

Impulsivity in Childhood

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Abstract

This chapter discusses impulse control disorders in children 12 years of age and younger. In this age group, the available research focuses on fire setting/pyromania, trichotillomania, and pathological gambling. Less well studied are kleptomania, intermittent explosive disorder, and the impulse control disorder not otherwise specified, pathological skin picking. Clinical presentation, diagnosis, epidemiology, age of onset, risk factors, sociocultural factors, and comorbidity will be reviewed. Psychotherapeutic interventions for the age group will be explored, with particular emphasis on behavioral therapy. The available literature on psychopharmacological treatments, particularly selective serotonin reuptake inhibitors and opioid antagonists, will also be explored.

Keywords: children, fire setting, pyromania, trichotillomania, pathological gambling, kleptomania, intermittent explosive disorder, impulse control disorder, pathological skin picking, selective serotonin reuptake inhibitor, naltrexone

Introduction

The personality dimension impulsivity is central to many behavioral disorders of children and adults. Impulsive actions “appear poorly conceived, prematurely expressed, unduly risky, or inappropriate to the situation and . . . often result in undesirable consequences” (Daruna & Barnes, 1993, p. 23). Global excessive impulsivity in childhood is a defining feature, along with hyperactivity and inattention, of common attention-deficit/hyperactivity disorder (ADHD). In contrast, the less frequent childhood impulse control disorders (ICDs) are characterized by failure to resist focal maladaptive impulses, such as the urge to set a fire or pull out hair. Typically, increasing tension or arousal precedes, and is relieved by, the impulsive act in an ICD, although children may be less likely to endorse this tension/relief pattern. While negative consequences follow the impulsive act, such as property damage, financial loss, or personal injury, patients with ICDs persist in their maladaptive behaviors. The

ICDs have been conceptualized as existing on an impulsive-compulsive spectrum of psychiatric disorders (McElroy et al., 1992). Some DSM-IV-TR ICDs resemble more classic impulsive, externalizing disorders or addictions in symptomatology and may be associated with comorbid conduct disorder or ADHD. These ICDs include intermittent explosive disorder, pathological gambling, pyromania, and kleptomania. Pathological grooming ICDs, however, appear to lie closer to compulsive disorders on the impulsive-compulsive spectrum; these ICDs include trichotillomania and pathological skin picking, the latter an impulse control disorder not otherwise specified.

Typically, ICDs first appear in adolescence. In adult studies, ICDs are more common in adult men than women, with the exception of trichotillomania, which predominates in females. Adult treatment studies have investigated selective serotonin reuptake inhibitors (SSRIs), mood stabilizers, and opioid antagonists, as well as cognitive-behavioral

therapies, for the ICDs, with trichotillomania and pathological gambling receiving the most research attention (Dell'Osso et al., 2006).

This chapter focuses on the English-language literature from the last 20 years regarding childhood ICDs. Data, where available, regarding epidemiology, comorbidity, family and societal risk factors, and treatment will be reviewed for each ICD. Studies focusing on adolescents and adults are reviewed in other chapters.

Pyromania and Fire Setting

Like other ICDs, pyromania is associated with rising tension before the act of fire setting, followed by relief or pleasure after setting the fire or watching its aftermath. According to the DSM-IV-TR, individuals with pyromania must have set fires deliberately on multiple occasions and have exhibited fascination, interest, or curiosity about fire. This fire setting should not be done for secondary gain or political purposes. Pyromania is not diagnosed if fire setting is better accounted for by diagnoses of conduct disorder, mania, or antisocial personality disorder (American Psychiatric Association, 2000).

Pyromania is rarely diagnosed in children. In one case series of 250 pediatric fire setters, only 4 were found to meet criteria for pyromania (Sakheim & Osborn, 1999). Rising tension and relief are often not reported in juveniles who set fires repeatedly; in addition, many of the juveniles who set fires repeatedly meet criteria for conduct disorder and thus are excluded from the diagnosis of pyromania. In a series of child psychiatric outpatients, only 6.5% of juvenile fire setters met pyromania criteria, while 64.5% met criteria for conduct disorder (Heath et al., 1985).

However, while pyromania may be an uncommon pediatric diagnosis, juvenile fire setting is common and dangerous. In the United States, 49% of arsonists arrested are under the age of 18, the highest juvenile percentage among the serious crimes. In 2006, 9.1% of people arrested for arson in the United States were between 10 and 12 years old (FBI, 2006). Juvenile fire setting is similarly problematic across the world. Twenty percent of Australian fires were attributed to juveniles in a Queensland Fire and Rescue Service report (as cited in Dadds & Fraser, 2006). The average structural damage from a juvenile fire exceeded \$US20,000 in 2006 (FBI, 2006). Children are the primary victims of juvenile-set fires and comprise 85% of lives lost in those fires (U.S. Fire Administration, as cited in

Putnam & Kirkpatrick, 2005). Most pediatric fire injuries and deaths are directly related to the child's own involvement in the fire (Hall, 2000).

Childhood fire behaviors have been divided into fire play and intentional fire setting. Fire play is motivated by curiosity, such as playing with matches or lighters. Fire play has been reported in a large minority of children, including 45% of boys evaluated in kindergarten, second, or fourth grade, approximately ages 5, 8, and 10 years (Kafry, 1980). Unfortunately, in one-third of first fire play episodes, flames spread beyond the source of ignition, the match or the cigarette lighter, and cause fires. Eighteen percent of these fires are ignited by children under the age of 3 years. Very young children may be particularly likely to set dangerous fires because they lack awareness of combustibility and how to handle emergencies; they may hide after igniting a fire, increasing the risk of smoke inhalation and burn injuries (Kafry, 1980).

Unlike simple fire play, fire setting involves "systematic gathering of flammable materials with the fire being directed at a clearly defined target, either person or property, with anger or revenge as the most commonly reported motives" (Adler et al., 1994, p. 1195). The remainder of this section will focus on pediatric fire setting.

Prevalence and Gender

Large-scale prevalence studies of fire-setting behaviors in nonclinical samples of juveniles demonstrate male predominance across age groups. In a recent Italian study, 29% of 567 11- to 18-year-olds reported that they had set fires; 40% endorsed setting multiple fires. Boys were significantly more likely to set fires than girls, with 80% of those reporting fire setting being male (Del Bove et al., 2008). In a study of 1359 4- to 9-year-olds in Brisbane, Australia, boys were significantly more likely to report fire interest and match play than girls. Increasing age in boys, but not in girls, was significantly associated with match play, with match play rising from 2.5% of 4- to 6-year-old to 6.5% of 7- to 9-year-old boys (Dadds & Fraser, 2006). In a clinical sample, 18.9% of outpatients at a child guidance clinic had set fires, all of whom were male (Fitzgerald & O'Hanlon, 1991).

Comorbidity

Comorbidity with conduct disorder (CD) is frequent in pediatric fire setters. Conduct disorder was significantly more common in fire-setting children (31.3%) versus nonfiresetters (6.6%) in a study of

6- to 12-year-old children experiencing domestic violence (Becker et al., 2004). Living in a violent home also significantly increased the risk of cruelty to animals, while other factors such as sexual abuse did not influence either cruelty or fire setting. Even higher rates of CD, 53.3%–75%, are reported in outpatient and inpatient clinical samples of juvenile fire setters (Fitzgerald & O'Hanlon, 1991; Heath et al., 1985; Kazdin & Kolko, 1986; Kuhnley et al., 1982).

Attention-deficit/hyperactivity disorder is less commonly reported as a comorbid condition with fire setting. It was reported in none of 32 fire-setting pediatric outpatients, 16.1% of fire-setting pediatric inpatients, and 17% of children remanded to a fire-setting treatment program; in the first two series, CD was much more frequent (Franklin et al., 2002; Heath et al., 1985; Kuhnley et al., 1982). Untreated ADHD may increase the risk of burn injury to children. In a retrospective case series, 0.5% of pediatric burn unit patients had ADHD. While they composed a very small percentage of the children in the burn unit, their behaviors leading to the burns were particularly dangerous. Half of the patients with ADHD had engaged in impulsive fire play, often using a flammable liquid or aerosol can with the ignition source; 42.8% of the children were off medication when they burned themselves (Thomas et al., 2004).

An unusual apparently comorbid condition is Klinefelter syndrome, leading one group to recommend chromosomal analysis for young male arsonists (Kaler et al., 1989). At least four cases of fire setting have been reported in children with Klinefelter syndrome. One of these boys stopped setting fires after treatment for Klinefelter syndrome with testosterone (Miller & Sulkes, 1988). Even less common is coincident fire setting and photosensitive epilepsy, reported in a father and his young daughter. The daughter's fire setting, present since infancy, declined markedly after she was required to remain at least 3 meters away from the television set and was treated with anticonvulsants (Meinhard et al., 1988).

Motivation and Recidivism

Motivations for fire setting have been studied in children in order to clarify risk factors for recidivism and to target treatment. Fire setters have been subtyped, for instance, into low-risk *curious* fire setters, who lack motivation and set a fire during a lapse in adult supervision, versus higher-risk *thought-disordered*, *delinquent*, *thrill-seeking*, *revenge-based*, *compulsive/pyromaniac*, or the highest-risk

disordered-coping subtype. The last group uses fire setting as a way to respond to "any assault on the ego that produces emotional discomfort" (Williams & Clements, 2007, p. 69). This clinical model has not been subject to robust research verification.

In studies, excitement and thrill seeking are frequent motivations for children who set fires; finding fire exciting may be a risk factor for more severe and recurrent fire setting. Thrill seeking was significantly associated with fire setting in a study of 4- to 9-year-olds (Dadds & Fraser, 2006). In a study of 186 juvenile fire setters, most of whom were 12 years of age or younger, children often cited multiple motivating factors. The most popular motivations were curiosity (49%), excitement (30%), and revenge (17%; Showers & Pickrell, 1987). When Sakheim, Osborn, and Abrams (1991) compared children who had engaged in severe (deliberate, planned, persistent) fire setting to those who had engaged in minor fire setting, they found that almost half of the severe fire setters were excited by fire, but none of the minor fire setters were. In a later study, they found that minor fire setters were significantly more likely to experience guilt over fire setting than major fire setters (Sackheim & Osborn, 1999). Heightened interest in fire was a significant predictor of recidivism among 192 children and adolescents who completed the Fire Interest Interview (McKay et al., 2006).

Motivation may also predict fire-setting sites. In one study, fire setters motivated by revenge were more likely to set fires at home. Those motivated by excitement set fewer home fires, instead setting fires on public wastelands in groups, running through the fires to increase excitement (Fitzgerald & O'Hanlon, 1991). Similarly, group fire setting was endorsed by slightly more than half of 95 children who completed the Fire Incident Analysis for Children interview (Kolko & Kazdin, 1994). The most common motivation for setting fires was "playing around" or having fun; older children were more likely to endorse motivations of anger or revenge.

Parental Features

Many investigators have expressed concern about parental indifference to pediatric fire setting. In some studies, a substantial minority of parents, roughly 25%, has been unaware of the fire involvement of their children (Del Bove et al., 2008; Kolko & Kazdin, 1994). In an outpatient study, few parents of fire setters spontaneously reported fire setting as a symptom of concern, not volunteering information

about fire setting unless specifically asked (Fitzgerald & O'Hanlon, 1991). Severe pediatric fire setting has been associated with lack of parental response to previous fire setting (Kolko & Kazdin, 1994). Other juvenile fire setters may be particularly vulnerable to fire setting, not because their parents are unmoved by the fires, but because they are absent. A study of incarcerated children found that the fire-setting detainees were significantly less likely to have a mother living in their home than other detainees (Ritvo et al., 1983).

Other studies have focused on parental psychopathology and styles of discipline. Mothers of inpatient pediatric fire setters, compared to mothers of other psychiatric inpatients, endorsed more personal psychiatric symptoms and depression, poorer adjustment in dyadic relationships, and poorer monitoring and control of their children (Kazdin & Kolko, 1986). In another study, fire setters were more likely than non-fire-setting children to be exposed to a combination of harsh discipline and "less effective mild punishment for general misbehavior in the home" (Kolko & Kazdin, 1989, p. 173). In the study of pediatric detainees, 11% of the fire setters, but none of the other detainees, had been punished with fire (Ritvo et al., 1983).

Fire-Setting Treatment

In many jurisdictions, judges send pediatric fire setters to their local fire stations for educational intervention as their primary or sole treatment. Specially trained firefighters deliver information to the fire-setting child and family, and are responsible for determining which children have significant psychopathology and require mental health referral. This process has concerned mental health providers. Some seriously mentally ill children may be missed, as was reported in a retrospective review of 30 Child Behavior Checklists completed by the parents of juvenile fire setters. The checklists were scored after treatment referral, and only 41% of fire setters with pathological scores had been referred for mental health assessment (Pierce & Hardesty, 1997).

Some fire treatment programs have set up assessment protocols to determine the risk of future fire setting and evaluate psychopathology. The Burn Education Awareness Recognition and Support program (BEARS) in Chicago uses the Federal Emergency Management Agency (FEMA) Tool, which includes a standardized child interview, a family interview, and a child behavioral assessment form. Upon completion of the Tool, mental health referrals are made for the highest-risk group,

and fire safety education only is recommended for the curiosity/little-risk group (Bennett et al., 2004). Families may find firefighter referrals more acceptable and may resist mental health referrals (Webb et al., 1990).

For many children, brief educational interventions may be sufficient to stop fire-setting behaviors. Adler et al. (1994) studied the Australian Juvenile Fire Awareness and Intervention Program. A total of 138 child and adolescent recurrent fire setters (mean age 8.1 years, 97.1% male) were randomized to four treatment arms, which offered combinations of fire educational material, firefighter's intervention, and referral to a specialty clinic for fire setters. There was no significant difference between treatment groups. Children who received only an initial interview about fire setting and a safety pamphlet did just as well as children who received more intensive interventions. Due to these findings, the Intervention Program was modified so that more intensive behavioral interventions were offered only to older children who continued to set fires after initial fire safety training.

One-day multidisciplinary interventions have been designed for juvenile fire setters and have demonstrated efficacy in controlled and uncontrolled studies. In the Trauma Burn Outreach Prevention Program, 132 4- to 17-year-olds completed family visits to the burn unit, skin bank, and morgue and received fire safety equipment for home use (Franklin et al., 2002). Patients in the group had set serious fires, averaging more than \$4000 in property damage. One fire had resulted in the death of two of a fire setter's siblings. The treatment group was compared to a control group of fire setters who met criteria for the program but did not attend. Thirty-six percent of the untreated and 0.8% of the treated fire setters set further fires, according to review of fire department and court records at 8-month to 2.5-year follow-up.

Similarly, Colorado Juvenile Fire Offenders (JFO) has focused on a 1-day uncontrolled intervention (Carroll et al., 1986). A total of 220 children (as young as 4 years old) and adolescents completed the program, which consists of a half-day fire district training center intervention and a half-day burn center intervention. Parents were required to accompany their children to the program after it was determined that only 12% of families had provided fire prevention interventions at home following participation by the children only. Parental involvement increased reported home safety interventions to 65%. Overall program success was

assessed by monitoring referrals to social services following the intervention; none of the fire setters returned to social services in the first 3 years of the program.

Kolko (2001) investigated fire-setting outcomes in a controlled study that included more standardized mental health intervention. Two treatment arms were compared: 16 children who received home-visit treatment with a firefighter (HVF) versus 38 five- to 13-year-olds who attended one of two 8-week manualized interventions, either fire safety education (FSE) or cognitive-behavioral therapy (CBT). The HVF intervention was similar to that provided by the Australian program. In CBT, children practiced several skills, including self-control, problem solving, and conflict resolution. Their parents learned about fire-setting motivation, promoting prosocial activities, and providing consequences for fire setting. Families in the FSE intervention were trained in fire safety, evacuation, and reporting. The parents completed home safety education. At 1-year follow-up, all treatment groups had reduced fire setting and match play. However, families who had completed CBT reported significantly greater reductions in those dangerous behaviors. Children in the CBT group showed the greatest reduction in deviant fire behavior, while children receiving HVF showed an increase. The FSE intervention significantly reduced the number of children showing interest in fires. While HVF was not superior to the other interventions on any follow-up measure, it was inexpensive and adequate for many of the fire setters.

Intermittent Explosive Disorder

People with intermittent explosive disorder (IED) have abrupt aggressive outbursts that cause physical harm or property destruction. The aggression is grossly disproportionate to any provocation (DSM-IV-TR). Studies of IED, even in the adult population, are uncommon and suggest a mean age of onset of approximately 14 years (Kessler et al., 2006; McElroy, 1999). Studies focusing on the pediatric population are lacking. However, a structured interview, the Module for Intermittent Explosive Disorder, has been used to characterize explosive anger in a pilot study of 10- to 17-year-olds (Olvera et al., 2001). Youth meeting IED criteria differed from psychiatric controls, demonstrating significantly more weekly physically aggressive and lifetime aggressive episodes. The youth with IED scored higher on indices of ADHD and oppositional-defiant disorder but not conduct disorder;

the majority also screened positive for symptoms of mood disorders, especially depression.

Childhood-Onset Physical Aggression

Although the pediatric literature on IED is sparse, childhood-onset physical aggression has been subject to intense research scrutiny. Physical aggression is common in toddlers and preschoolers. Children demonstrate strategic use of physical force against peers by their first birthday (Baillargeon et al., 2007), with the most rapid onset of physical aggression seen between 11 and 15 months of age (Tremblay et al., 1999). Fifty-eight percent of preschoolers, both boys and girls, demonstrate modest physical aggression (Tremblay et al., 2004). However, a small group of children are markedly more aggressive than their peers. In this group, gender differences are clear by toddlerhood, with 5% of 17-month-old boys, but only 1% of same-age girls, demonstrating frequent physical aggression in a large birth cohort study (Baillargeon et al., 2007). When cohorts of children are followed into preadolescence, most of the older children demonstrate a pattern of decreasing physical aggression with age, especially girls, although a minority persists in stable use of physical aggression throughout childhood (Cote et al., 2006; Lee et al., 2007). This persistently aggressive minority has been followed into adulthood in several large-scale longitudinal studies. Men who were members of the most aggressive group in childhood demonstrate significantly more adult delinquency and lower educational and occupational achievement (Asendorpf et al., 2008). Childhood onset of aggression, as opposed to adolescent onset, may be a marker for persistence of serious aggression into adulthood. A New Zealand birth cohort study of 539 men found that those with conduct problems prior to adolescence were much more likely to be convicted of violent offenses by the age of 26 (Moffitt et al., 2002). While aggressive boys are more common and better studied, a recent longitudinal study focused on 881 girls. Physical aggression, as reported by teachers, declined between the ages of 6 and 12. However, at age 21, those women rated highly hyperactive and physically aggressive in childhood were significantly more likely to report that they continued to engage in physical aggression, became pregnant early, and required welfare assistance than their less aggressive and hyperactive peers (Fontaine et al., 2008). Another large-scale longitudinal study found that high parent ratings of aggression in 3-year-old girls strongly predicted continued aggression at age 12 (Pihlakoski et al., 2006).

Many risk factors contribute to childhood-onset physical aggression. In the Canadian National Longitudinal Study of Children and Youth, significant risk factors included male gender, low income, having a mother who did not complete high school, and hostile/ineffective parenting (Benzies et al., 2008; Cote et al., 2006). Other studies have identified risk factors such as birth weight exceeding 4500 grams, maternal prenatal smoking (Huijbregts et al., 2007), pregnancy and delivery complications, male gender, family antisocial behavior (Buschgens et al., 2009), neglect before the age of 2 (Kotch et al., 2008), and receptive vocabulary deficits (Seguin et al., 2009). The impact of media violence on childhood aggression is controversial; at most, media violence appears to increase the rate of aggression in children under the age of 10, but not in older children and teenagers (Ferguson et al., 2009; Manganello & Taylor, 2009; Paik & Comstock, 1994). Peer factors contributing to sustained physical aggression include early rejection by peers and association with other aggressive peers (Dodge et al., 2003; Van Lier et al., 2007).

Two temperament styles have been associated with persistent physical aggression. Children with persistently negative affects, who are unable to adapt and are irritable, struggle with early-onset aggression, particularly impulsive or reactive aggression. This style may be associated with impaired social informational processing, in which children “too readily impute bad intentions to others,” misreading the actions of others as hostile (Blader & Jensen, 2007; Lochman & Dodge, 1994). These children may also lack the ability to self-regulate, a skill that depends on the maturation of prefrontal–limbic connections and on modeling by flexible, supportive caregivers (Calkins & Keane, 2009). The other temperament style associated with persistent physical aggression is callous-unemotional. This style may be associated with proactive or instrumental aggression, which is calculated, covert, and not associated with anger dyscontrol. Children demonstrating prominent proactive aggression have been found to be more confident about aggressive acts and to have difficulty planning competent behavioral responses (Crick & Dodge, 1996).

Genetic studies of physical aggression are relatively new and await replication. Genes possibly associated with higher childhood-onset aggression include low-expressing variants of the serotonin transporter polymorphism (Beitchman et al., 2006), the serotonin 2A receptor Tyr 452 allele (Mik et al., 2007), and valine/valine homozygosity for the

catechol-*O*-methyltransferase (COMT) gene (Caspi et al., 2008; Monuteaux et al., 2009). The COMT gene modulates prefrontal cortex dopamine levels; valine carriers perform less well on measures of executive functioning (Tunbridge et al., 2006).

Recent medication treatment studies of childhood physical aggression have focused on children with developmental disabilities or ADHD. Stimulants have some efficacy for ADHD-associated aggression, although medications used for ADHD, including stimulants and atomoxetine, may also trigger aggression in less than 2% of patients (Connor et al., 2002; Polzer et al., 2007). A controlled study of valproic acid augmentation of stimulants demonstrated significant improvement versus placebo; prior to augmentation, 31 of 74 children had remitted on stimulant lead-in (Blader et al., 2009). A risperidone augmentation study of stimulants was also positive, although the placebo response rate was 77% (Armenteros et al., 2007). Risperidone as a single agent has demonstrated efficacy for aggression in children with below-average IQ and disruptive behavior disorders (LeBlanc et al., 2005) and in a multisite placebo-controlled study of children and adolescents with autism (Research Units on Pediatric Psychopharmacology Autism Network, 2002). Positive open-label studies have been published for quetiapine (Findling et al., 2006), aripiprazole, and ziprasidone (Bastiaens, 2009).

Psychosocial treatments for childhood-onset aggression have been delivered in a wide variety of formats, often including family, school, and individual therapy components. On meta-analysis, behavioral interventions demonstrated significantly larger effect sizes than family therapy; interventions were especially likely to be effective for younger children (Fossum et al., 2008). Among school programs, better-implemented programs, especially those targeting high-risk students, demonstrate higher efficacy (National Gambling Impact Study Commission, 1999).

Pathological Gambling

Pathological gamblers exhibit a preoccupation with gambling, need to use greater amounts of money to become adequately excited, and are unable to cut back or control their gambling. They may jeopardize relationships or employment, commit illegal acts, or borrow money to cover losses (American Psychiatric Association, 2000).

In many countries, access to legalized gambling was minimal before the 1970s, but it has expanded markedly in the last four decades. Many forms of

gambling are widely available, including casinos, scratch-off tickets, and national or state lotteries. In the United States, for instance, state lotteries were outlawed in the 1870s following a lottery scandal, but they reemerged in 1964 when New Hampshire established the first modern lottery. In the 1970s, the number of state lotteries expanded greatly (National Gambling Impact Study Commission, 1999; Olason et al., 2006; Wood & Griffiths, 2004). Gaming revenues have become important for balancing regional and national budgets, and advertisements may emphasize how gaming funds educational or infrastructure development (National Gambling Impact Study Commission, 1999; Volberg, 1994). Commonly, television programs announce the weekly lottery winners, and advertisements for gambling are widespread. Lottery tickets are sold in local grocery and convenience stores, often as an impulse item close to the candy display and the cash register (Moran, 1995). In the United Kingdom, as much as 90% of the adult population reports gambling at least once, and the majority play on a weekly basis (Camelot as cited in Wood & Griffiths, 1998).

Problem gambling is likely to manifest early, in adolescence. From 4% to 8% of adolescents meet criteria for pathological gambling, exceeding the rates reported in adult studies of 1%–3% (Deverensky & Gupta, 2000; Deverensky et al., 2003; Jacobs, 2000). Thus, very-early-onset gambling may be a particular risk factor for pathological gambling.

While gambling seems almost universally distributed, it is usually illegal for children to gamble. Despite this, children do gamble, often with the assistance and approval of their families (Wood & Griffiths, 1998, 2004). In a study of primary school students, 81% of 8- and 9-year-olds had already bet money, although a later study found that parents estimated that children's gambling did not begin until after the age of 11 (Ladouceur et al., 1994, 2001). Other studies of gambling in children and teenagers have reported an age of first gambling ranging from 7.95 to 11.2 years (Felsher et al., 2004; Westphal et al., 2000). Gupta and Derevensky (1997) reported that 81% of gambling 9- to 14-year-olds gambled while accompanied by family members.

Gambling in preteenagers appears quite common, and scratch-off tickets appear to be a common early form of gambling. In a 1996 Louisiana survey of 11,736 6th through 12th graders, scratch-off tickets were the most frequent form of weekly gambling (Westphal et al., 2000). A Canadian survey of 1072 6th through 12th graders reported results by grade level (Felsher et al., 2004). Most of the children in

the study, sixth and seventh graders, mean age 11.2, were unaware of the legal age for lottery ticket buying. However, 53.8% of them reported being at least occasional participants in scratch-off ticket gambling, the most popular form of gambling chosen. Scratch-off tickets were also the earliest form of gambling among this group of youngsters, who reported first playing at a mean of 7.95 years and first purchasing tickets at a mean of 9.03 years. Many did not perceive scratch-off tickets as a form of gambling; 55.3% reported that it was easy for them to buy tickets.

Studies of adult problem gamblers suggest that early onset of gambling increases the risk of later pathological gambling (Burge et al., 2006). For instance, in an American survey study, 23%–36% of adult problem and pathological gamblers reported they had started gambling before the age of 15, versus only 7%–8% of all gamblers (Volberg, 1994). A prospective study of youth gambling found that early onset of gambling (by sixth grade, or approximately 11 years of age) was a significant risk factor for problem gambling in young adulthood (Winters et al., 2002).

Impulsivity, measured by self-reports and by a history of childhood ADHD, is increased in adult pathological gamblers (Rodriguez-Jiminiz et al., 2006). Prospective studies of children have also demonstrated links between impulsivity and onset of gambling. A longitudinal study of 903 Canadian boys explored the relationship between the age of gambling onset, impulsivity, inhibition, and the risk of problem gambling (Vitaro et al., 2004). Gambling data were collected from ages 11 to 17. Most of the boys (61.7%) followed a trajectory of low gambling involvement. Two high-risk groups were also identified. The chronic high-gambling group, 22.1% of the sample, included boys who were likely to gamble by the age of 11 and remained highly likely to gamble throughout the study period. By the age of 17, more than 20% of the chronic high-gambling group fit the profile of high-risk or problem gamblers. These boys described themselves on Eysenck Impulsiveness and Venturesomeness self-rating scales as more impulsive than the other groups. They were rated by their teachers as less inhibited at ages 6 and 10. A third group did not start gambling before age 13 but rapidly increased the gambling behavior once initiated; 15% met criteria for problem or high-risk gambling at age 17. Boys in this late-onset gambling group rated themselves as intermediate in impulsiveness, and their teachers rated them as more inhibited than the chronic high-gambling group. Overall, this

study suggests that impulsivity and lack of inhibition, even as measured in childhood, may predict a higher risk for problem gambling later in life. Similarly, in another longitudinal study of children in Baltimore, parents reported high levels of impulsivity and hyperactivity in first graders who became gamblers by age 17 (Martins et al., 2008).

Peer behavior may significantly impact gambling behavior, especially in girls. A computer-simulated roulette game was used to study individual and group gambling behavior in 130 fourth through sixth graders (Hardoon & Devereaux, 2001). Boys bet more money consistently, slightly increasing their wagers throughout the trials. Girls increased their wagers in group settings. It appeared that children tried to impress each other in group settings by betting more.

While gambling behavior appears common in children, pathological gambling is infrequent before adolescence, so treatment studies of children have not been reported. Rather, treatment models for children have focused on prevention. Children may be particularly appropriate candidates for primary prevention methods, which are aimed at preventing the onset of risky gambling. Proposed objectives for primary prevention of gambling include increasing knowledge in youth, parents, and the general public about the risks and consequences of gambling. Goals would include changing media depictions of gambling and modeling by parents and peers. Other methods could include limiting availability and visibility of gambling materials to youngsters in retail stores and enforcing age restrictions on gambling (Messerlian et al., 2005).

Kleptomania

People with kleptomania do not resist their recurrent impulses to steal; they are motivated more by a desire to take or have an item than to sell or use it (American Psychiatric Association, 2000). Kleptomania is not well characterized in childhood. Adults with kleptomania typically report onset of shoplifting at around the age of 16 years (Feeney & Klykylo, 1997; Grant & Kim, 2002). One case report has detailed the treatment of an 11-year-old with ADHD and kleptomania. The combination of sertraline and methylphenidate was successful in stopping her recurrent stealing (Feeney & Klykylo, 1997).

Childhood-Onset Theft

Childhood theft is slightly better studied than childhood kleptomania, but prevalence data are lacking

for both. Developmental studies have demonstrated that children have a different moral response to theft than adults. Small children expect that thieves will feel happy after successful completion of dishonest acts, even though other studies find that adults would not predict this expectation in children (Barden et al., 1980; Zelko et al., 1986). Four-year-olds linked positive emotions to material gains from theft in one study, while 8-year-olds believed that thieves would have less positive emotions due to growing understanding of the inherent harm and unfairness associated with theft (Arsenio & Kramer, 1992).

Theft is a covert antisocial behavior (Loeber & Schmalin, 1985) often seen in conjunction with other covert behavior problems such as lying, defiance, and wandering off without permission. Serious acts of theft are more common in youth with early-onset behavior problems (Taylor et al., 2001). Early theft is linked to ultimate diagnosis of disruptive behavior disorders and earlier commission of armed robbery (Gaber et al., 1987; Lahey et al., 1999). A follow-up study of children referred for behavior problems found that theft, more than aggression, significantly predicted juvenile court involvement at 2- to 9-year follow-up. Fifty-six percent of children with at least four parent-reported episodes of theft (at a mean age of 9.8 years) versus 13% of aggressive peers without a theft history had juvenile court records at follow-up (Moore et al., 1979). A juvenile detention facility study found that theft was the most frequently reported offense among young detainees. Young people arrested for theft were more likely than those arrested for other crimes to be arrested before the age of 12, to have multiple charges, and to be charged later with other offenses, including assault (Taylor et al. 2001). Despite the concern that theft may be a *gateway crime*, treatment and prevention research for juvenile theft is minimal; it remains unclear what constitutes normative versus pathological theft behavior in childhood (Taylor et al., 2001).

Pathological Grooming: Trichotillomania and Pathological Skin Picking

Trichotillomania

People with trichotillomania (TTM) repeatedly pull out their hair, causing visible hair loss. They experience rising tension prior to pulling, followed by “pleasure, gratification, or relief” after pulling (American Psychiatric Association, 2000). However, in multiple pediatric case series, 20.6%–90% of children with TTM denied feeling rising tension

followed by relief. The highest denial rate was reported in the youngest series, mean age, 9.9 years (Hanna, 1997; King et al., 1995; Reeve et al., 1992; Tolin et al., 2007). Interestingly, three boys who developed secondary TTM following stimulant treatment all endorsed tension and relief (Martin et al., 1998).

DIAGNOSTIC FEATURES: PULLING SITES AND BIOPSY FINDINGS

Children with TTM most commonly pull scalp hair, typically in a diffuse pattern. Hair loss may be more severe on the side of the dominant hand (Malhotra et al., 2008). Some children may demonstrate the *Friar Tuck sign* from pulling primarily at the crown (Tay et al., 2004). Generally, eyebrows and eyelashes are reported to be the second most common sites of pulling, and 26%–54% of children report pulling from multiple sites (Hanna, 1997; Reeve et al., 1992; Santhanam et al., 2008; Tolin et al., 2007).

Occasionally, punch biopsy is necessary to diagnose TTM. Some children are very secretive, pull in private, especially at night, and deny pulling as the cause of hair loss. In case series of children and adolescents with hair pulling, 40%–53% initially denied this behavior (King et al., 1995; Santhanam et al., 2008). Parents may find the diagnosis difficult to believe (Stroud, 1983), especially when multiple family members or pets are also missing hair. One 7-year-old boy presented with focal hair loss, which was also demonstrated by two cats and a dog that liked to sleep with him. Biopsy of the little boy and one of the cats established that the hair loss was from pulling, not a shared fungal infection (Zone et al., 2003). Another 7-year-old was reported to pull and eat her own hair and that of her dog (Weller et al., 1989). Some children with TTM may pull hair from other children, and very young children may pull it from their parents (Kao et al., 2005; Oranje et al., 1986).

On examination, areas of hair loss (alopecia) from TTM may resemble alopecia areata, androgenic alopecia, traction alopecia (i.e., from tight hair elastics), or tinea capitis (Adams & Kashani, 1990; Bruce et al., 2005). In TTM, hair may be twisted before it is pulled, leaving hair of assorted lengths distributed over the bald spot, which is typically oval or linear (Stroud, 1983). On biopsy, normal hairs are seen growing “among empty hair follicles in a non-inflammatory dermis” (Bruce et al., 2005, p. 367). Trichomalacia and pigment casts have been described as major diagnostic features of scalp biopsy

in TTM (Bergfeld et al., 2001). The scalp may appear brown from rubbing (Stroud, 1983). Biopsy can establish that hair is being pulled, but not by whom, as demonstrated in one case in which a tutor was eventually demonstrated on surveillance video to be pulling hair from three young students who apparently had been afraid to report the abuse (Sarawasad, 2005).

EPIDEMIOLOGY

Trichotillomania has been described in the dermatological literature as being seven times more common in children than adults (Mehregan, 1970); however, data supporting that assertion are lacking. A large survey study of college students found a 0.6% lifetime prevalence of TTM and a 1.5% (male)/3.4% (female) lifetime prevalence of hair pulling causing visible hair loss (Christenson et al., 1991b). Mean age of onset of hair pulling in a series of 60 adults was 13 ± 8 years (Christenson et al., 1991a; approximately 9% reported that they had been pulling since they were 5 years of age or younger, and approximately 62% reported the onset of pulling by the age of 20 years. In three large case series in mental health clinics, less than 1% of pediatric patients presented with hair pulling (Fung & Chen, 1999; Mannino & Delgado, 1969; Ranga Rama Krishnan et al., 1985). Muller (1987) reported on a series of 145 patients with TTM seen over a 10-year period, ranging at age of presentation from 2 to more than 60 years of age. Thirty percent of these patients were children under the age of 10 years. In that series, the peak age of presentation was between 11 and 17 years; the age of onset was not reported. In Hanna's series of 11 children with TTM, age of onset ranged from 2 to 13.5 years (Hanna, 1997).

Overall, it appears likely that trichotillomania is not common in any age group, but may be more commonly seen in patients under, rather than over, the age of 18 years. Adolescent versus pediatric predominance has not been established.

A benign, self-limited variant of TTM has long been reported in children under the age of 6. However, long-term studies have not confirmed that very-early-onset TTM resolves spontaneously. Clear gender predominance has not been established in this young population, with some studies citing male and others female (Wright & Holmes, 2003) predominance. In Muller's population of patients with TTM, males predominated only in the 2- to 6-year-old age group. Muller noted, “in small children [TTM] is usually a minor problem and clears up spontaneously or with minor encouragement

and explanation by the primary physician" (Muller, 1987, p. 597). Wright and Holmes reported that "most" of ten toddlers treated with behavioral and family interventions to reduce stress had reduced or stopped hair pulling at 3-month follow-up.

COMORBIDITY

Comorbidity with other psychiatric disorders has been investigated in small case series of children with TTM; many of these series include adolescents. The majority of children with TTM appear to have psychiatric comorbidity, especially anxiety, mood, or habit disorders. Those studies assessing habit disorders report comorbid habits such as nail biting, thumb sucking, or skin picking in 10%–50% of children with TTM (Hanna, 1997; Malhotra et al., 2008; Oranje et al., 1986; Reeve et al., 1992). While TTM has been conceptualized by some researchers as an obsessive-compulsive spectrum disorder, obsessive-compulsive disorder (OCD) has been found to be comorbid with TTM in only a small minority of pediatric patients, ranging from 4.8% to 13.3%. Nor is OCD seen in the majority of their parents (King et al., 1995; Oranje et al., 1986; Tolin et al., 2007). Chronic tic disorders also appear uncommon in children with TTM, with no series demonstrating comorbid Tourette's disorder, and chronic tic disorders have been reported in only 0%–13.3%. Much more common are non-OCD anxiety disorders, particularly overanxious disorder (which has been subsumed into the diagnosis of generalized anxiety disorder in the DSM-IV-TR), in 20%–60%, and depressive disorders (especially dysthymia), in 8.7%–36% (Hanna, 1997; King et al., 1995; Reeve et al., 1992; Tolin et al., 2007). Significant comorbid anxiety was reported in 50% of a series of toddlers with TTM (Wright & Holmes, 2003). Comorbid mental retardation was reported in only one study, in 19% of patients (Oranje et al., 1986).

TRICHOBEZOARS

Some children with TTM engage in *trichophagy*, chewing and swallowing pulled hair. Most case series have not investigated the frequency of this behavior in children; one series found that 20% of children and adolescents reported it (King et al., 1995). Trichophagy can trigger the development of trichobezoars, large mats of swallowed hair combined with food particles and even fibers from carpeting or fabric. These hairballs can obstruct the stomach and extend into the intestine. Children as young as 2½ years of age have required surgical

removal of bezoars (Aleksandrowicz & Mares, 1978; McGehee & Buchanan, 1980). Children with trichobezoars are often chronic hair pullers, who may or may not have apparent hair loss at presentation with the trichobezoar. Symptoms of pediatric trichophagy include failure to gain weight, a painless abdominal mass, flatulence, halitosis, constipation, and nausea (De Backer et al., 1999; Phillips et al., 1998; Ramadan et al., 2003). Iron deficiency anemia has been reported in toddlers with trichobezoars, triggering speculation that TTM in this age group may resemble iron deficiency–triggered pica (McGehee & Buchanan, 1980).

TREATMENT AND OUTCOME

Many children with TTM do not admit to hair pulling. They may be oddly oblivious of their hair loss; as King et al. (1995) comment, their parents' concern "stood in marked contrast to the child's stated indifference" (p. 1454). These authors noted that "patients' own degree of distress, however, varied both over time and across subjects and was sometimes at variance with the observed degree of cosmetic impairment" (p. 1454) even in the presence of near-total baldness. While this denial may seem an insurmountable obstacle to engagement in psychotherapy, many pediatric treatment studies describe children who insisted that they were not pulling their hair but who completed therapy regardless.

HYPNOTHERAPY

Hypnotherapy has been described as a treatment modality for at least seven children, ranging from ages 3 to 12 years at the time of treatment (Cohen et al., 1999; Kohen, 1996). When possible, therapists started treatment by teaching the children to monitor their own hair pulling in order to increase autonomy in dealing with their symptoms. Older children were then taught relaxation/mental imagery and self-hypnosis. The hypnotherapist provided direct suggestions for one hand to "help" the other to stop pulling. The technique was adjusted to fit each child's age and interests. For instance, preschoolers were not expected to close their eyes for hypnosis, and the therapist used more playful language, teaching the child to use the nonpulling hand as the "friend" of the pulling hand. All of the pediatric patients were reported to stop hair pulling with the treatment, although one patient required later treatment for a brief relapse. Cohen et al. (1999) noted that this treatment method requires responsible parents and highly motivated patients.

PSYCHODYNAMIC FAMILY THERAPY

Brief hospital-based psychodynamic interpretation was used to treat a 27-month-old girl who had required surgical removal of a trichobezoar (Aleksandrowicz & Mares, 1978). The little girl was too fearful and tense to tolerate hypnotherapy, but she responded well to brief family interventions during her recovery from surgery. She demonstrated significant improvement at 6-month follow-up, although the extent of hair regrowth and subsequent pulling was not specified.

HABIT REVERSAL THERAPY AND BEHAVIORAL THERAPIES

Brief behavioral interventions have been successful for toddlers and preschoolers with TTM. Often, these interventions are paired with *time in*, or increased parental attention at nonpulling times. One strategy targeted thumb sucking in young children who suck their thumbs while pulling their hair, as thumb sucking is easier to extinguish than hair pulling. Applying a bitter substance to the thumb was reported to dramatically reduce thumb sucking and associated hair pulling in four children ages 2 to 5 years (Altman et al., 1982; Friman & Hove, 1987; Knell & Moore, 1988). Another family tried three interventions with a thumb-sucking, hair-pulling 5-year-old: a bitter substance, a thumb alarm (similar to a bedwetting alarm), and a leather thumb post. The thumb post proved the most successful and easiest intervention, stopping hair pulling and thumb sucking at day 14 (Watson & Allen, 1993).

Other behavioral interventions have been used for children with TTM who lack comorbid thumb sucking. For younger children, parents have placed socks on their children's hands at night and also when pulling was observed. This method demonstrated efficacy in an ABAB case study of a 3-year-old (Blum et al., 1993). A 27-month-old required double socks early in treatment; she was gradually weaned to single socks, then to socks of decreasing thickness. Hair pulling had resolved when the child was reassessed as a 4-year-old (Byrd et al., 2002).

School-age children have most commonly been treated with behavioral therapies, sometimes in combination with pharmacotherapy. In a review of 10 cases in which behavioral therapy alone was used to treat school-age children with TTM, 90% were reported to be successful (Bruce et al., 2005). Behavioral interventions used have included self-monitoring, token economy, response cost, facial screening (typically for children with mental retardation), and habit reversal therapy. In this age group,

habit reversal therapy may be simplified. A 9-year-old girl responded positively to a combination of increased physical nurturing by her mother and her teacher and simple response prevention. She would sit on her hands or hold a pencil with both hands if she was seen touching or pulling her hair. She had a full head of hair at 1-year follow-up (Blum et al., 1993).

Three children, ages 10 to 12½ years, completed a more intensive habit reversal regime (Vitulano et al., 1992). Over six sessions, the children learned self-monitoring, collecting pulled hair each day in labeled envelopes and logging hair-pulling episodes as well as urges to pull. In habit interruption and prevention training, they were taught to extend their arms down with fists clenched for 90 seconds in response to pulling or pulling urges, and also practiced the technique twice daily regardless of whether they had the urge to pull. They also brushed their hair daily as a form of overcorrection. Following the example of Azrin et al. (1980), the children recorded their reasons to stop pulling in an annoyance review (Moore et al., 1979). The children developed self-messages, such as "I want pretty long hair to brush," which they used frequently. Parents were instructed to give praise and tangible rewards for efforts to follow the treatment plan. The outcome was rated via several instruments, including self-reports and clinician-rated impairment and improvement scales, as well as photographic records of hair growth, which were rated blindly.

The children disliked collecting their hair in envelopes, and conflict with parents regarding pulling and monitoring by the children was problematic in all three cases. One child demonstrated improvement following an interlude of family therapy to improve parent-child interaction. By the end of the study, two of the children had demonstrated reductions in pulling and improved hair growth on photographs, while a third child, with significant depression, continued to pull, despite the use of clomipramine in addition to behavioral therapy.

MEDICATION TRIALS

Medication trials for TTM are few in the pediatric population, with most reports focusing on SSRIs. Treatment for children with TTM using SSRIs has been described in individual case reports and one retrospective review. In the review, which involved 20 patients, the age of clinical presentation ranged from 2 to 14 years (Malhotra et al., 2008). Fourteen of the children were treated with a variety of medications; nine children also received behavior

therapy. Half of the medicated children took fluoxetine, 10–20 mg daily, with others taking sertraline or the nonselective SRI clomipramine. The authors reported a 50% dropout rate; 80% of those completing treatment were rated as improved. Results for individual medication trials were not reported, and it was unclear if any medication was more effective than the others.

Fluoxetine treatment of four individual children has been reported, with the two who responded improving on doses of 10 mg daily (Palmer et al., 1999; Sheikha et al., 1993; Vitulano et al., 1992; Wilens et al., 1992). One of two children treated for depression and TTM responded to imipramine (Sheikha et al., 1993; Weller et al., 1989). A pair of 12-year-olds who were not responsive to fluoxetine were later treated with clomipramine; one child did not respond on 150 mg daily, while the other was reported to be doing well at 6-month follow-up on 250 mg daily (Vitulano et al., 1992; Wilens et al., 1992).

While neuroleptics, especially as augmentation agents, have been reported in several series and trials in adolescents and adults with TTM, only one child has been reported to have been treated with neuroleptics. This 11-year-old with severe mental retardation, autism, and TTM did not obtain relief on thioridazine but responded well to haloperidol 1 mg BID, relapsing on 1.5 mg daily and returning to remission of hair pulling on return to 1 mg BID (Ghazziudin et al., 1991).

Naltrexone, an opioid antagonist, has been investigated in TTM. People with TTM continue hair pulling despite the self-inflicted pain, suggesting that the pain response as mediated by the opioid system may be impaired. An open pilot study investigated naltrexone treatment in 14 children (mean age 9 years) with TTM (De Sousa, 2008). Patients reached a mean final dose of 66.07 mg daily in the 10-month study. Adverse effects were denied by the patients, and liver function test results were unchanged throughout the study. Of these children, 21.4% reported no hair pulling at the end of the study; 57% reported improvement.

Pathological Skin Picking

Pathological skin picking (PSP) is classified as an impulse control disorder not otherwise specified in the DSM-IV-TR. People with PSP engage in ritualistic or impulsive skin picking, sometimes spending hours a day on the habit (Odlaug & Grant, 2008; Wilhelm et al., 1999). Mean age of onset has been reported to range from 12 to 16 years (Flessner &

Woods, 2006; Grant & Christenson, 2007; Keuthen et al., 2001; Odlaug & Grant, 2008; Simeon et al., 1997; Wilhelm et al., 1999).

Odlaug and Grant (2007) compared adults with childhood-onset PSP to patients with later onset. In this study of 40 patients, 47.5% reported onset of picking before the age of 10 years. Childhood-onset patients were more likely to report subconscious picking, and reported a mean age of onset of 5.6 years. Symptom severity was similar in early- and late-onset patients.

Patients with the neurodevelopmental disorder Prader-Willi syndrome (PWS) appear particularly vulnerable to developing PSP in childhood, even when compared to mentally retarded controls (Akefeldt & Gillberg, 1999; Kim et al., 2005). In a Japanese questionnaire study, 35.3% of 2- to 5-year-olds and 56.1% of 6- to 11-year-olds with PWS were reported to exhibit excessive skin picking (Hiraiwa et al., 2007).

Treatment of pediatric PSP has rarely been reported in the research literature. A 9-year-old boy with PWS and severe skin picking causing deep wounds was treated with fluoxetine to a maximum dose of 60 mg daily without change in skin picking. Clomipramine augmentation exacerbated his overeating. When the child was hospitalized due to severe skin picking, naltrexone 50 mg daily was added to fluoxetine in an ABA model; each trial of the naltrexone-fluoxetine combination was associated with a significant decrease in skin picking within 7–10 days of treatment (Benjamin & Buot-Smith, 1993).

Behavioral therapy was the primary intervention used to treat a 9-year-old with borderline intellectual functioning, ADHD, and PSP (Lane et al., 2006). The little boy would pick and scratch at his skin in school. At baseline, he was observed to pick his skin during the majority of his school hours. He was given a box of three soft balls to handle during high-risk times. His skin picking was found to decrease from 67% of the time to 22% when he was taking his stimulant medication and using the soft balls to keep his hands occupied; skin picking increased on the days when the stimulant was not administered. Long-term follow-up was not possible.

Conclusion

Current data on childhood ICDs are incomplete, but suggest that at least a substantial minority of adults develop ICD symptoms or even full-blown ICDs as children. Some criteria for ICDs in the DSM-IV-TR appear less likely to be endorsed by children, such as rising tension and relief, while other exclusionary

criteria, such as the exclusion of comorbid conduct disorder in pyromania, do not reflect common presentations of highly symptomatic children. Pyromania/fire setting and TTM are the best-characterized childhood ICDs; however, large-scale epidemiological and treatment studies are lacking for all ICDs in this age group. Likewise, reproducible rating instruments appropriate for assessing children are not widely used in childhood ICDs, making objective assessment of treatment outcomes problematic.

Future Directions: Questions for Future Research

1. Does onset of TTM before the age of 6 years truly predict a benign, self-resolving course? Are there genetic and/or other biomarkers predictive of the outcome for TTM?

2. Can an objective rating instrument be developed for assessment of the recurrent risk of fire setting in children? Ideally, such an instrument should be accessible to non-mental-health assessors in the juvenile justice system.

3. Can effective public policy regarding gaming advertising and availability reduce the marked recent increase in gambling among children and adolescents?

4. Can behavioral techniques, including modified habit reversal therapy, be applied successfully to children with PSP?

5. Are there distinct syndromes of kleptomania and IED in children?

6. Can childhood ICDs be treated successfully with medications that have helped adolescents and adults, such as SSRIs, opioid antagonists, or mood stabilizers? Is neuroleptic augmentation reasonable and safe in this population?

7. Hormone therapy (testosterone) may help reduce fire setting in patients with Klinefelter syndrome. Will hormone therapy (typically human growth hormone) used to treat patients with PWS help skin picking?

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