

INHALANT ABUSE

And What To Do About It



What Is Inhalant Abuse?

- 📄 **Deliberate inhalation of fumes, vapors or gases to “get high”**
- 📄 **“Sniffing,” “Huffing,” or “Dusting”**
- 📄 **More than 1,400 household products**
- 📄 **High of choice for 6-12 year olds**
- 📄 **26% (1 in 4) children in 6th grade have used inhalants**
- 📄 **Fourth most abused substances after cigarettes, alcohol, and marijuana**
- 📄 **Can lead to later abuse of illegal drugs**

Substances Inhaled...



HOUSEHOLD *HIGHS*



Substances Inhaled...

Inhalants



Commonly Abused Products

Gases

- Nitrous oxide, helium, refrigerants, propane, amyl nitrate (poppers)

Cleaning Agents

- Spot remover, degreaser

Solvents and Fuels

- Butane propane, nail polish remover, paint thinner/remover, correction fluid, permanent markers, gasoline, engine octane boosters

Commonly Abused Products, cont.

Aerosols

- Spray paint, hair spray, air freshener, deodorant, fabric protector, computer keyboard cleaners

Adhesives

- Model airplane glue, rubber cement, PVC cement

Foods

- Cooking spray, aerosol whipped cream toppings

Street Terms for Inhalants

Amys

Bang

Bolt

Boppers

Bullet

Climax

Glading

Gluey

Hardware

Head cleaner

Hippie crack

Kick

Locker room

Poor man's pot

Poppers

Rush

Snappers

Toncho (octane booster)

Source: Office of National Drug Control Policy (ONDCP), *Drug Policy Information Clearinghouse Fact Sheet--Inhalants*, June 2001.

Examples of Abusable Products

Kitchen

- Whipped cream
- Whippets (Nitrous oxide cartridges)
- Cooking spray
- Insecticides
- Spray (aerosol) cleaners

Basement or workshop

- Spray lubricants
- Fabric protector
- Paint, cans or spray (especially gold or silver spray paint)
- Paint and Lacquer thinner
- Toluene, mineral spirits
- Paint remover, stripper
- Contact cement

School and art supplies

- Computer gas duster
- Correction fluid & thinner
- Permanent magic markers
- Dry erase markers
- Contact and rubber cement
- Airplane or model glue
- Spray adhesive

Bathroom

- Hair spray
- Air freshener
- Nail polish and remover
- Spray deodorant
- Spray cleaners

Anesthetics

- Nitrous oxide
 - Balloons & tanks
 - "whippets" (mini-tanks)
 - whipped cream
- Ether
- Chloroform

Garage

- Stove fuel
- Propane (from barbeque grills, portable torches)
- Gasoline
- Carburetor cleaner
- Charcoal starter fluid
- Car starter fluid
- Flat tire repair aerosol cans

Miscellaneous

- Any spray (aerosol) cans
- Mothballs
- Freon from air conditioners, refrigerators
- Halon (from fire extinguisher)
- Gas cigarette lighters
- Gas cigarette lighter refills (butane)
- Lighter fluid
- Dry cleaning fluid and spot removers

Nitrites

- Amyl nitrite
- Butyl nitrite

How It's Done.....

Mechanisms of Abuse

Sniffing from a container, bag, cans, clothing:

- "Bagging" - paper or plastic bag containing inhalant held to nose, head or over head

Inhaling from a chemical-soaked rag, open container or balloon:


- "Huffing" - Solvent applied onto nasal mucosa or nearby surface (shirt collar); Using familiar innocuous containers to conceal product and inhaling fumes out of soft drink can or nitrous-oxide-filled balloons

Aerosol sprayed directly into mouth or nose:

- "Dusting" - canister straw placed into nose or mouth

How It's Done.....

Mechanisms of Abuse, cont.

 **Fast onset of “high”**

 **Different products operate differently on the body**

- Some stimulate dopamine release
- Some dilate blood vessels
- Some stimulate the GABA receptors and inhibit NMDA receptors, slowing CNS
- Some contribute to toxic fumes replacing oxygen in the lungs (asphyxia)

Inhalation Abuse




What is the high like?

 Capable of producing a quick generally pleasurable sensory experience

 Rapid dissipation

 Minimal “hangover” symptoms

 Widely available, convenient, cheap, easily concealed, legal for specific uses

Epidemiology of Inhalant Abuse

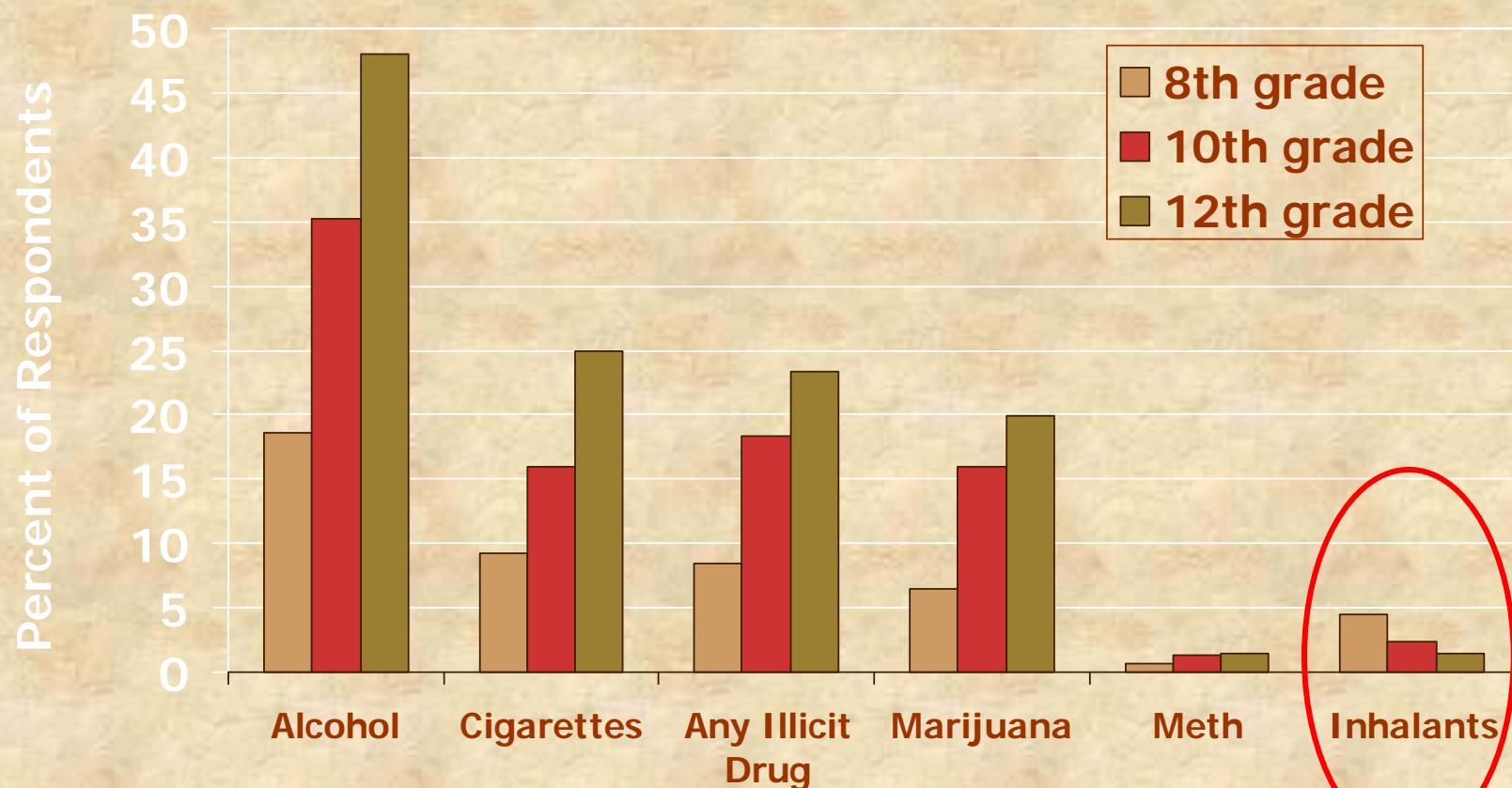
Peak age is 14-15 y/o

- Onset young as 5-6
- Use declines by 17-19
- Use continued into adulthood
 - Work related hazard
 - Men having sex with men

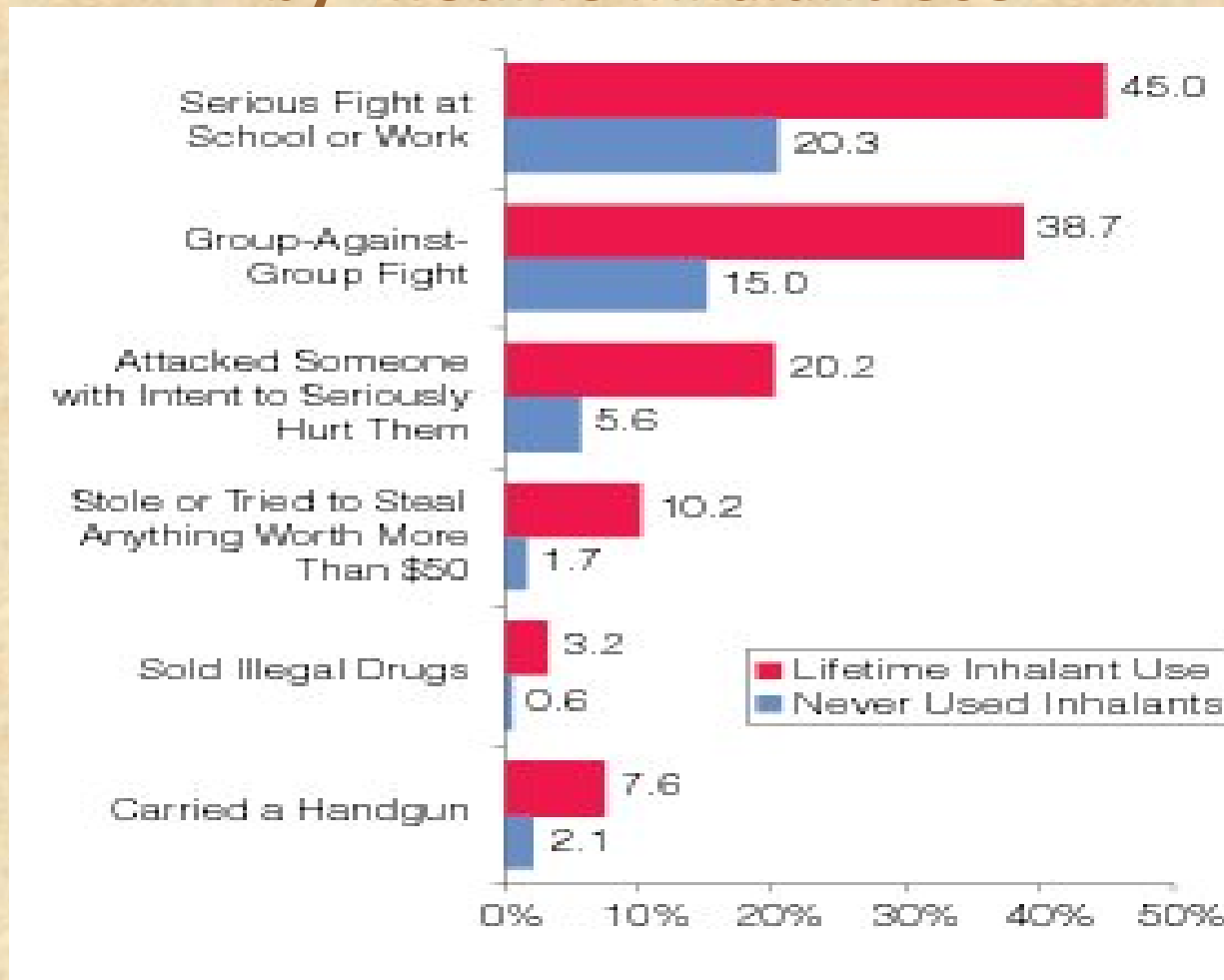
Annual survey of drug use in US

- 72.3% of Inhalant abusers were younger than 18 (16 = mean)
- No significant changes since 2002
- Prevalence of lifetime inhalant use (“ever used”) among 12th graders has ranged from 10.3% (1976) to 18% (1990).
- 2006 rate 11.1%
- According to recent NIDA data, fewer 8th and 10th graders view inhalant use as dangerous, potentially leading to an upswing in use.

Past Month Drug Use Rates



Percentages of Youths Aged 12 or 13 Who Participated in Delinquent Behaviors, by Lifetime Inhalant Use



Data from the NSDUH

- Male and female adolescent rates similar.
- Rural use is highest. Native Americans have the highest rates followed by Whites and Hispanics. Blacks have very low rates.
- About 35% of youths aged 12 or 13 who used inhalants in their lifetime also used another illicit drug compared with 7.5% of youths aged 12 or 13 who had never used inhalants in their lifetime.
- Adolescents with a history of foster care were 5x more likely to become inhalant dependent than those never placed away from home.
- Adolescents who were treated for mental health problems in the past year were 4x more likely to be dependent on inhalants than those who received no service.

Short and Long Term Effects

Signs & Symptoms

Short Term Effects

 Headache


 Muscle weakness

 Abdominal pain

 Severe mood swings

 Violent behavior

 Slurred speech

 Numbness and tingling
in hands and feet

 Fatigue

 Lack of coordination

 Apathy

 Impaired judgment

 Dizziness

 Loss on consciousness


Signs & Symptoms

Long Term Effects


 Short-term memory loss


 Emotional instability

 Cognitive impairment

 Slurred & “scanning”
speech

 Tremor

 Loss of sense of smell

 Diffuse cerebral,
cerebellar, & brainstem
atrophy

 Optic neuropathy

 Weight loss


 Muscle weakness

 Staggering or stumbling

 Wide-based ataxic gait

 Irritability

 Depression

 Hearing loss

Additional Damage Caused By Inhalants

- 📄 Chronic inhalation of nitrous oxide (whipped cream propellant) and hexane (found in some glues and camp stove fuels) results in damage to the peripheral nerves. Symptoms can include numbness, a tingling sensation or total paralysis.
- 📄 Toluene destroys cells that relay sound to the brain. Chronic abusers can become deaf.

Additional Damage Caused By Inhalants, cont.

- 📄 Repeated use of spray paint as an inhalant can cause lung damage.
- 📄 Some substances like nitrites and methylene chloride (paint thinner) chemically block the oxygen carrying capacity of the blood.
- 📄 Toluene appears to affect the optic nerve causing sight disorders.
- 📄 Inhalant damage to the cerebellum results in loss of coordination & slurred speech.

Additional Damage Caused By Inhalants, cont.

- 📄 “Sudden sniffing death syndrome” is due to a sudden, unexpected disturbance of the heart’s rhythm. **ALL inhalants can produce sudden death syndrome.**
- 📄 Cellular death in the brain causes permanent personality changes, memory impairment, hallucinations & learning disabilities.
- 📄 Chronic abusers experience tremors and uncontrollable shaking.
- 📄 Chronic abuse also leads to muscle wasting.

Causes of Death from Inhalant Abuse

Acute:

- Direct Causes: immediate or postponed “Sudden Sniffing Death Syndrome.”
- Indirect Causes: suffocation, aspiration, trauma, drowning, fire, other

Sudden Sniffing Death Syndrome

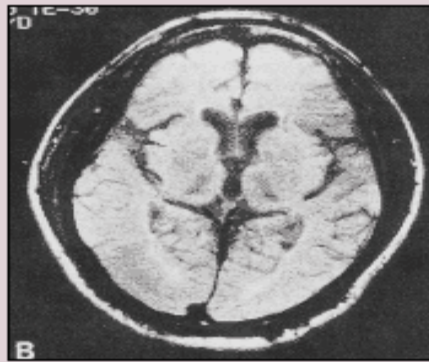
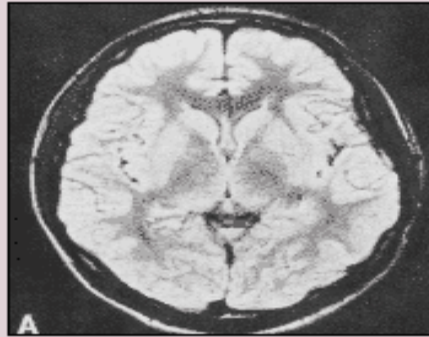
- 📄 **Not dose dependent**
- 📄 **Ramsey et al. (1989) noted it in 22% of inhalant abusers**
- 📄 **Leading cause of death among inhalant abusers**
- 📄 **Mechanism of Sudden Sniffing Death:**
 - Hydrocarbons and other inhalants sensitize the myocardium to epinephrine
 - Stressor causing increased epinephrine causes fatal arrhythmia

Causes of Death from Inhalant Abuse

Delayed

- Cardiomyopathy
- Central nervous system toxicity: toluene dementia and brainstem dysfunction
- Hematologic: aplastic anemia, leukemia
- Hepatocellular carcinoma
- Renal toxicity: nephritis, nephrosis, tubular necrosis

This is your brain...on Inhalants



Courtesy of Neil Rosenberg, M.D.

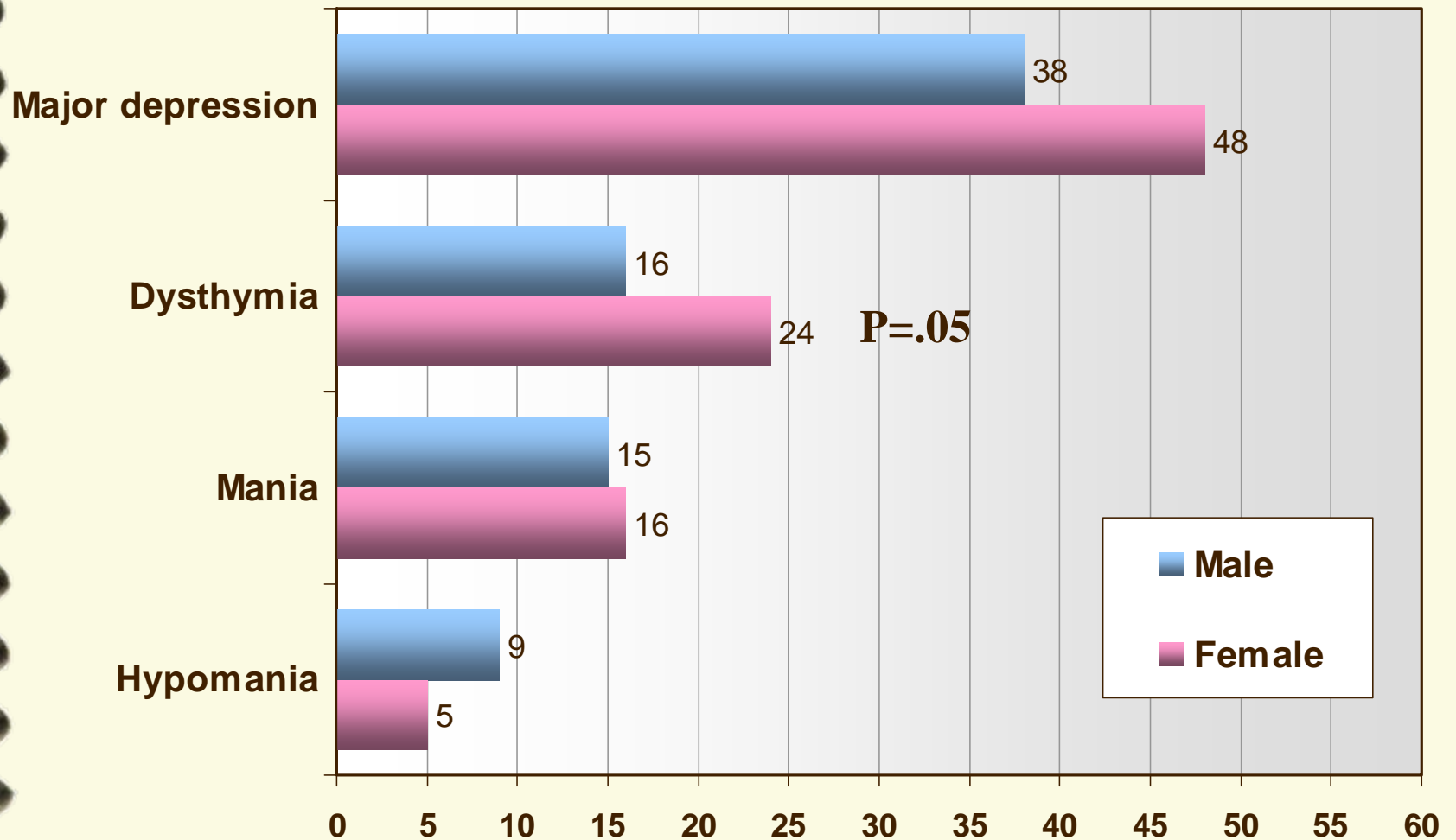
Brain images show marked atrophy (shrinkage) of brain tissue in a toluene abuser (B) compared to a nonabusing individual (A). Note the smaller size and the larger empty (dark) space within the toluene abuser's brain. (The white outer circle in each image is the skull.)



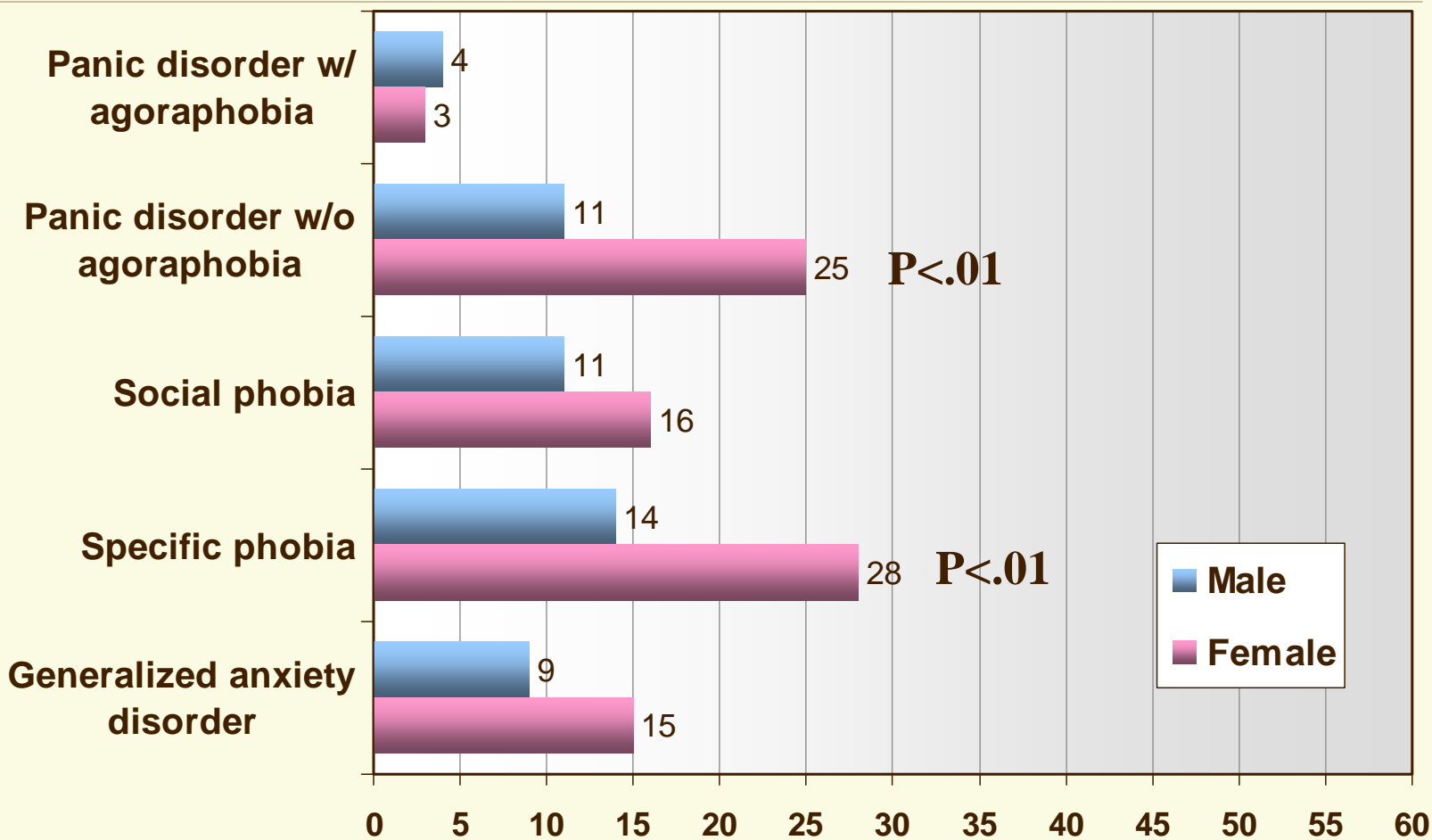
A silver metal spiral binding is visible on the left side of the page, consisting of a series of loops that hold the paper in place.

Inhalant Abuse and Mental Health Disorders

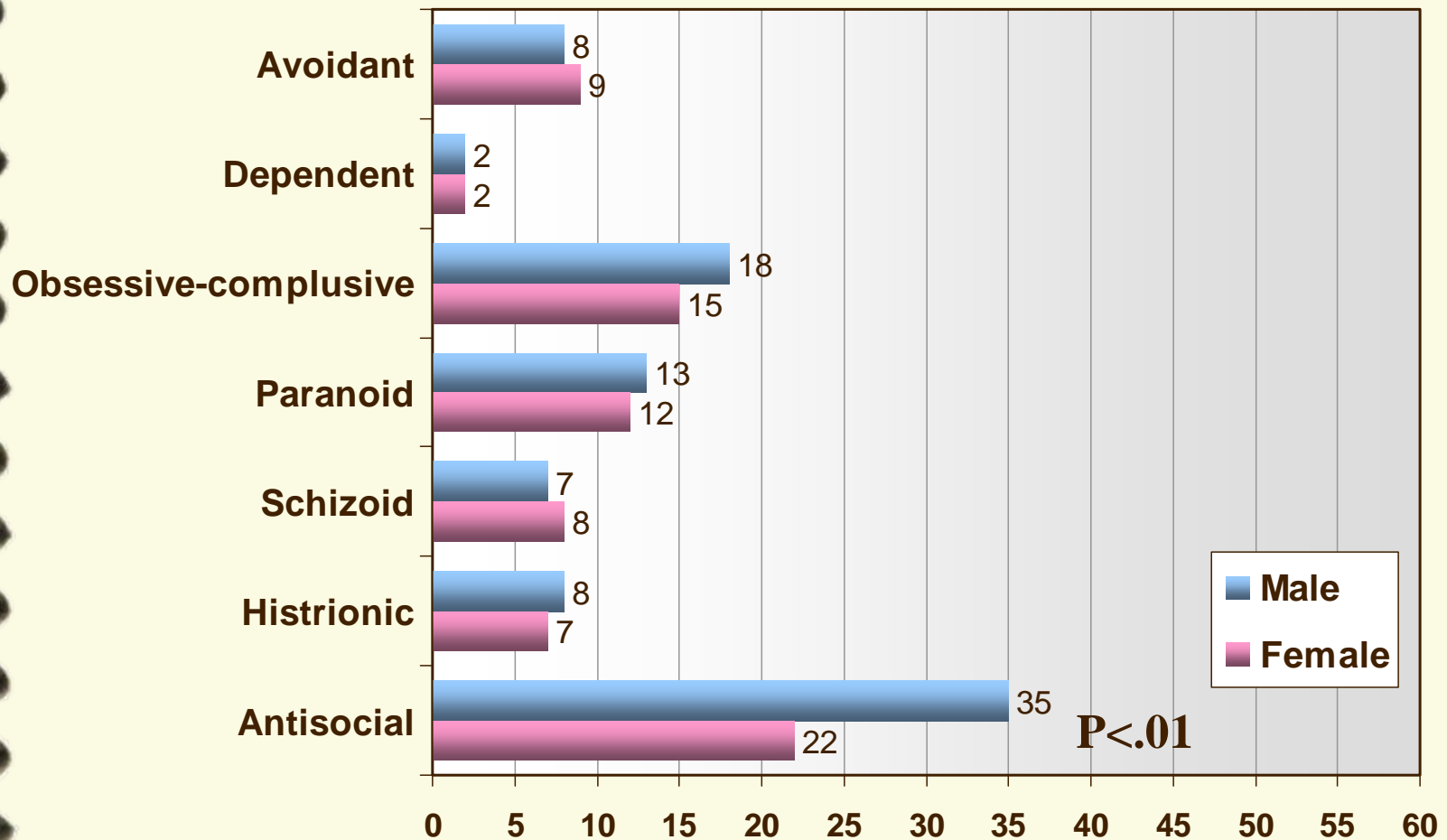
Prevalence (%) of lifetime mood disorders among adult lifetime inhalant users, by gender



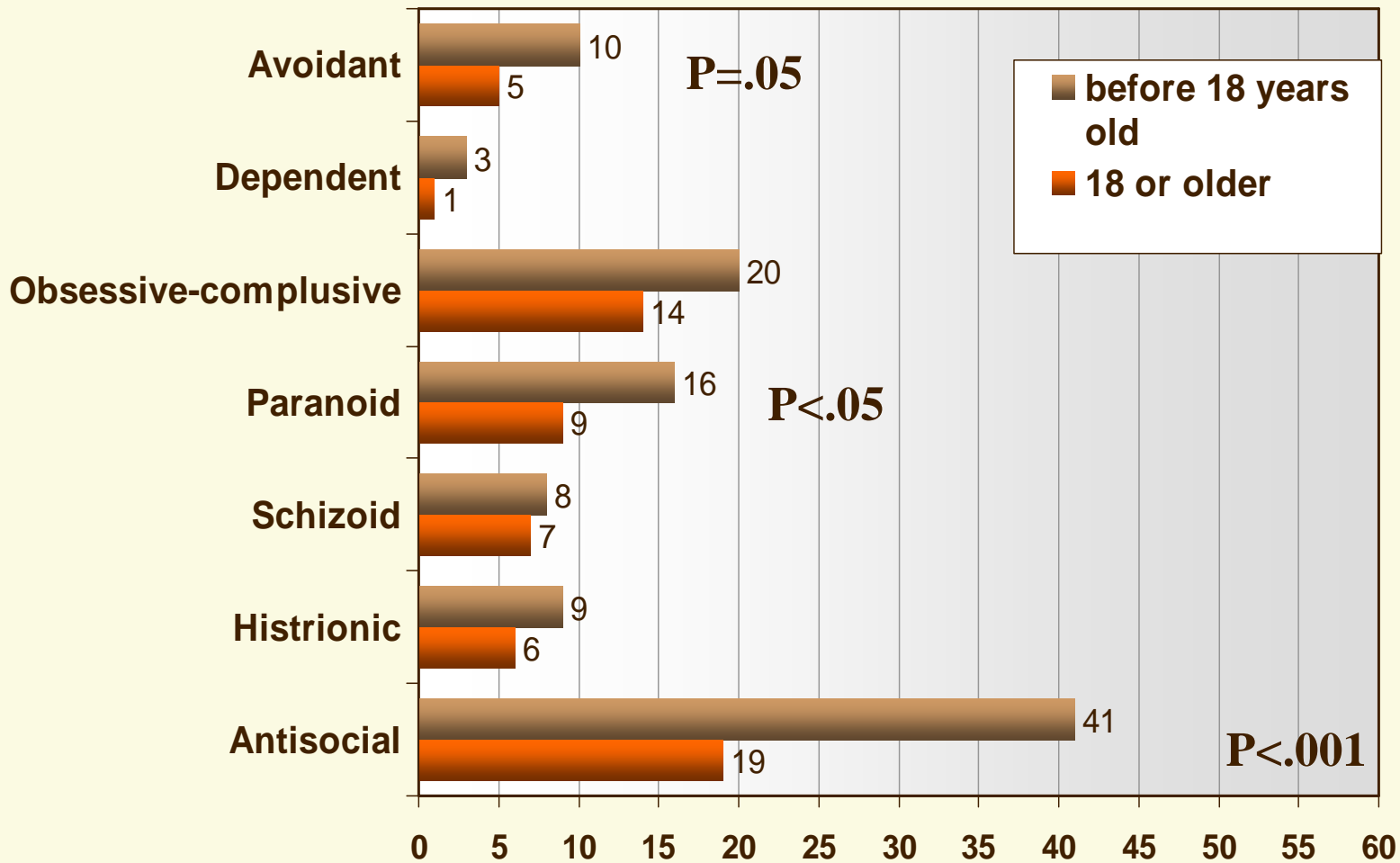
Prevalence (%) of lifetime anxiety disorders among adult inhalant users, by gender



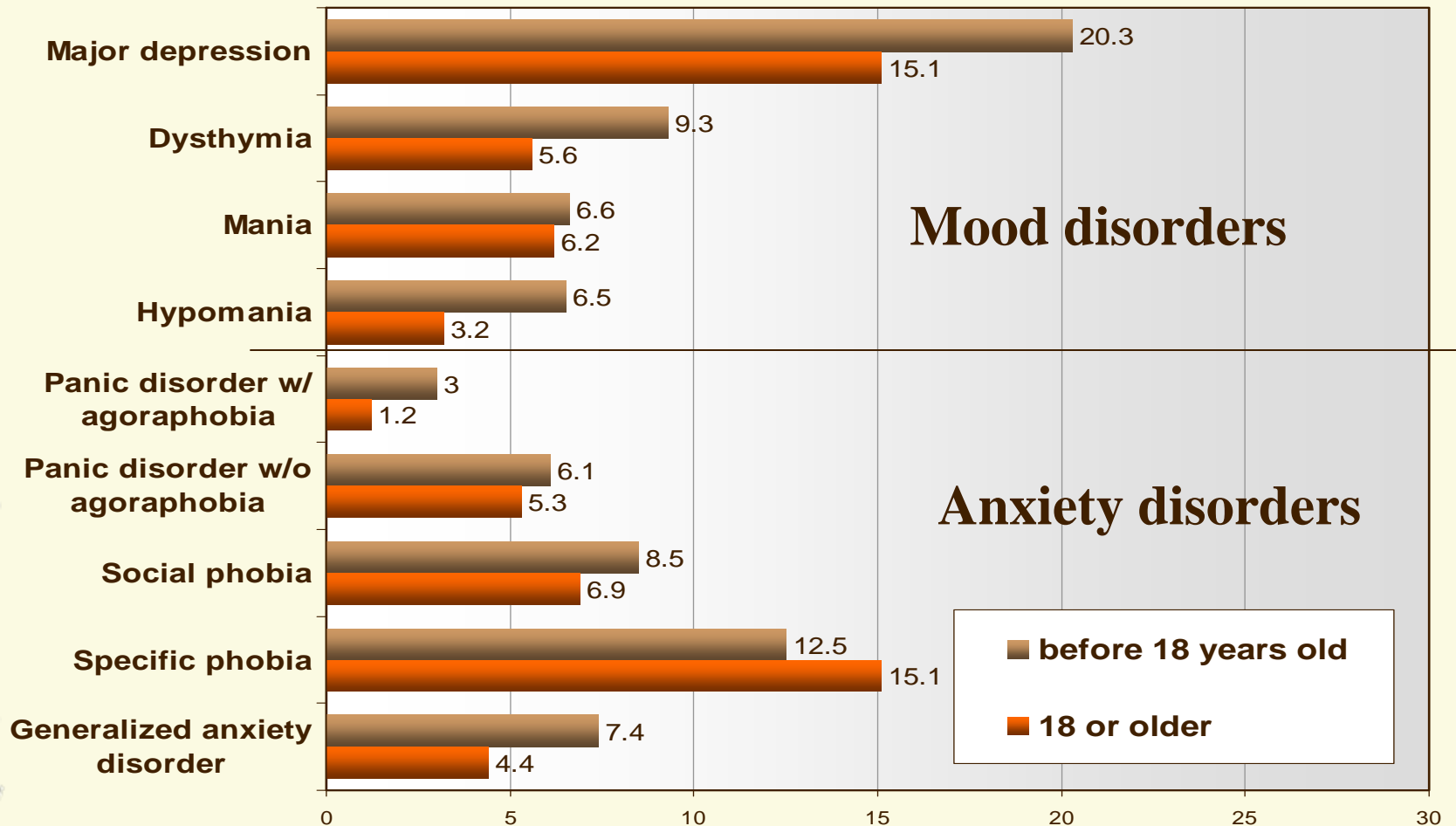
Prevalence (%) of lifetime personality disorders among adult lifetime inhalant users, by gender



Prevalence (%) of lifetime personality disorders among adult lifetime inhalant users, by age of onset of first inhalant use




Prevalence (%) of past-year psychiatric disorders among adult lifetime inhalant users, by age of onset of first inhalant use





Warning Signs

Warning Signs

 **“Highs” are temporary**

 **First clues**

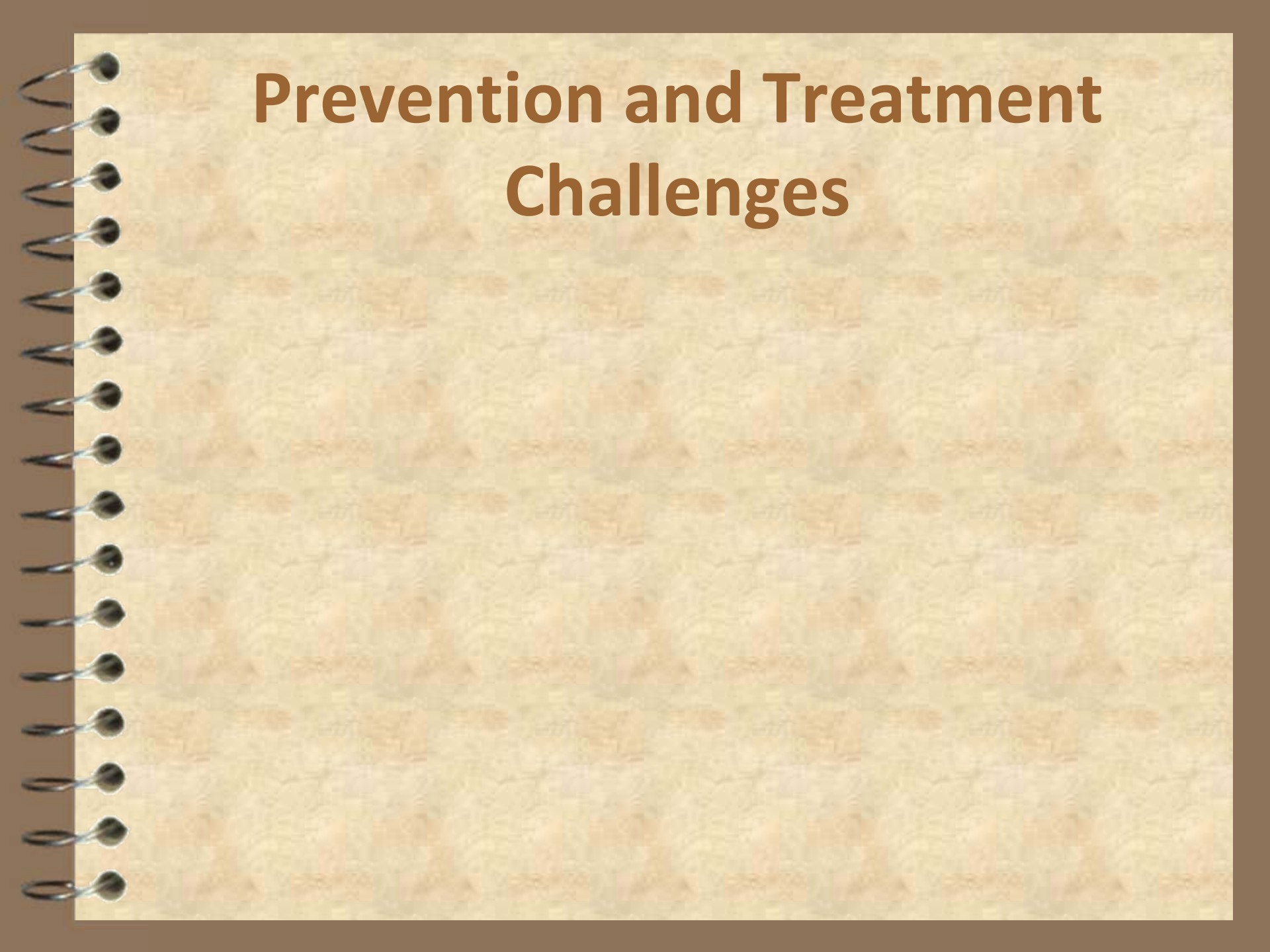
- Change in behaviors at home and school
- Drop in grades, loss of interest in favorite activities
- Change in group of friends or activities

 **Medical signs are often non-specific**

- Healthcare professionals often baffled by symptoms
- No quick diagnostic tests available

Warning Signs, cont.

- 📄 Chemical odor on body and clothes or in room
- 📄 Red, glassy, or watery eyes & dilated pupils
- 📄 Slow, thick, or slurred speech
- 📄 Staggering gait, disorientation, spastic movements
- 📄 Inflamed nose, nosebleeds & rashes around nose & mouth
- 📄 Pains in chest & stomach, headaches
- 📄 Intoxication, irritability, aggression
- 📄 Seizure, coma
- 📄 Shortness of breath
- 📄 Ink on nail beds

The image shows a spiral-bound notebook with a light brown, textured cover. The spiral binding is on the left side. The title is centered at the top in a bold, brown font.

Prevention and Treatment Challenges

Legal Substances

 **Inhalants have widespread legitimate uses for which they are legal.**

- Illegal to use as a drug in some states.

 **Legal manufacturing and distribution system**

- Manufacturers
- Retail
- Teachers
- Youth leaders
- Parents

Accessibility

Inhalants are ubiquitous

- Retail
- Schools
- Homes
- Offices
- Medical Settings
- Treatment Programs

Misconceptions Persist

- 📄 **Used inside the body/home so can't be dangerous**
 - Air freshener, cooking spray, whipped cream, nail polish, markers, paint
- 📄 **Not viewed as harmful or addictive**
- 📄 **Thought to be rare; Doesn't arouse suspicions of adults**
- 📄 **Risks unknown to many parents, adolescents, providers**

Treatment Options are Limited

Traditional drug treatment facilities do not like to admit inhalant abusers

- Failure rate is very high
- Testing difficulties
- Treatment takes months, possibly years

Inhalant abusers differ from drug abusers

- Often have multiple problems
- They're typically younger
- May be cognitively damaged by inhalants
- Treatment progress can be slower due to cognitive impairment
- Most treatment facilities not equipped or skilled enough to handle complexity of abusers' needs

Inhalation Abuse Detection...

Thorough History and Physical

- Networked with knowledgeable medical personnel

Blood tests:

- Elevated LFT(s)
- Specific urine testing
 - Urine metabolite
 - Benzene- check for phenol
 - Toluene- check for hippuric

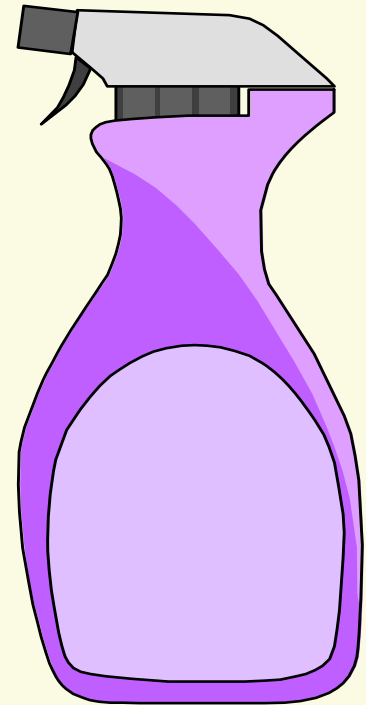
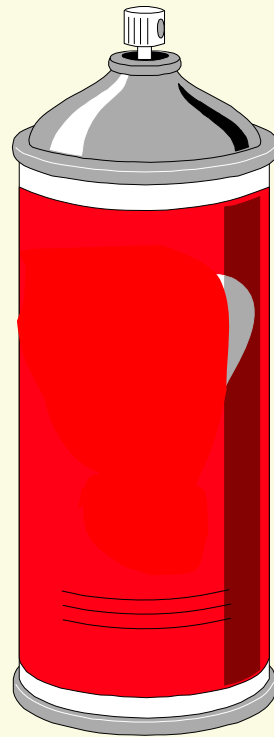
Prevention Strategies

 **Regulation and Legislation**

 **Product Reformulation and Labeling**

 **Awareness/Prevention/Education**

Product Labeling



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AIR DUSTER™

DIRECTIONS: Can must be upright when spraying. Do not tilt more than 40° while spraying or shake can during use. Before use, press actuator to clear valve of any liquid product especially when using on photographic negatives. Use extension tube in tight areas. Use short burst to prevent cooling of can. Do not breathe fumes. Avoid contact with skin and eyes. Store in a cool dry place.

CAUTION: CONTENTS UNDER PRESSURE. This product is not defined as flammable by 16 CFR, 1500.3, Consumer Products Safety Commission Regulations. **HOWEVER THIS PRODUCT CAN BE IGNITED UNDER CERTAIN CIRCUMSTANCES. Keep away from flames. Do not use while smoking. Do not spray on or around paper shredders or electrical motors as vapors may ignite. Do not expose can to heat or store at temperatures above 122°F (50°C). Do not store in direct sunlight or in enclosed vehicles. Exposure to heat may cause can to burst. Do not puncture or incinerate container even if considered empty as can may explode. Liquid contents may cause frost bite on contact with skin; therefore do not store in pockets, do not tilt, shake, or turn upside down before or during use. Contact physician if frostbite occurs. Avoid contact with flame or hot surfaces which can cause toxic vapor formation. Use only in a well-ventilated area. Do not spray into enclosed spaces, such as inside cabinets, closets or within small enclosures, as vapors may collect and exceed safe breathing levels. Vapor is heavier than air and displaces oxygen available for breathing.**

Contains Difluoromethane CAS: 75-37-6
KEEP OUT OF REACH OF CHILDREN.

**INTENTIONAL MISUSE BY DELIBERATELY
INHALING CONTENTS CAN BE FATAL.**

**PARENTS: STOP INHALANT ABUSE
SEE www.inhalants.org**

FIRST AID: Inhalation: Move to fresh air. Give artificial respiration if necessary. Skin: Flush with water. Ingestion: Do not induce vomiting. Call physician immediately. Eyes: Flush with water. If conditions persist, call physician.

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**CAUTION: CONTENTS
UNDER PRESSURE**
Read cautions on all panels

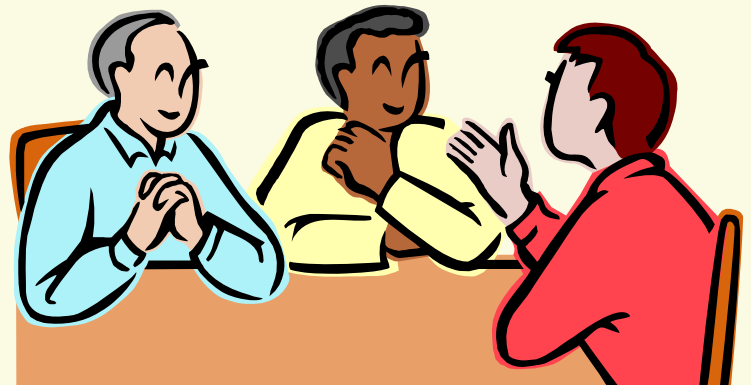
Net Wt. 10 oz. (284 g.)



**INTENTIONAL MISUSE BY
DELIBERATELY INHALING CONTENTS
CAN BE FATAL.**

Public Awareness

- **Individuals**
- **Schools**
- **Families**
- **Community**



Community

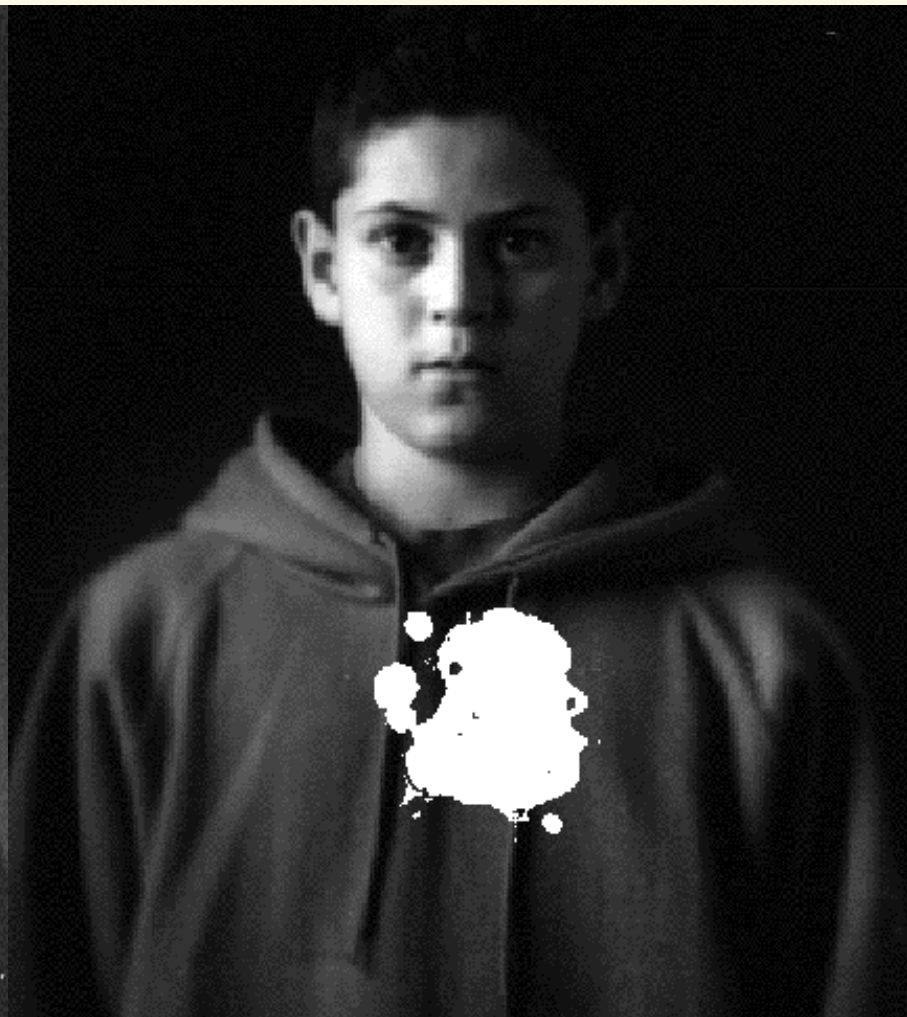
- **Business/retailers**
- **Health/medical personnel**
- **Law enforcement**
- **First responders**
- **Poison Control**
- **Faith-based**
- **Community agencies**
- **Volunteer organizations**
- **Media**





**SNIFFING MARKERS
DESTROYS YOUR BRAIN.**

Sniffing stuff like spray paint or markers can cause brain damage, lung damage, even death.



**SNIFFING CORRECTION FLUID
CAN STOP YOUR HEART.**

If you sniff to get high, you're inhaling poisons that do definite damage. So stop. Before your heart does.

Assessment & Treatment Considerations

Medical Screening

- Impairments in liver, kidneys, motor coordination, CNS, lungs, heart, hearing, vision, smell/touch


Neurological Tests

- Brain damage can occur from even occasional use

Mental Health/Emotional Problem Screening

Cognitive Tests

Assessment & Treatment Considerations

 Modalities specific to inhalation abuse not well studied so we tend to use the usual interventions with them:

- CBT
- Multi-system family therapy
- 12 step facilitation
- Motivational Enhancement techniques

Treatment Considerations: Inhalation Abuse

Recovery Model

- Carl Bell M.D.
- “Risk Factors are not Predictive Factors because of Protective Factors”
- Bell et al 2007
 - Identified five

Treatment Considerations: Inhalation Abuse

 Bell et al 2007

- Identified five empirically supported intervention principles that should be used to guide and inform intervention and prevention efforts at the early to mid-term stages for mass trauma intervention.

Promoting:

- 1. sense of safety
- 2. calming
- 3. sense of self and community efficacy
- 4. connectedness