

Disturbed Dreaming as a Factor in Medical Conditions

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Chapter 98

Abstract

Disturbed dreaming has been identified as a primary or secondary symptom in many medical conditions. The quality of such dreaming can be conveniently classified as varying along a continuum of subjective intensity. At one extreme, 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 other extreme, dreaming is profuse and vivid (excessive dreaming), affecting patients with epic dreaming, some brain lesions, and withdrawal from some medications, or it becomes so intense that it is confused with reality (dream-reality confusion) as is the case with bereavement or the postpartum state, intensive care unit (ICU) delirium, limbic

lobe damage, and psychotic states. Intense dreaming may become rigidly repetitive (repetitive dream content). Conditions such as rapid eye movement (REM) sleep behavior disorder with or without parkinsonism, epilepsy, PTSD, migraine, and cardiac illness are affected by dream repetition. The intensity dimension of dream disturbance appears to mirror various aberrations of dreaming's normal capacity to simulate reality. Accordingly, episodic memories, which are normally absent from dream content, appear more frequently in disturbed dreams. Although effective treatments are available for several common dream disturbances, the development of new treatments might benefit from attention to intensified reality simulation and the role of episodic memory activation.

Beyond common nightmares (see Chapter 97), dreaming disturbances appear as defining or comorbid symptoms of many medical conditions (Table 98-1). In this chapter, these disturbances are classified as falling along a continuum of increasing vividness or intensity, particularly of the apparent reality of the dream experience. At the lower extreme of this continuum, dream recall can cease or the realism of dream content can become impoverished in some respect. At the higher extreme, dream recall can become excessive or dream content unusually vivid and emotional, often being confused with reality or rigidly repetitive in structure. The full range of human emotions, be they dysphoric or euphoric, can appear in disturbed dreams (Fig. 98-1).

The intensity dimension of disturbance varies globally in how intensely real the dream experience appears. As described in the introduction to this section, reality simulation is widely viewed to be a basic function of the dream-production mechanism, approximating both the process and the contents of typical waking experience. One notable feature of this mechanism is the heightening of perception-like imagery or emotion to the point of equaling or exceeding what is normally perceived or felt during wakefulness. A second notable feature is the increased presence of episodic memory material in dream content. Such material is usually restricted to mere *fragments* of remembered (episodic) experience (see Chapter 55), but it can become more salient in replay nightmares (see Chapter 53), repetitive dreams, and so forth. Both of these features are likely in play during the most extremely intense dreams, such as those occurring in intensive care unit delirium or dream-reality confusion.

GLOBAL CESSATION OF DREAMING

About a third of patients with neurologic illnesses report having ceased dreaming altogether.¹ Solms¹ and Doricchi² report that parietal lobe involvement differentiates patients

with and without global cessation of dreaming (GCD); 42% of GCD patients have parietal lesions and an additional 7% have lesions in proximity to parietal lobe.¹ Frontal lobe lesions characterize some patients (8%) with GCD,¹ which is consistent with the reduced dream recall that follows upon frontal lobotomy³ (but see reference 2). An additional 43% of GCD patients have diffuse and non-localizable lesions.¹ It is noteworthy, however, that few such patients are subjected to rigorous REM sleep awakenings to determine whether the capacity for dream recall under optimal conditions is, in fact, absent. Such studies might reveal that many patients who appear to have GCD instead have dream impoverishment.

IMPOVERISHED DREAMING

Dream impoverishment is an attenuation, but not total cessation, in the recall, length, vividness, emotionality, or narrative complexity of dream imagery. Impoverished dreaming has been documented for some types of brain syndromes, for patients with alexithymia, and for patients with posttraumatic stress disorder (PTSD), who also have a high incidence of comorbid alexithymia.⁴

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%).⁵ In patients with Korsakoff's psychosis caused by chronic alcohol abuse, near-normal REM sleep time (29.4%) but poor dream recall (3%) is observed.⁶ Patients who have permanent amnesia for recent events due to mild encephalitis also have impoverished dreaming; the frequency of their REM awakening reports (28%) is less than normal (75%), and the reported dream content is simple, nonsymbolic and repetitious, stereotyped, and lacking in emotions and day residues.⁷ Impoverished dream recall has been noted

Table 98-1 Medical Conditions in which Dreaming is Disturbed

DISTURBANCE	CONDITIONS COMMONLY AFFECTED	ESSENTIAL FEATURES
Global cessation of dreaming	Neurologic illness Parietal lobe lesions Frontal lobotomy	Complete loss of dream recall; often sudden onset consequent upon illness or medical procedure
Impoverished dreaming	Brain syndromes Alexithymia PTSD	Reduction in recall, vividness, or complexity of dreaming
Excessive dreaming	Epic dreaming Brain damage Drug withdrawal	Dreaming seems to continue throughout the sleep period; can involve dream vivification or banal or repetitive dream content
Repetitive dream content	RBD /parkinsonism Epilepsy PTSD Migraine Cardiac disease	Frequent recurrence of repetitive or episodic memory content, e.g., features of prior trauma, epileptic aura, or cardiac symptoms
Dream–reality confusion	Bereavement Postpartum state ICU delirium Psychotic and near-psychotic states	Dream vivification; banal episodic content may be confused with actual events

ICU, intensive care unit; PTSD, posttraumatic stress disorder; RBD, REM sleep behavior disorder.

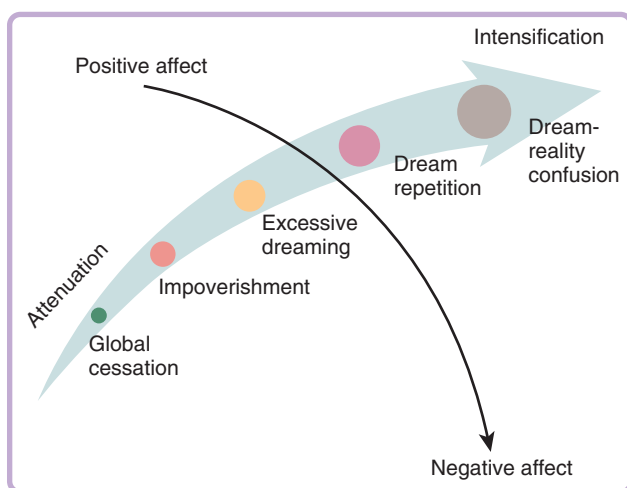


Figure 98-1 Dream disturbances may be conceptualized as falling along a continuum that captures variations in dreaming's natural capacity to simulate waking-state experiences of reality (see Chapter 51 for discussion). On the x-axis, disruption of reality simulation during dreaming varies from one extreme of attenuation, associated with cessation and impoverishment of dreaming, to the opposite extreme of intensification (vivification), associated with excessive dreaming, content repetition, and complete confusion of dreaming with reality. On the y-axis, the reality simulation capacity is largely independent of the emotions represented in the dream, which can vary from positive to neutral to negative. However, the intensity of dreamed emotions likely does co-vary with the intensification of reality simulation.

following left⁸ but not right⁹ hemispherectomy and supports the more general conclusion¹⁰ that left hemisphere processes are more critical for dream generation than are right hemisphere processes.

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 patients who have psychosomatic disor-

ders linked an alexithymic response style with diminished dream recall¹¹ and an absence of affect in dreams.¹² Reduced dream recall among alexithymic patients has since been replicated and linked with the difficulty identifying feelings subscale.^{13,14,14a} One study of subjects with nocturnal asthma¹⁵—a population in whom comorbid alexithymia is common—revealed that REM sleep awakenings produced an elevated incidence of impoverished dreaming, especially dreams reported with short sentences and the frequent impression of dreaming but without recall of specific contents.

Studies have reported evidence that specific sensory and structural features in dreams are impoverished among alexithymic patients. One study found that alexithymic patients reported colorless dreams¹⁶ and a second found that subjects with nonclinical alexithymia had less fantastic dream content than did controls but did not differ on other measures of dream recall and emotion.¹⁷

Sleep studies have not yet identified a consistent pattern of changes that might explain dream impoverishment. In one study,¹⁸ higher alexithymia scores were associated with more frequent REM episodes, shorter REM latencies, and more stage 1 sleep during and immediately after REM sleep. However, alexithymia was also related to increased NREM stage 1 and decreased NREM stages 3 and 4. In a second study,¹⁹ alexithymia scores did not correlate with *any* polysomnographic variable or with REM density; however, an association with shortened REM latencies was observed. Finally, alexithymia is reliably associated with certain sleep disorders, including chronic insomnia and parasomnias.¹⁶

In sum, although converging evidence indicates that dream impoverishment is associated with alexithymia, more research is needed to clarify relationships between alexithymic factors and various attributes of dream recall, content, and emotion and sleep polysomnography. It also bears noting that other patterns of disturbed dreaming characterize some alexithymic patients, such as dreams that are extremely macabre, nightmarish, or lacking in ego and

emotional control.²⁰ A similar paradoxical combination of both impoverished and nightmarish dreams is also found among some PTSD patients.

Impoverished Dreaming in PTSD

In contrast to the high prevalence of nightmares in PTSD (see Chapter 53), one long-term consequence of PTSD appears to be impoverishment of some dreaming attributes (for review see reference 21). Both home and laboratory studies indicate that PTSD patients have lower than normal levels of dream recall and that dreams tend to be brief, to deal with trivial daily events, and to be associated with paradoxically high REM densities.²² One laboratory study of disturbed dreamers found dream recall 42% to 54% of the time compared with 89% to 96% for controls.²² Similarly, a group of 12 “well-adjusted” PTSD patients had a lower dream-recall rate from REM sleep (33.7%) than did 11 less-adjusted (50.5%) and 10 control (80%) subjects.²³ Well-adjusted patients reported less complex, less salient dreams; fewer dreams with anxiety, aggression, and conflict; and higher denial of emotions toward their dreams.

In contrast, a few studies failed to demonstrate reduced dream recall in PTSD patients^{24,25} although one has reported that laboratory dream recall is *negatively* correlated with trauma severity.²⁵

Two, likely interrelated, explanations for these findings have been suggested. First, dream impoverishment in PTSD might reflect an adaptive response or strategy that reduces dream recall and thereby suppresses the occurrence of nightmares.²³ Second, mechanisms producing dream impoverishment in alexithymia might also be implicated in PTSD because of its high incidence of comorbidity with alexithymia⁴; up to 85% of PTSD patients may be alexithymic.²⁶ Hyperarousal and emotional numbing may be common to the etiologies of both conditions. Emotional numbing (considered equivalent to alexithymia in PTSD⁴) is best predicted by the number of hyperarousal symptoms in PTSD patients.²⁷ PTSD patients might expend so much cognitive, behavioral, and emotional effort on managing hyperarousal and reactivity that they exhaust their emotional resources including, possibly, a depletion of catecholamines.²⁸

EXCESSIVE DREAMING

Several conditions are characterized by dreams that are excessively abundant or intense. *Epic dreaming* refers to complaints of excessive dreaming combined with daytime fatigue.^{29,30} Patients complain of dreaming all night long about continuous physical activity, often of a banal nature, such as repetitive housework or endless walking through snow or mud. Sensations of acceleration or spinning are also reported. Such dreams occur nightly in 90% of affected patients, and comorbid nightmares are reported by 70%.²⁹ Unlike nightmares, however, epic dreams can lack vivid emotion altogether. The endless dreaming and feelings of fatigue can produce distress, which leads the dreamer to seek medical consultation. No clinical abnormalities have been observed, leaving its etiology and pathophysiology unclear. Cognitive, relaxation, and drug-based treatments and hypnosis have proved ineffective.²⁹ Comparative

studies of epic dreams and nightmares might clarify whether their repetitive motor imagery is a type of nightmare stripped of its emotions.

Excessive dreaming characterizes some patients with brain lesions¹ and includes increases in both dream frequency and vividness.³¹ Some patients also report dreaming the same content throughout the night, despite intervening episodes of wakefulness.^{1,31} Neuropsychological evidence suggests anterior limbic system involvement.

Excessive, vivid, and early-onset dreaming can also appear after withdrawal from certain medications such as tricyclic antidepressants³² and short half-life serotonin reuptake inhibitors such as paroxetine or fluvoxamine (see Chapter 48).³³

REPETITIVE DREAM CONTENT

Dream content repeats itself so often that a repetition dimension of dreaming has been postulated.³⁴ The recurring emotions and themes of nightmares and other typical dreams exemplify this. Here, I consider mainly dreams that occur in conjunction with a medical condition and for which their content, structure, or affective quality has become so highly repetitive that it causes patients distress. Neurobiological and psychological features of the concomitant medical condition are widely thought to shape the repetitive content of such dreams.

Assault and Defense Dreams in REM Sleep Behavior Disorder and Parkinsonism

REM sleep behavior disorder (RBD) is characterized by sleep-related motor activity that appears to enact the patient's ongoing dream or nightmare.^{35,36} Dream-enacting activities were reported by 93%, 87%, 82%, and 64% of patients in four large samples ($N = 93, 96, 91,$ and $52,$ respectively). Polysomnographic (PSG) evidence suggests that RBD patients do not enact all of their REM dreams, although their partial enactment is suggested by elevated levels of muscle tone (e.g., submentalis³⁷). Patients do not always recall dream content for specific episodes, possibly because most patients are elderly and have reduced dream recall or because some of the dreams lack salience. Nonetheless, a majority of patients report retrospectively that their dreams are more vivid, violent, action-filled, and nightmarish since the onset of their RBD.³⁸

Clonazepam suppresses dream-enacting behavior and the disturbing dreams accompanying them.³⁹ Pramipexole and melatonin have limited effects; melatonin appears to re-establish REM atonia.⁴⁰

Although a panoply of dream-enacting activities has been reported, associated dream themes are largely repetitive in their structure and emotional content.^{41,42} This is shown in Table 98-2, which summarizes examples of dreams for which specific enacting activities have been identified by authors. The most common repetitive pattern is that of imminent threat (29/37 or 78.4%), to which patients reacted with vigorous defensive actions (19/29 or 65.5%), attempts to escape (24.1%), or unspecified reactions (10.3%). Most threats (16/29 or 55.2%) were from humans; the rest were from animals (37.9%) or machines (6.9%). Six (6/37 or 16.2%) pleasurable dreams were also

Table 98-2 Summary of Published Accounts of Dream Enacting in REM Sleep Behavior Disorder

STUDY	SUBJECT	AGE (YR)	SEX	DIAGNOSIS	DREAM CONTENTS	DREAM-ENACTING ACTIVITIES
Fantini, 2009*	—	64	M	—	"I was on a bicycle and turned around; there was a dog. I was angry and scared because I thought he wanted to bite me. I started to chase him away by kicking him"	Kicking his wife, who woke him up
Schenck, 2005 ¹⁰¹	—	51	M	—	"In a car ... started to move backwards ... about to go down a ramp. I jumped out of the car to try to stop its movement [by pushing on it]"	Jumped out of bed and was pushing against the bed
—	—	65	M	—	"I was arguing and kicking this dog who was growling"	Kicked the wall so hard he put a big hole in it
—	—	75	M	—	"Something ... was moving and I struck out at it"	Kicked the poodle off the bed, causing it to yelp
—	—	72	M	—	Killing a 6-inch long cockroach	Stomping feet up and down on the bed
(same)	(same)	—	—	—	Playing volleyball	Sitting up in bed, pushing out his arms
(same)	(same)	—	—	—	Trying to run down the river	Kicking legs in the air
(same)	(same)	—	—	—	Ice skating with his father; his father fell and patient had to jump over him	Jumped out of bed, hitting and cutting cheekbone on nightstand
—	—	67	M	—	Trying to hit someone on the other side of a screen door who kept dodging his blows	Hit his wife with his fist
(same)	(same)	—	—	—	Walking down hall of a hospital, thought woman with bottle in hand was about to throw acid at him, went to throw himself through a door	Jumped out of bed
—	—	65	M	—	Wrestling with someone	Had wife in a headlock
(same)	(same)	—	—	—	Standing on the wing of an aircraft, hollered and dove off head-first to avoid being struck by the wing of a 2nd aircraft	Dove head-first over the end of the bed with blankets and pillows going with him; scraped head and ear against vanity
—	—	67	M	—	"A cat was biting me, and I was squeezing it"	Squeezed own armpit so tightly it turned black and blue next day
—	—	70	M	—	"Swimming, floating on my back and then decided ... to do ... a flip, under the water"	Fell out of bed and cut head
(same)	(same)	—	—	—	Being chased down a stairway, rounded a corner, tried to pivot around (like around a pole)	Grabbed lamp by bed and banged it down on his foot
(same)	(same)	—	—	—	Riding a bicycle, chased by a dog, tried to kick it in the shins	Kicking his wife
(same)	(same)	—	—	—	Tried to kick someone high up who had stolen backpacking gear	Kicked the wall and broke his big toe
—	—	74	M	—	Being chased by a big black dog	Got out of bed and ran into wall, hitting and cutting his eye
Boeve 2004 ¹⁰²	—	N/S	N/S	—	Fighting animals in a cave	Passenger on a commercial flight exhibited punching and kicking
Husain, 2001 ¹⁰³	—	62	M	—	Pleasurable dream of fishing	Sat on the edge of his bed as if holding a fishing pole
Mahowald, 2000 ⁴¹	Case 1	77	M	—	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
Mahowald, 2000	—	N/S	M	—	Defend wife from an aggressor	Struck wife in bed

Continued

Table 98-2 Summary of Published Accounts of Dream Enacting in REM Sleep Behavior Disorder—cont'd

STUDY	SUBJECT	AGE (YR)	SEX	DIAGNOSIS	DREAM CONTENTS	DREAM-ENACTING ACTIVITIES
Boeve, 1998 ¹⁰⁴	Patient 1	70	M	Lewy body disease	Running for a touchdown, spikes a football in the end zone	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, 1997 ¹⁰⁵	Case 1 (same)	72	F	—	Defending herself against an enemy Had won a mahjong game, stood up and walked away from table	Grabbed neck of screaming granddaughter and tried to strangle her Fell to ground and hit her head
Morfis, 1997 ¹⁰⁶	—	77	F	—	Surrounded by snakes, had to roll down a slope to escape Standing in a garden, she leaned forward to pat a child on the head	Lying on floor with bruises and lacerations on head and limbs Standing on the bed, fell to the floor, with laceration to forehead
Sforza, 1997 ¹⁰⁷	—	61	M	—	Someone wanted to shoot him	Talking and smiling, reaching for or picking up something, tried to sit up in bed screaming and sending someone away
Coy, 1996 ¹⁰⁸	—	45	M	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, 1994 ¹⁰⁹	—	79	M	—	Trying to stop his friends from beating their children Chased by a lion and screams for help	Flailed arms, screamed, moved vigorously Screamed aloud during REM sleep
Mahowald, 1990 ¹¹⁰	MB (same)	73	M	Parkinsonism	Being in military combat, enemy soldiers above him, aiming their weapons and shooting through a circle made by his arms and clasped hands down into the ground, he sprang backward rapidly for safety A man had approached him at a party, yanked off his bowtie, threw it in some mud, stamped on it, irritating the patient, who retaliated by throwing punches with his right arm	Patient had "flown 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" PSG revealed right arm twitching, chin activation, activation of four limbs, body lifting and repeated punching of the bed rail with the right arm, banging head on bed rail awakened patient
Culebras, 1989 ¹¹¹	Patient 5 (same)	70	M	Treated for diabetes and hypertension	To prevent an alligator from getting into his car, he holds its snout with great force Threw something at a bear to stop it from chasing him	Woke up to wife's shouting and "strongly grabbing her arm" Threw bed covers
Sforza, 1988 ¹¹²	Case 1 Case 5	62 69	M M	Sly-Drager syndrome —	I was being beaten by someone I had never seen before and I wanted to get away "I was dreaming of being caught and tied up by people who were going to beat me and I was terrified"	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 Moved arms as if to tear someone away, then moved and raised arms and tried to lift legs; after 2 min made sudden body jerks, raised arms in searching and reaching gestures with vocalizations; episode ended in sudden body jerk

*Personal communication, 2009

N/S, not stated; PSG, polysomnography; PTSD, posttraumatic stress disorder.

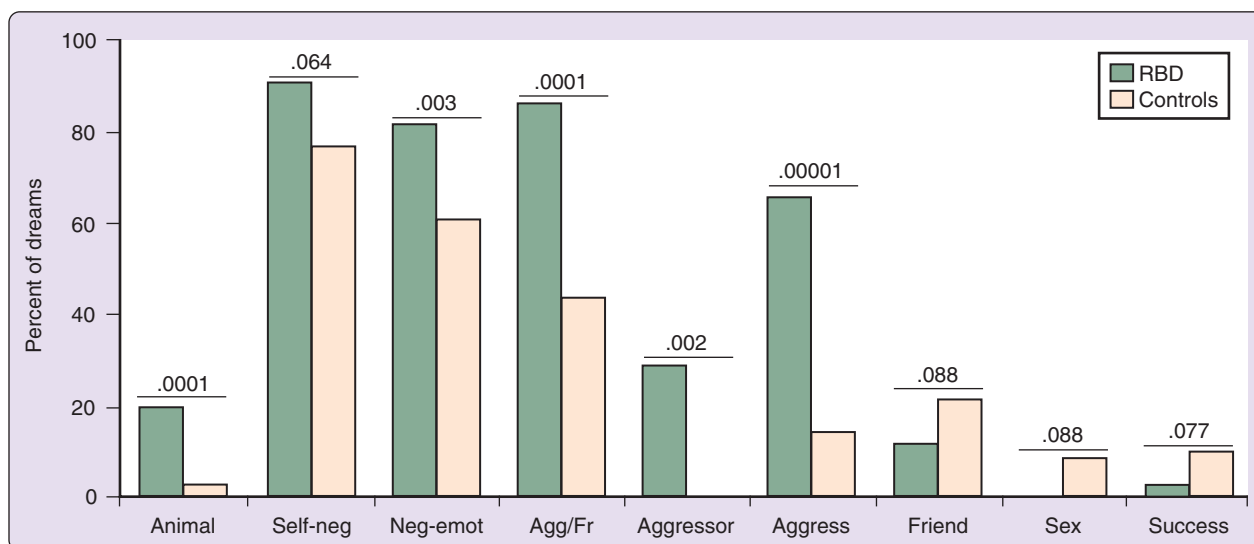


Figure 98-2 Dreams reported by 98 patients with REM sleep behavior disorder (RBD) exhibit more aggression and negativity and less prosocial behavior than dreams reported by 69 controls. Of nine content characteristics differentiating groups, RBD patients display more animal characters, self-negativity, negative emotions, aggressive versus friendly interactions, dreamer as aggressor, and dreams with at least one aggression. In contrast, they display fewer dreams with at least one friendly interaction, at least one sexual reference, and at least one success (From Fantini ML, Corona A, Clerici S, et al. Aggressive dream content without daytime aggressiveness in REM sleep behavior disorder. *Neurology* 2005;65:1010-1015).

Table 98-3 Dream Content Themes in Patients with Parkinson's Disease

DREAM CONTENT	RBD (N = 36)		NON-RBD (N = 84)	
	N	%	N	%
Chased by person	18	50.0*	7	8.3
Chased by animal	8	22.2	7	8.3
Defense against attack by person	14	38.9*	0	0.0
Defense against attack by person	4	8.3	1	1.2
Aggression by the dreamer	6	16.7*	1	1.2
Adventure or sports	6	16.7	9	10.7
Falling	10	27.8	17	20.2
Lost	8	22.2	15	17.9
Bizarre	3	8.3	5	6.0
Death	5	13.9	7	8.3
Enclosed space	8	22.2	16	19.0
Work related	9	25.0	18	21.4
Family or daily activity	16	44.4	38	45.2
Past	9	25.0	27	32.1
Vivid dreams	24	66.7*	34	40.5

RBD, REM sleep behavior disorder.

* $P < .01$.

From Borek LL, Kohn R, Friedman JH. Phenomenology of dreams in Parkinson's disease. *Mov Dis* 2007;22:198-202.

reported. Similar results have been reported for a sample of 37 RBD patients reporting dreams to their physicians⁴³: 89% were aggressive in nature and attacks were by humans for 57% of patients and by animals for 30%. Another study of RBD dream content (Table 98-3) reveals similar fractions (e.g., chase by humans, 50%; chase by animals, 22%).⁴⁴

Although RBD patients report more dreams with aggressive interactions (especially self as aggressor) than

do controls (Fig. 98-2), they do not have higher scores on a daytime Aggression Questionnaire; in fact, they score lower than controls on physical aggressiveness.⁴⁵ Dream aggression may be less prevalent for female RBD patients; compared with male RBD patients, their dreams are nonviolent, contain only fear (rather than anger and fear), and do not depict physical confrontation with an assailant.⁴⁴ Samples of women studied to date are small, however.

The repetitive nature of RBD attack and defense dreams remains a source of speculation. One possibility is that the dreams are intensified instances of the most typical dream type, pursuit or assault dreams.⁴⁶ Such intensification might result from increased levels of motor neuron activity or autonomic dysfunction. A growing literature links RBD with deficits in autonomic function, specifically, diffuse loss of innervation of cardiac sympathetic terminals⁴⁷ and reduced REM sleep cardiac variability.⁴⁸ Autonomic dysfunction might also explain patients' nonaggressive waking dispositions. Another possibility is that a neurodegenerative process underlying many cases of RBD leads to the release of archaic dream patterns such as aggression and animal characters (see Fig. 98-2).

It is also unknown how exactly RBD sleep activities reflect their associated dream contents. Reported dreams match activities in general respects (see Table 98-2), but in some cases dreamed and enacted actions differ subtly. For example, Schenck and Mahowald³⁸ report that male patients often dream about repulsing attackers who are threatening their wives only to find on awakening that they themselves are attacking their wives. Such errors resemble cases of somnambulistic violence; for example, a patient dreamed of *removing* an attacker's hands from his wife's neck while he was in fact *throttling* her. Analyses of dream contents with video-verified behavioral episodes are clearly needed to clarify this issue.

Parkinson's Disease

RBD is known to herald Parkinson's disease (PD) and other synucleinopathic disorders such as dementia with Lewy bodies (DLB) and multiple system atrophy (MSA) by up to several years.^{38,49} The presence of RBD among patients with PD is a risk factor for subsequent hallucinations,⁴⁹ and RBD with hallucinations can presage development of further cognitive impairments.⁵⁰

Accordingly, vivid dreams, nightmares, dream enactment, and other parasomnias are common among synucleinopathy patients. Because altered dreaming is more prevalent if hallucinations are also part of the clinical portrait, it is possible that dreaming is implicated in the etiology of synucleinopathic hallucinations. Estimates of comorbid hallucination and dreaming in patients with PD is relatively high (e.g., 61.3%, 59%, and 48% in three studies). Laterality of brain dysfunction in PD correlates with both dreaming and hallucinations; patients with right hemisphere dysfunction exhibit both nocturnal hallucinations and more vivid dreaming relative to those with left hemisphere dysfunction.⁵¹ That RBD may be associated with development of hallucinations independent of PD severity⁵² supports the notion that REM mechanisms are implicated in the expression of both dreams and hallucinations. So too does the fact that more REM aberrations (e.g., fragmentation,⁵³ reduced REM percentage⁵⁴) occur among PD patients with hallucinations than among those without hallucinations. In fact, PD hallucinations and delirium episodes often correspond with brief daytime REM sleep episodes.⁵⁵

Common treatments for Parkinson's disease and other synucleinopathies (e.g., levodopa) might account for some alterations in dreaming,⁵² but the prevalence of altered dreaming after long-term levodopa treatment is only

31%,⁵⁶ and dosage does not differ between patients who hallucinate and those who do not.⁵⁷

Dream Repetition in Epilepsy

Case studies^{1,58-60} demonstrate at least two ways episodic memories for seizure activity may be reflected during dreaming. First, epileptogenic features such as auras, phosphenes, or ictal imagery can appear in recurrent nocturnal dreams. Second, recurrent dream themes can appear in close proximity to later seizures.

One laboratory study illustrates repetition of dream content that had been present as mental content in epileptic seizures,⁵⁸ and thus might reflect episodic memories of those seizures. One patient reported in two of three recalled REM sleep dreams (out of 32 REM awakenings) and during seizures telling somebody else he was dying. A second patient reported in two of three recalled REM sleep dreams (six awakenings), in one of two end-of-night dreams (stage not specified), and in her seizures that she was "on a board" going over water and afraid of falling.

Repetitive dreams unrelated to seizure content but nonetheless related to the disease have also been discussed.⁶¹ However, the existence or importance of such dreams is difficult to discern given the high prevalence of nightmares and nightmarish dreams in the general population⁴⁶ and the predominance of fear as an ictal emotion.⁶²

Dream repetition might derive from the same discharge pathways active during epileptic seizures; activity in these pathways is stereotyped in expression but changes spontaneously over time.⁶³ Although one review of dream anomalies in epilepsy¹ suggests that right hemisphere temporal structures might be a source of such patterning (i.e., right hemisphere involvement in 63% of cases, left hemisphere involvement in 11% of cases, bilateral involvement in 26% of cases), a PSG study of right hemisphere and left hemisphere epilepsy cases⁶⁴ found few differences in dream content measures. REM sleep anomalies, such as rhythmic temporal epileptiform activity, might also be a source of dream repetition.⁵⁸

Patients with temporal lobe epilepsy also display other types of dream disturbance. Dream impoverishment is suggested by the fact that laboratory recall is "spotty and confused, short in length and poorly detailed" in some patients.^{65, p. 370} They also have more unpleasant and higher-intensity emotions than do controls,⁶⁶ a pattern reminiscent of PTSD (see next section). Type of epileptic focus might play a role in such disturbances: Patients with complex partial seizures recall dreams on more days (55%) than do those with generalized seizures (25%), independent of side of epileptic focus, presence of brain lesion, or presence or absence of seizures on the day of recall.⁶⁷ Medication use is also a potential confounder; medicated patients' dreams are more vivid than nonmedicated patients' or controls' dreams.⁶⁶

Re-experiencing Dreams in Posttraumatic Stress Disorder

A high proportion of PTSD patients report re-experiencing their traumatic events through recurrent nightmares (see Chapter 53). PTSD patients with combat trauma are more likely to state that their nightmares exactly or almost exactly replicate an actual event compared with combat

veterans who have nightmares but do not have a diagnosis of PTSD.⁶⁸ To illustrate, a 45-year-old concentration camp survivor reported the same dream of a traumatic persecution that he had experienced at the age of 6 years (4 decades earlier) regardless of the REM or NREM sleep stage he awoke from.⁶⁹ This re-experiencing phenomenon is one of the clearest examples of how episodic memories, normally minimized during dreaming, can become hyper-activated. Other aspects of PTSD dreams are treated in more detail in the earlier section “Impoverished Dreaming.”

Migraine Dreams

Dream repetition is prevalent among headache sufferers, particularly migraineurs. One study⁷⁰ proposed criteria for defining three highly consistent dream patterns (horrifying nightmares, nostalgic technicolor, waking dreams) that could be useful in diagnosis. Criteria included recurrence, brilliant colors, occurrence at specific times of the patient’s life, particular emotional tones that carry over into waking, and, occasionally, carry-over in the form of hallucinations.

Nightmares of terror are by far the most predominant theme (61% of dreams), although other dysphoric themes such as frustration, loss, incest, and oversized creatures also occur. Dreams that precede migraines contain more anger, misfortune, apprehension, and aggressive interactions than do dreams not preceding migraines.⁷¹

One source of the repetitive quality of migraine dreams may be similar to that in cases of epilepsy: The neurophysiologic activities underlying the pain and emotion that typically accompany migraine attacks shape the formation of dream content.

Prodromal Cardiac Dreams

A form of repetition is seen in the recurrent themes of *prodromal* dreams: dreams that are shaped by ongoing or occult medical conditions. Such dreams can manifest before overt symptoms appear, an occurrence that figured largely in the earliest days of medical science.⁷² Prodromal dream themes have been proposed for a number of specific illnesses, including gastrointestinal, pulmonary, gynecologic and obstetric, dental, and arthritic.⁷³

In the case of patients with nonacute cardiac conditions, prodromal dreams were identified to accompany heart

function. This appeared as negative relationships between cardiac ejection fraction on the one hand and dreamed death references in men and separation references in women.⁷⁴ A number of other cardiac-related dreams themes have been identified that are direct (e.g., 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.⁷³ Patients sometimes have “killer dreams” before the occurrence of near-fatal cardiac events, despite the absence of cardiovascular risk factors.⁷⁵ Some examples appear in Table 98-4. Among men and women who had nightmares very often, the percentages of patients possessing both irregular heart rhythm and spasmodic chest pain were three and seven times higher, respectively, than among those who had nightmares very seldom or never.⁷⁶

DREAM-REALITY CONFUSIONS

As dream imagery grows increasingly vivid and intense, it also appears to more closely approximate real sensorimotor and emotional experience (reality simulation) and confusion between dreaming and reality can result. This intensification is common for nightmares and sleep paralysis attacks. Four conditions are characterized by dream-reality confusions.

Existential Bereavement Dreams

One category of realistic dreams, referred to as *existential* dreams, often culminate in intensely real endings that can awaken the sleeper.⁷⁷ The heightened reality quality includes simulation of distressing emotions such as sadness, despair, or guilt; salient bodily feelings such as ineffectuality and paralysis; and failures in attaining goals. Themes often involve separation and loss and the appearance of deceased family figures. These distinguish existential dreams from typical nightmares. Their clinical importance is their appearance during bereavement, which involves a range of distressing emotions other than fear. Existential dreams are common for up to 5 years following a loss, whereas nightmares are more salient immediately after a loss.⁷⁸

Postpartum Infant Peril Dreams

Many new mothers experience vivid dreams of their infants in peril; the realism of these dreams is belied by the fact

Table 98-4 Prodromal Dream Themes in Patients Suffering Serious Cardiac Events

CASE	AGE (YR)	SEX	DREAM CONTENT	CARDIAC SYMPTOMS
1	23	M	Dream that he was murdered with his father	Awoke (6 AM) with crushing chest pain; cardiac arrest 1 hr later
2	38	M	Dream that he died in a car crash	Awoke (3 AM) with severe chest pain and vomiting; presented with acute myocardial infarction 2 hr later
3	42	F	Dreamed that she was running away from the police	Awoke (4 AM) with chest pain and shortness of breath; presented with acute myocardial infarction within 1 hr
4	52	M	Nightmare that his son, an illegal immigrant, died walking in the desert	Awoke (3 AM) with chest pains; total occlusion of right coronary artery

From Parmar MS, Luque-Coqui AF. Killer dreams. *Can J Cardiol* 1998;14:1389-1391.

that they are often accompanied by activities such as searching, calling out, or crying while the woman is asleep.⁷⁹ A common, highly realistic, theme that we have dubbed the BIB (baby-in-bed) dream type, is that the infant is lost in the bed and the mother, while still asleep, searches frantically for the child while crying, calling out in alarm, or touching her spouse. Peril dreams and sleep behavior are both prevalent and disturbing. Of women able to recall a dream of their infant, 63% report at least one peril dream associated with sleep behavior,⁷⁹ 41% report continuing anxiety after awakening, and 60% report needing to check on their infant. Sleep activities are predicted by self-reported sleep disruption and prior psychopathologic factors such as somnambulism, general psychopathology, and attachment disturbance.

Intensive Care Unit Dream Delirium

Dream intensification is reported by patients recovering from life-threatening conditions in the intensive care unit (ICU). They often report nightmares containing feelings of extreme horror, dread, or impending death and themes depicting their medical afflictions, agonizing treatments, isolation, dependency, and the real possibility of death. Many studies attest to their high prevalence, their alarming nature, and their potentially traumatizing long-term effects. For example, one 6-month follow-up study of 464 Portuguese ICU patients revealed that 51% recalled ICU dreams and nightmares.⁸⁰ Of these, 14% claimed that the dreams and nightmares continue to disturb daily life 6 months later and they scored lower than normal on a health-related quality-of-life measure. The phenomenon is illustrated by a nightmare from a patient residing in an ICU for 28 days following a peripheral artery bypass graft surgery: “The staff was trying to kill me first in the hospital and ultimately moved me to a basement. ... They were extracting my blood by force to sell it. ... I was in fear of dying ... I pleaded for my life.”^{81,p. 268}

Clearly, such dreams are potentially traumatic—especially if there is persistent confusion of the dreams with reality. One evaluation of traumatic ICU experiences in 80 patients with acute respiratory distress revealed that nightmares are the most commonly remembered trauma (64% patients).⁸² They are described as “bizarre and extremely terrifying” and far more common than anxiety (41%), pain (40%), or respiratory distress (38%). On follow-up,⁸³ ICU nightmares remain the most prevalent traumatic memory (75%) and predict the future development of PTSD.

Length of stay in the ICU is the strongest predictor of ICU nightmares.^{84,85} Of 127 patients in the ICU for longer than 1 day, 18.1% reported nightmares and reported 14.2% reported hallucinations; of the 162 staying less than 1 day, the corresponding figures were 2.5% and 0.6%.⁸⁵ Two thirds of patients premedicated with benzodiazepines later report postoperative dreams, and half of these are nightmares.⁸⁶ Other contributing factors include pain, anxiety, noise, the inability to lie comfortably in bed, mechanical ventilation, and female gender.⁸⁴

Vivid ICU dreams are part of the larger constellation of symptoms (e.g., delusions, hallucinations, disorientation, fluctuating consciousness)⁸⁷ referred to as *ICU delirium* (ICU psychosis, ICU syndrome) and whose prevalence varies considerably. A review of 26 studies⁸⁸ found an

average prevalence of 37% (range, 0% to 74%). Disturbed sleep can contribute to ICU dreams and to ICU psychosis more generally.⁸⁸ Depending on circumstance, such as mechanical ventilation, ICU patients might sleep only a couple of hours a day.⁸⁹ Their sleep displays extremely poor efficiency, with fragmentation, frequent arousals, prolonged sleep latencies, and a predominance of stages 1 and 2 over stages 3 and 4 or REM sleep.⁹⁰ Circadian rhythm of melatonin is typically abolished.⁹¹ Because stage 1 sleep can account for as much as 40% of total sleep time (versus 5% in controls⁸⁹), hypnagogic hallucinations may be more salient and enable vivid and frightening sleep-onset dreams.⁹² Guillain-Barré syndrome patients in the ICU who report dreamlike hallucinations also have disrupted sleep with frequent sleep-onset REM periods.⁹³

Psychotic Dream-Related Aggression

An extreme form of dream–reality confusion appears during psychotic episodes or among borderline psychotic patients. In fact, a hallmark of psychotic dreaming is the intensification of dreaming to the point that it is mistaken for reality and, during psychotic episodes, may be lived as a real event.⁹⁴ Realistic dreams can precede violent psychotic acts, and they occasionally seem to play a causal role. For example, an authoritative dreamed voice might command a crime, or a person might act aggressively in response to being murdered repeatedly in his or her dreams.^{95,96}

There are several reports of violent psychotic acts that follow from such extremely confusional dreams (see reference 97 for review). In one,⁹⁸ a 53-yr-old “deranged” man attacked 10 young children in a church cafeteria with knives: “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 told police that he heard the voice when awake as well. Hempel and colleagues⁹⁶ report five persons with psychotic dream-related aggression; two were charged with homicide and three with violent assaults. All were relatively young (27 to 43 years old), suffered from paranoid psychosis, and typically awakened from their dreams agitated and hostile. Hempel and colleagues propose *psychotic dream-related aggression* (PDRA) as a nosologic category that distinguishes it from somnambulistic violence and other parasomnias.

TREATMENT

The emotional—often bizarre—nature of disturbed dreaming in many conditions inclines patients toward reluctance in disclosing their dreams spontaneously to health professionals. It is also, unfortunately, the case that some medical practitioners do not fully appreciate the value of questioning patients about disturbed dreaming. Thus, opportunities for enhancing diagnosis and offering effective treatment may be lost. Additionally, effective patient–physician communication of dream disturbances may be mitigated by psychological, sociologic, and cultural factors. Some patients might have expressive difficulties, such as alexithymia, that hinder self-disclosure. Others might avoid speaking openly about dreams because they consider them to reflect a pathologic state of mind. Yet others may attribute spiritual significance to dreams,

believing them to originate in the workings of malevolent spirits or other sacred figures. Some patients might thus feel guilt, shame, or embarrassment in revealing dreams with taboo or incriminating contents. Sleep specialists, by the simple fact that they are interested in sleep phenomena, are in a privileged position to help such patients reveal their dream problems and achieve some measure of relief from them. Sensitivity to factors that influence patients' willingness to self-disclosure—especially within multicultural settings—can facilitate this goal.

Successful treatment also depends upon proper identification of factors responsible for disturbing sleep and dreaming. Close scrutiny of medication regimens is vital because many agents are known or strongly suspected to alter the quality of sleep and dreams. Discontinuing or replacing these medications or adjusting their dosage could alleviate symptoms effectively. Similarly, state stress and anxiety are amenable to short-term interventions that can diminish symptoms rapidly. Evaluation of a patient's sleep hygiene might also reveal behavior that produces sleep fragmentation and deprivation, both of which affect the quality of dreaming (see Chapter 52). Finally, personality variables such as alexithymia or depression are easily assessed and might suggest avenues for therapeutic intervention.

Such factors are often amenable to cognitive behavior therapies, which are largely successful in treating nightmares and related dream disturbances. However, new therapies are under development. Their efficacy might benefit by addressing anomalies of the reality-simulation function of dreaming (intensification of perception-like and emotional features, emergence of episodic material in dream content) as these appear in several forms of disturbed dreaming.

❖ Clinical Pearl

Assessment of changes in dreaming (including impoverishment or intensification) in a variety of medical conditions can reveal serious comorbid symptoms that can facilitate diagnosis and whose treatment can aid long-term prognosis.

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