruises/lacerations on head and limbs  |
| Sforza et al. (1997) <sup>115</sup>        | 77-Year-old woman<br>61-Year-old man   | Standing in a garden, she leaned forward to pat a child on the head<br>Someone wanted to shoot him   | Standing on the bed, fell to the floor and received laceration to forehead<br>Talking and smiling, reaching for or picking up something, tried to sit up in bed screaming and sending someone away   |
| Coy (1996) <sup>116</sup>                  | 45-Year-old man with PTSD  | Saw Viet Cong soldiers in the trees outside house, then inside house; chased soldier   | Loaded a .22-caliber rifle, checked rooms, tripped over furniture and discharged weapon into his own foot  |
| Chung and Wong (1994) <sup>117</sup>       | 79-Year-old man  | Trying to stop his friends from beating their children<br>Being chased by a lion and screaming for help  | Flailed arms, screamed, moved vigorously<br>Screamed aloud during REM sleep  |
| Mahowald and Schenck (1990) <sup>118</sup> | MB: 73-year-old man with Parkinson's disease   | In military combat, enemy soldiers above him, aiming their weapons and shooting through a circle made by his arms; clasp his hands down into the ground, he sprang backward rapidly for safety   | Flew "over my night table about 4 feet and landed on the floor, cutting my left cheek just below the eye and causing a lengthy nosebleed."   |
| Culebras and Moore (1989) <sup>119</sup>   | Figure 7: 69-year-old man  | A man had approached him at a party, yanked off his bowtie, threw it in some mud, stomped on it, irritating the patient, who retaliated by throwing punches with his right arm   | PSG revealed right arm twitching, chin activation, activation of four limbs, body lifting, and repeated punching of the bedrail with the right arm; banging head on bedrail awakened patient.  |
| Sforza et al. (1988) <sup>120</sup>        | Patient 5: 70-year-old man, treated for diabetes and hypertension<br>Case 1: 62-year-old man with Shy-Drager syndrome<br>Case 5: 69-year-old man | To prevent an alligator from getting into his car, he held its snout with great force<br>Threw something at a bear to stop its chasing him<br>"I was being beaten by someone I had never seen before and I wanted to get away."<br>"I was dreaming of being caught and tied up by people who were going to beat me and I was terrified." | Woke up to wife's shouting as he was "strongly grabbing her arm"<br>Threw bed covers<br>Made protective hand and arm movements, leg movements, lifted head and neck with eyes closed as if to avoid or escape something, vocalized, made fearful, pained grimaces<br>Moved arms as if to tear someone away, then moved and raised arms and tried to lift legs; after 2 minutes, made sudden body jerks, raised arms in searching and reaching gestures with vocalizations; episode ended in sudden body jerk |

\*Summary of published instances of dreams by patients with REM sleep behavior disorder (RBD) for which a specific dream-enacting behavior was described as associated.

Abbreviations: PSG, polysomnography; PTSD, posttraumatic stress disorder; REM, rapid eye movement.

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the estimates were 59%<sup>89</sup> and 48%.<sup>90</sup> The presence of RBD is associated with the development of hallucinations, even independent of the severity of Parkinson's disease.<sup>91</sup> REM sleep mechanisms may be implicated in both dreams and hallucinations, as there are more REM sleep aberrations (e.g., fragmentation<sup>90</sup> and reduced percentage of time spent in REM sleep) among patients with Parkinson's disease who hallucinate than among those who do not.<sup>92</sup> PSG recordings of patients with Parkinson's disease have demonstrated that hallucinations and delirious episodes can correspond with brief daytime REM sleep episodes.<sup>93</sup> Moreover, sleep fragmentation and daytime dozing occur more frequently in patients with Parkinson's disease than in controls.<sup>89</sup> Hallucinations arising during sleep are also common (e.g., in 22% to 30% of cases<sup>94</sup>).

Although it is also true that drugs commonly used to treat patients with Parkinson's disease and other SNDs, especially dopaminergic agonists such as levodopa, may account for some of the alterations in dreaming,<sup>91</sup> they do not account for the majority of cases.<sup>87,95</sup> The prevalence of altered dreaming after long-term treatment with levodopa is only 31% (27 of 88),<sup>96</sup> and there is no difference in levodopa dosage between those who hallucinate and those who do not.<sup>95</sup>

### Epileptic Dream Stereotypy

Case studies<sup>2,97,98</sup> demonstrate stereotypy in the dreams of epilepsy patients in several ways. First, stereotypy is seen when epileptogenic features of seizures (such as auras, phosphenes, or ictal visual, auditory, and olfactory imagery) appear in recurrent nocturnal dreams. Second, it is seen in recurrent dream themes that appear in close proximity to seizures. Third, stereotypy is suggested by recurrent nightmares that precede seizures by substantial intervals.<sup>99</sup>

A laboratory case study has confirmed stereotyped dream content in epilepsy patients.<sup>97</sup> One patient reported in two of three recalled REM sleep dreams (out of 32 awakenings from REM sleep) telling someone else he was dying. A second patient reported that in two of three recalled REM sleep dreams (out of six awakenings) and in one of two end-of-night dreams (stage not specified), she was "on a board" going over water and afraid of falling. These themes were also present in the mental content of their epileptic seizures.

Recurrent dreams *unrelated* to the content of seizures have also been noted,<sup>99</sup> but such relationships are much more difficult to establish given the generally high prevalence of nightmarish typical dream themes in the population<sup>70</sup> and the predominance of fear as an ictal emotion.<sup>100</sup>

Dream stereotypy appears to parallel the discharge pathways active during epileptic seizures; the latter are stereotyped in expression but tend to change spontaneously over time.<sup>101</sup> Right hemisphere temporal structures might be a source of such patterning. A review<sup>2</sup> of 19 published epilepsy cases with recurrent nightmares and for whom localization information was available revealed right hemisphere involvement in 12 (63%), left hemisphere involvement in 2 (11%), and bilateral involvement in 5 (26%). REM sleep anomalies, such as rhythmic temporal epileptiform activity, may also be a source of dream stereotypy.<sup>97</sup>

Patients with temporal lobe epilepsy also display other types of dream disturbance. Dream impoverishment is suggested by the low recall rates (9%, 50%) of the two subjects in the

laboratory case studies mentioned earlier<sup>97</sup> and by the fact that, when awakened from REM sleep, they presented dreams with less frequent and less varied emotions. They also have more unpleasant, higher-intensity emotions than do controls,<sup>102</sup> a pattern reminiscent of PTSD (see next paragraphs). These dream disturbances are most likely not a function of medication, because medicated patients describe their dreams as being more vivid than do nonmedicated patients or controls.<sup>102</sup> Type of epileptic focus may play a role: patients with complex partial seizures recall more dreams than those with generalized seizures ( $P < .01$ ), independent of the side of the epileptic focus, the presence of brain lesion, and the presence or absence of seizures on the day of recall.<sup>103</sup>

### Reexperiencing Dreams in Posttraumatic Stress Disorder

The reexperiencing of a traumatic event through recurrent nightmares is a widely known feature of patients with PTSD. Patients with PTSD who experienced combat trauma are more likely to state that their nightmares exactly or almost exactly replicate an actual event than are those combat veterans with nightmares but no PTSD diagnosis.<sup>104</sup> To illustrate, one 45-year-old concentration camp survivor reported the same haunting dream (it repeated a traumatic persecution that he had experienced at the age of 6, over 39 years earlier) whether awakening spontaneously from REM or non-REM sleep or being awakened intentionally from REM sleep.<sup>105</sup> PTSD dreams are treated in more detail under "Dream Impoverishment," earlier, and in Chapter 46.

### Migraine Dreams

Dream stereotypy is prevalent among headache sufferers—particularly patients with migraine. An early study<sup>106</sup> of patients with migraine proposed criteria for defining three dream patterns that were so consistent as to be useful in diagnosis; these criteria included recurrence, presence of brilliant colors, occurrence at specific times of the patient's life, and particular emotional tones that carry over into waking and, in some cases, carry over as a hallucination. The three patterns defined were horrifying nightmares, nostalgic technicolor, and waking dreams. The latter pattern, in fact, is better described as sleep paralysis attacks, judging by the examples given.

Nightmares of terror were by far the most predominant theme in migraine cases, occurring in 61% of dreams. Other negative affects and themes (frustration, loss, incest, oversized creatures) also occurred. However, these findings are confounded by comorbid PTSD in at least two of the cases (accounting for 11 of the terror and 3 of the negative theme dreams). Negative affect often precedes migraines; migraine dreams contain significantly more anger, misfortune, apprehension, and aggressive interactions.

### Prodromal Cardiac Dreams

A form of stereotypy is seen in the recurrent themes of *prodromal* dreams—that is, dreams disturbed by ongoing or occult medical conditions. Such themes may even appear in dreams before any overt symptoms of the condition appear, a phenomenon that has been exploited (and often misunderstood) since the earliest days of medical science.<sup>107</sup> Prodromal dream themes have been proposed for a number of different



specific illnesses (e.g., gastrointestinal, pulmonary, gynecologic/obstetric, dental, arthritic).<sup>108</sup>

Studies of nonacute cardiac patients revealed a strong negative relationship between cardiac ejection fraction and dreamed death references (men) and separation references (women).<sup>109</sup> Additional cardiac dream themes can be either direct (e.g., wounds and/or pain or pressure in the arm, heart, chest, or neck), indirect (e.g., clutching or squeezing, references to death, blood, pain), or metaphoric (e.g., explosions) in nature.<sup>108</sup> Patients may present with near-fatal cardiac events following so-called killer dreams, although they had had no warning of a cardiac event (i.e., they had no cardiovascular risk factors).<sup>110</sup> To illustrate, a 23-year-old man awoke with crushing chest pain and had a cardiac arrest 1 hour later; before awakening, he had dreamed that he was murdered along with his father.

## TREATMENT CONSIDERATIONS

Because of the emotional, and often bizarre, nature of disturbed dreaming in many medical conditions, a patient's inclination to disclose them to health professionals, and thus the opportunity to provide treatment, is mitigated by various psychological, sociologic, and cultural factors. Expressive difficulties, such as alexithymia, may hinder self-disclosure. Many individuals may consider their dreams to directly or indirectly reflect their state of sanity or mental health and may avoid speaking openly about them. Others attribute a spiritual significance to dreams, believing them to originate in the workings of devils or evil spirits, or to signify a personal rupture with the sacred,<sup>111</sup> and may thus feel guilt, shame, or embarrassment in revealing dreams with taboo or incriminating content. Patients may be more likely to reveal problems with dreaming to sleep specialists because of their professed interest in sleep phenomena. Sensitivity to factors that influence patients' self-disclosures of disturbed dreaming—especially in multicultural settings—may facilitate the accurate diagnosis and treatment of associated sleep disorders.

Successful treatment also depends on proper identification of factors that may perturb sleep and dreaming. Close scrutiny of the medication regimen is important because of the many known and suspected agents that alter sleep and dream quality and whose replacement or dosage change could alleviate symptoms. Similarly, state variables such as stress and anxiety are amenable to short-term interventions that may diminish symptoms rapidly. Evaluation of sleep hygiene is also important to identify behaviors that lead to sleep deprivation and fragmentation, which are known to affect the quality of dreaming. Assessment of personality variables such as alexithymia or depression may also suggest avenues of therapeutic intervention. Many of these factors are amenable to cognitive behavior therapies, which are successful in treating nightmares and other, more common, dream disturbances.

## SUMMARY

Dreaming disturbances characterize a variety of medical conditions. These vary along a continuum of intensity from complete cessation of dreaming to total dream–reality confusion. In many cases, these disturbances appear to be aberrations of otherwise normal dream processes, such as recall, intensification, reality mimesis, or recurrence. Often, sleep fragmentation is implicated in the dream disturbance, but causal relationships

are not yet clear. Effective treatments are available for many of these disturbances.

### Clinical Pearl

*Assessment of changes in dreaming (including impoverishment and intensification) in a variety of sleep disorders and medical conditions may reveal serious comorbid symptoms (1) that negatively affect a patient's recovery and quality of life, (2) that may facilitate diagnosis, and (3) whose prompt treatment may aid long-term prognosis.*

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