

# Self-mutilation

## Impulsive traits, high pain threshold suggest new drug therapies

Pathologic self-mutilation is easy to recognize but difficult to understand and treat. Here's an in-depth look at this puzzling, sometimes horrifying behavior.

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**S**elf-mutilation has the power to confuse, frustrate, and frighten patients and their families. Psychiatrists, too, are not immune to the intense emotional responses that pathologic self-mutilation can provoke.

One definition of self-mutilation is any self-directed, repetitive behavior that causes physical injury.<sup>1</sup> Examples vary widely and include skin cutting, burning, or picking as well as head banging and extreme injuries such as auto enucleation. Most acts of self-mutilation are not suicide attempts but behaviors meant to express or release emotional turmoil.

As difficult as self-mutilation may be to understand, managing this condition may be even more complex. A multidisciplinary approach may be required, but evidence for the effectiveness of psycho- and pharmacotherapies is limited. This article reviews some theories of pathologic self-mutilation and describes emerging clinical strategies to treat it.

### Four types of self-mutilation

DSM-IV does not recognize self-mutilation as a separate disorder but sees it as a symptom of other psychiatric conditions.<sup>2,3</sup> It is briefly mentioned as one criterion for diagnosing borderline personality disorder (“recurrent suicidal behaviors, gestures or threats or self-mutilating behaviors”), and it



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also appears in the catch-all diagnosis of impulse control disorders, not otherwise specified (NOS). Other self-injurious behaviors such as substance use disorders, trichotillomania, and, in some respects, pathologic gambling have found their way into DSM-IV as addiction or impulse control disorders.

### Self-mutilation shares characteristics of impulse control disorders, including impulsivity and increasing tension prior to the act

Self-mutilation appears to fall between these diagnostic categories, as it contains elements of many psychiatric disorders, such as:

- loss of behavioral control
- repetitive actions despite negative consequences
- and clear dysregulation of thought and emotions.<sup>4</sup>

Self-mutilation presents in a variety of forms and encompasses many behaviors, from the socially acceptable to the bizarre and grotesque (*Table 1*). Favazza and Rosenthal described three main forms of pathologic self-mutilation.<sup>2,5</sup> A fourth form (such as ear piercing) is socially accepted and not considered pathologic.

- **Severe** self-mutilation manifests as extensive (and often irreversible) body damage. Examples include eye enu-

cleation, castration, or amputation. Intense psychotic states and intoxication from illicit substances—usually amphetamines—are the main causes of this relatively rare type, which fortunately is not frequently repeated.

- **Stereotyped** self-mutilation is self-directed physical injury (head banging, biting oneself) seen in mental retardation and developmental disorders. This type has a stereotyped and repetitive rhythm and presents in the clear context of a neurobiological insult.
- **Superficial** or moderate self-mutilation—seen most commonly in general psychiatric practice—includes skin cutting, burning, or picking by nonpsychotic, nonmentally retarded patients. The behavior tends to be repetitive. Patients with this type usually present with comorbid conditions, particularly personality disorders.
- **Socially accepted** self-mutilation includes ear piercing, tattoos, or culturally based behaviors, such as lip piercing or ear stretching seen in some African cultures.

#### An impulse control disorder?

Over the last 15 years, increasing evidence has suggested that pathologic self-mutilation may be an impulse control disorder.<sup>6</sup> Many clinical case reports demonstrate that self-mutilation shares two characteristics of impulse control disorders that involve such behaviors as gambling, sex, or stealing:

- failure to resist impulses/urges to participate in a particular behavior
- increasing tension or physical arousal before the act and release of pleasure or gratification after the act.

In the case report, “Pain from cutting makes me feel alive” (*Box, page 19*), the patient describes being unable to resist thoughts of cutting

continued on page 19

Table 1

### FOUR TYPES OF SELF-MUTILATION

Type	Example	Common causes
<b>Severe</b>	Eye enucleation, castration, amputation	Psychotic states, intoxicated states (especially with use of amphetamines)
<b>Stereotyped</b>	Head banging, biting	Mental retardation, Lesch-Nyhan syndrome, Tourette’s syndrome
<b>Superficial or moderate</b>	Skin cutting, burning, picking	Personality disorders secondary to axis I disorders, impulse control disorder
<b>Socially accepted</b>	Ear piercing, tattoos	Accepted cultural practices

Source: Adapted and reprinted with permission from Favazza AR, Rosenthal RJ. Diagnostic issues in self-mutilation. *Hosp Community Psychiatry* 1993;44(2):134-40.

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herself or to stop the behavior, despite knowing that she should. Self-mutilators also have been shown to have biological measures of impulsivity—namely decreased serotonin levels—similar to those seen with other impulse control disorders.<sup>7,8</sup> Finally, evidence is emerging that acts of self-mutilation are socially triggered expressions of impulsive psychological traits.<sup>5-7</sup>

### Risk factors

Accurate estimates of self-mutilation's incidence and prevalence are lacking, mainly because the behavior is difficult to define. In the U.S. population, Favazza estimated the prevalence as 0.75% and the incidence between 14 and 600 per 100,000 persons annually.<sup>5</sup> Known risk factors are:

- female gender
- adolescence and college age
- substance abuse and/or personality disorders
- history of self-mutilation<sup>3,9,10</sup> (Table 2).

Comorbidities such as depression, bipolar disorder, substance abuse, and schizophrenia are common. Axis II phenomena are common, especially the cluster B traits of histrionic, narcissistic, and borderline personalities.

Finally, little is known about the course of self-mutilation, but it tends to begin in adolescence and follows an episodic, recurrent pattern.<sup>11</sup> Reports are scant of self-mutilation in the elderly, although clinical experience tells us that it does occur in this age group.

### Causes

Several theories addressing the causes of self-mutilation have been championed. A few, with particular attention to impulse-control dysfunction, are described here.

**Biological contributions.** Support for a biological mechanism is beginning to emerge. Dysregulation in neurotransmission or neurobiological function may predispose a person to self-mutilate through the expression of impulsive traits such as motor disinhibition and a tendency to physical aggression.<sup>6</sup> Decreased serotonergic functioning or a central deficit in serotonergic functioning—as measured by platelet imipramine binding levels and serotonin metabolites in the

Box

## CASE REPORT

### 'PAIN FROM CUTTING MAKES ME FEEL ALIVE'

Mrs. K, age 39, is being treated for depression. She reports an onset of cutting behavior in college after she broke up with a boyfriend. She recalls being so agitated at the time that she instinctively grabbed a knife and began scraping her forearm. Since then, she has been cutting about three to four times a year and always in the context of an overwhelming stressful situation. So far, no serious medical consequences have resulted; she usually draws blood, then cleans and bandages the wound.

She is facing a divorce and is in a tumultuous battle with her estranged husband over custody of their children. As a result, her cutting behavior has increased in frequency to once or twice a week. These behaviors bother her, but she also reports that cutting allows her to “feel pain that makes me feel alive.” She denies suicidal intent. She wishes she could use another way to deal with emotional pain but finds herself yielding to cutting behaviors. Mrs. K has tried alcohol on some occasions and thought about using illicit drugs but did not know how to get them.

One of the reasons she sought treatment was to reduce her cutting behaviors. She feels that she can't control her behavior and wants to understand why she repetitively chooses to engage in it.



CSF—are seen in self-mutilators and persons with other impulsive behaviors, such as completed suicide, physical aggression, and pathological gambling.<sup>11,12</sup>

Self-mutilators also respond abnormally to infusions of the adrenergic agent fenfluramine—they show decreased release of prolactin, which signals reduced serotonergic function.<sup>11,12</sup> Reports of a blunted serotonergic response in patients who attempt suicide and in those who complete a self-mutilation act strengthen this theory of a biological contribution.<sup>12</sup>

Finally, in examining the relationship of impulsivity and serotonergic function, Herpertz found a link between trait impulsivity—as measured by a deficit in problem-solving ability and affective hyperreactivity—and low serotonergic function.<sup>6</sup> What remains unclear, however, is cause and effect: do impulsivity traits cause serotonergic dysfunction, or do serotonin function deficits manifest as impulsivity?

continued



Table 2

## PROFILE OF PATHOLOGIC SELF-MUTILATORS

- See themselves as isolated and disconnected from the world
- History of physical or sexual abuse
- May come from chaotic family environments
- Comorbid axis I or II disorders, especially depression, borderline personality disorder, and substance abuse
- Low self-esteem; inability to cope with negative emotions, life situations
- Usually female
- Hopelessness
- Impulsivity
- Usually ages 16 to 30
- Self-mutilation behavior waxes and wanes

In one fascinating study, self-mutilators whose primary diagnosis was borderline personality disorder tolerated more physical pain than did healthy controls.<sup>7</sup> When they were tested during a distressed state of mind, self-mutilators' pain thresholds were even more elevated. This finding suggests alterations in the opiate systems and stress-response pathways.

Further work—including genetic studies and functional neuroimaging—is needed to better understand the neurobiological locus of pathologic self-mutilation.

**Psychological contributions.** Self-mutilation may represent a compromise between choosing life or death. Some analysts have viewed self-mutilation as a coping mechanism to avoid suicide.<sup>1,13</sup> In other words, self-mutilation is the expression of psychic pain turned outward but without the intent to end life. Self-mutilation may then be viewed as a way to concretely demonstrate negative affective states to the self and to the world. It also may serve as a tool to regulate and cope with these negative affective states.

Unfortunately, this coping behavior can become irresistible and psychologically tempting. One self-mutilator writes, "It's like a relief; I do it [cutting on her wrists] every couple of weeks, just to get relief . . . from pressure that builds

up inside . . . you feel like you're going to explode if you don't cut."<sup>1</sup> The described rise in tension is reminiscent of other impulse control disorders.

Hyperreactivity of decision-making also is correlated with self-mutilation, as it is with impulse-control disorders. Impulsive people tend to respond very quickly to environmental stimuli, rather than suppressing physical and emotional responses.<sup>6</sup> One behavioral definition of impulsivity is the tendency to choose smaller, more immediate rewards instead of larger, delayed rewards. In the case report presented earlier, Mrs. K chose to cut her wrists instead of waiting for the negative affective state to pass. Waiting—which would have taken more time—would have offered the obvious benefit of avoiding physical harm.

**Social contributions.** The act of self-mutilation typically grabs the attention of a therapist, friends, or spouses. Operant conditioning—where the positive rewards of help, empathy, and attention follow self-mutilation—may reinforce and perpetuate the behavior.<sup>1</sup> Other social contributions may include:

- dysfunctional family systems
- lack of social support
- poor communication skills
- role expectations, such as school/work performance, sexuality, or career obligations.<sup>13</sup>

When social pressures demand immediate decisions, impulsive self-mutilators may feel an urgency to act instead of using other coping mechanisms. Leibenluft et al published what may be the only empiric study that addresses

### Common comorbidities include depression, bipolar disorder, substance abuse, and borderline personality disorder

this "inner experience" of the self-mutilator with borderline personality disorder.<sup>14</sup> In our case example, the pressures of an imminent divorce trial triggered Mrs. K's most recent cutting behavior. She did not have a strong support system and—in her desperation to control something—she resorted to cutting.

## Pharmacologic treatment

Just as the cause of self-mutilation is multidimensional, so is its treatment. Research has focused on medications, individual therapy, and social therapy. Not surprisingly, these approaches resemble the treatment of other impulse control disorders.

Most of the evidence for drug treatment of self-mutilation comes from case reports and small open-label studies. A variety of medication classes have been tried.

**Antidepressants.** In theory, if reduced serotonin neurotransmission helps drive pathologic self-mutilation, then using selective serotonin reuptake inhibitors (SSRIs) to increase serotonin availability may reduce impulsivity. For example, Velazquez described the case of an 11-year-old boy whose finger-chewing behavior diminished with fluoxetine therapy.<sup>15</sup>

Most of the SSRI studies have examined self-mutilation in the context of treating personality disorders, especially borderline personality disorder. SSRIs have been shown to modestly reduce anger and negative affective states, but the studies do not refer specifically to their effect on the frequency of self-mutilation. Given the present evidence, SSRIs appear to be an appropriate first-line treatment for self-mutilation because of their:

- overall safety profile
- effectiveness in treating mood lability and reactivity
- documented deficits in serotonergic neurotransmission.

Still, little empiric data exists regarding their use in treating self-mutilation, and prescribers should watch for possible side effects. No SSRI appears to be best suited to treat this disorder. Base initial selection on prior medication trials and on whether a drug's side effects could work in the patient's favor. For example, paroxetine's more sedating properties may benefit a patient with difficulty sleeping, whereas sertraline's more activating properties may help the lethargic patient with psychomotor retardation.

**Atypical antipsychotics** are often used in patients with borderline personality disorders or mental retardation to reduce impulsive physical aggression and mood lability. Their wide range of pharmacologic effects—including serotonin and dopamine blockade—suggests why they may have thymoleptic properties related to mood, anxiety, impulsiveness, and overall behavioral control. Small trials have demonstrated

that olanzapine and clozapine may help control self-mutilation,<sup>16,17</sup> but controlled trials are lacking.

**Mood stabilizers.** Case reports have described use of lithium, divalproex, and topiramate to reduce the frequency of self-mutilation, but—as with antipsychotics—controlled studies are lacking.<sup>18</sup> Mood stabilizers are appropriate in self-mutilators with co-existing bipolar disorder and possibly in those

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whose self-mutilation has cycling or circadian properties.

**Anxiolytics.** The sedative effects of benzodiazepines such as lorazepam or clonazepam may help control agitation and attempts to self-mutilate in emergent inpatient settings. This drug class carries a high abuse potential and may cause behavioral disinhibition, especially with mentally retarded patients. These properties limit benzodiazepines' usefulness in outpatient treatment of self-mutilation.

**Opiate antagonists.** Naltrexone and nalmefene have been shown to be effective in other impulse control disorders, such

### Box 2

## FIVE PRINCIPLES OF DRUG MANAGEMENT OF SELF-MUTILATION

- **Use** medications to lay the groundwork for psychosocial interventions. When mood and thought are stabilized, patients can think more clearly and be more receptive to therapy.
- **Consider** SSRIs as a first-line approach, followed by atypical antipsychotics, mood stabilizers, and typical antipsychotics. Target doses may vary; some patients respond to lower antipsychotic doses than are used for psychotic disorders.
- **Choose** medications to target co-existing symptoms, such as insomnia, heightened arousal states, and behavioral agitation.
- **Discuss** the limitations of medications with patients and families, so that their expectations are realistic and do not impede recovery.
- **Monitor** prescriptions closely; self-injuring patients are impulsive and at risk for unintentional (or intentional) overdose.



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as pathologic gambling and kleptomania.<sup>19,20</sup> In self-mutilation, the use of opiate antagonists has been limited to case reports in patients with autism or mental retardation.

Although unproven, it may be that self-injurious behaviors are reinforced by a release of endogenous opioids. In the-

### Self-mutilators may tolerate greater pain levels than normal, perhaps because of altered opiate systems and stress response

ory, then, blocking opiate release would reduce the behaviors, as patients would then respond more normally to pain. The behavior would extinguish without the reward.<sup>19,20</sup>

Opiate antagonists, which purportedly reduce urges and cravings to drink or to gamble, may also block urges and cravings to self-mutilate. Problems with using these agents include the need for periodic liver function tests and side effects such as nausea and gastrointestinal disturbances.

#### Psychotherapeutic approaches

Psychodynamic psychotherapy is the most common form of individual therapy used in treating self-mutilation. Effective therapy enables patients to understand why they self-mutilate and teaches them more healthy ways to deal with negative internal states.<sup>2,3</sup>

Individual therapy is the mainstay of self-mutilation treatment, although no known studies have confirmed that psychodynamic psychotherapy reduces acts of self-mutilation. Because self-mutilators tend to have poor boundaries, supervision and peer collaboration are highly recommended to maintain an effective therapeutic relationship.<sup>1</sup>

Yet to be answered is whether healthier coping strategies alter measures of impulsivity. Patients who have improved report they are better able to cope with negative affective states and to verbalize their feelings.

Dialectical behavior therapy (DBT) is another psychotherapeutic option. Used in treating personality disorders, DBT combines cognitive, behavioral, and supportive interventions. In one study, DBT reduced the frequency of self-mutilation to 1.5 acts per year, compared with 9 acts per year in a treatment-as-usual control group.<sup>21</sup>

#### Need for 'emergency plans'

Relaxation training, exposure therapy, and response prevention have been suggested as treatments for pathologic self-mutilation, but there is no convincing evidence to support their efficacy.<sup>1</sup> Contracts against self-mutilation do not appear to be effective. Instead, "emergency plans" may be needed to deal with urges to self-mutilate.

Crisis intervention strategies that may help the self-mutilator include:

- partial hospitalizations to focus on increasing coping skills and strengthening a patient's sense of self-reliance and individual responsibility
- increased frequency of visits
- educating the patient to use medications such as atypical neuroleptics or benzodiazepines as needed ("in case of emergency, take this medication instead of cutting").

Crisis interventions should focus on understanding and changing pathologic behaviors. Self-mutilation behavior may be reinforced if attention is given without enough emphasis on developing coping skills.

Group therapy may be another treatment option. Group support helps patients with pathologic gambling, addictive, or other impulse control disorders to prevent relapse and learn to deal with urges and impulses.

**S**elf-mutilation often co-exists with other psychopathologies, such as depression or borderline personality disorder. The behavior has characteristics similar to those of impulse control disorders. Empiric evidence suggests that SSRIs and other medications, along with psychotherapy, may be the most effective treatments.

**BottomLine**

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### Related resources

- ▶ Self-injury Web site offering information about self-harming behavior plus coping skills, alternatives to self-injury, support groups. [www.selfabuse.com](http://www.selfabuse.com)
- ▶ Levenkron S. *Cutting: understanding and overcoming self-mutilation*. New York: WW Norton and Company Ltd, 1998.
- ▶ SAFE (Self-Abuse Finally Ends), [www.selfinjury.com](http://www.selfinjury.com). Resources for patients, families, and therapists. Recording at 1-800-DON'T-CUT (800-366-8288) offers to mail information on self-injury and the SAFE Alternatives program.

### DRUG BRAND NAMES

Clonazepam • Klonopin	Nalmefene • Revex
Clozapine • Clozaril	Olanzapine • Zyprexa
Fluoxetine • Prozac	Paroxetine • Paxil
Lorazepam • Ativan	Sertraline • Zoloft
Naltrexone • ReVia	Topiramate • Topamax

### DISCLOSURE

Dr. Fong reports no financial relationship with any company whose products are mentioned in this article or with manufacturers of competing products.

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