Responding to the Dangers of Methamphetamine

Towards Informed Practices

CCJR
Centre for Criminal Justice Research
A SUN CENTRE OF EXCELLENCE

City of Chilliwack

BC Centre for Social Responsibility

Responding to the Dangers of Methamphetamine

Towards Informed Practices

Amanda V. McCormick[a], Darryl Plecas[b], and Irwin M. Cohen[c]

---

[a] Amanda McCormick is the Research Coordinator with the British Columbia Centre for Social Responsibility

[b] Dr. Darryl Plecas holds the RCMP Research Chair at the University College of the Fraser Valley. He is also the Director of the Centre for Criminal Justice Research and a professor with the School of Criminology and Criminal Justice at the University-College of the Fraser Valley

[c] Dr. Irwin M. Cohen is the Director for the British Columbia Centre for Social Responsibility and a professor with the School of Criminology and Criminal Justice at the University-College of the Fraser Valley

Acknowledgment:

This report was made possible through an initiative of the Public Safety Advisory Committee of the City of Chilliwack:

- Councillor Sharon Gaetz, Chair
- Councillor Chuck Stam, Co-Chair
- Mayor Clint Hames
- Dr. Darryl Plecas, University College of the Fraser Valley
- Amanda McCormick, University College of the Fraser Valley
- Dr. Irwin Cohen, University College of the Fraser Valley
- Superintendent Gary Brine, Chilliwack RCMP
- Inspector Keith Robinson, RCMP
- S/Sgt. Gerry Falk, Chilliwack RCMP
- Cst. Donna Collins, Drug Awareness Program, Chilliwack RCMP
- Mike Weightman, ICBC
- Kathy Funk, BIA
- Andrea Ormiston, Crown Counsel
- Ernie Charlton, Community Member
- Bruce Hutchinson, Community Member
- Dianne Garner, Community Member
- Sherry Mumford, Fraser Health Authority
- Taryn Dixon, Chilliwack School District
- Robert Carnegie, Director of Corporate Services, City of Chilliwack
- Fire Chief Rick Ryall, City of Chilliwack
- Assistant Fire Chief Ian Josephson, City of Chilliwack
- Garrett Schipper, Manager of Regulatory Enforcement, City of Chilliwack
- Karen Stanton, Manager of Development Services, City of Chilliwack

The authors would like to express their thanks to Patrick Neal for his assistance in collecting the information necessary for the completion of this report.

Executive Summary

The intention of this report is to collect and provide information on the use and production of methamphetamine, and the best practices currently in use in many jurisdictions to respond to its use, production, and distribution. In addition, this report provides direction to communities wishing to develop their own response to methamphetamine. This report was based on an extensive search of library databases, internet sites, and personal communications with experts in the field.

The results of this extensive search revealed that the use and production of methamphetamine was not equally distributed among communities either in Canada or internationally. Some communities have yet to be significantly affected by the sale, use, or production of methamphetamine, while other jurisdictions have experienced widespread epidemic use and/or production. For others, methamphetamine is a growing concern. However, regardless of the extent of the methamphetamine problem, there is a general consensus that methamphetamine is a serious, addictive drug that has far-reaching negative consequences for the user, their social networks, and the community.

As with other drugs, the use and production of methamphetamine presents a wide range of individual, familial, and community challenges. For instance, there is a well-documented association between crime and methamphetamine use. To obtain money for drugs, such as methamphetamine, users participate in various forms of criminal activity, such as breaking and entering, theft of property, and identity theft. Methamphetamine use is also associated with increased homelessness, as the user may be unable to keep a job while binging on methamphetamine. Properties are ruined by methamphetamine use and production in that, for example, homes that contain methamphetamine labs are often irreparably damaged or destroyed as the result of a chemical explosion. In addition, chemical waste may be dumped down drains or in public areas causing damage to not only the house that contains the lab, but to the surrounding environment. This wider exposure to harmful chemicals can contaminate members of the community. Compounding the problem and dangers, methamphetamine is a relatively easy drug to produce so labs can essentially be located anywhere, including near, for example, elementary schools.

Because the production of methamphetamine is relatively easy, many cities across North America have witnessed an increase in clandestine methamphetamine labs and even the development of superlabs. Rural parts of the country are particularly at risk for the establishment of methamphetamine labs as the relative isolation offered in rural areas provides methamphetamine producers a degree of privacy and the ability to avoid raising the suspicion of neighbours. Across British Columbia, methamphetamine labs have been found in towns such as Chilliwack and Abbotsford as a result of police investigations or due to an explosion or fire.

Although education has increased the levels of public awareness about the effects of methamphetamine, people are still at risk of unknowingly consuming the drug. For example, methamphetamine is often included in ecstasy tablets; research indicates that methamphetamine is present in up to 70% of

ecstasy sold in the street. This practice can result in people becoming addicted to methamphetamine before they are even aware that they are using it. An additional concern involves the new practice of producing "candy meth", or methamphetamine that is flavoured with orange, strawberry, cola, or chocolate flavours to make it more appealing to children and youth.

Methamphetamine use has the potential to damage brain neurons and cells. The use of methamphetamine results in the brain being flooded with dopamine, otherwise known as the "pleasure chemical". The release of dopamine and the subsequent state of euphoria that this produces results in many users of methamphetamine becoming addicted. While methamphetamine addiction has traditionally been viewed as basically untreatable, research indicates that some recovery is possible. Successful treatment of methamphetamine is essential not only for the user themselves, but also for their family. Many methamphetamine users and/or producers have small children whose well-being, development, and even lives are threatened by their close proximity to methamphetamine. In response to the psychological, emotional, and physical harms suffered by these children, drug endangered children's units have been established in the United States and, more recently, in Alberta, Canada. Unit members respond to a police takedown of a clandestine lab and attend to the needs of the children inside. Unit members are involved with these children for a lengthy period of time, ensuring that the children's best interests are kept in mind as their parents are investigated and prosecuted for methamphetamine production and/or child endangerment.

Lifetime rates of methamphetamine use range between 2% and 5% in North American. Recent research suggests that the rate of first-time use of methamphetamine has declined between 2004 and 2005. However, methamphetamine continues to pose serious challenges to communities world-wide due to the drug's potential to rapidly create addicts, its ability to be produced quickly and cheaply, its negative long-term negative consequences for chronic users, and the accompanying violence, criminal activity, and environmental contamination that threatens community members.

The review of the literature revealed a number of best practices currently operating in several jurisdictions. These practices can be applied to cities everywhere. Based on a review of this existing literature, the authors identified several areas in which recommendations can be made.

1. **Awareness Campaigns**

- Target awareness and education campaigns at those who may accidentally come into contact with methamphetamine waste (i.e. chemical dumps), such as children, housing employees, sanitation employees, park employees, or construction workers;
- Target awareness campaigns at specific sub-groups who may come into contact with methamphetamine production or use, including:
    - Hotel/Motel/Gas station employees;
    - Retailers of precursor chemicals;
    - Retailers of anhydrous ammonia;
    - Pharmacists;
    - Farmers;
    - School educators;

    - School children;
    - Parents; and
    - Health care workers (nurses, physicians, mental health);
- Awareness and education campaigns should include, but not be limited to, the use of public forums, school presentations, speaker's bureaus, newsletters, posters, media advertising, campaigns run in partnership with media organizations, and/or conferences;
- Prior to implementing an awareness campaign, research should be conducted to determine what methods have been evaluated and found to be most effective;
- To determine whether the campaign is effective in achieving its goals, levels of awareness should be assessed both before and after the implementation of any campaign;
- Awareness campaigns should emphasize that methamphetamine is not an individual problem, but a community problem;
- To accommodate increased awareness of methamphetamine among the community, a toll-free tip-line should be provided to allow the public to anonymously report suspicious activities related to methamphetamine;
- To accommodate increased awareness of methamphetamine among the community, a toll-free information line should be set up to answer any questions related to methamphetamine;
- To increase the public's awareness regarding the purchasing of property formerly used for methamphetamine production, a database of condemned housing and locations of former methamphetamine labs should be developed and made publicly available.

2. Access to Materials

- The effectiveness of GloTell should be researched and, if found effective, its use should be implemented in rural areas;
- In rural areas where ammonia is commonly used, the use of locks or tamper tags on ammonia tankers should be made mandatory;
- Given that retailers of precursor chemicals, such as ephedrine and pseudoephedrine, can access valuable information, such as the license information of those buying large amounts of chemicals, enforcement officials should establish strong working relationships with retailers of precursor chemicals.

3. Partnerships

- To increase awareness, knowledge, and access to resources, partnerships must be established between ministries and local community agencies, such as those related to public safety, children and families, education, the criminal justice system, health, housing, and the environment;
- If no integrated response team to methamphetamine exists, one should be established;
- Train-the-trainer sessions should be used to train first-responders on methamphetamine-related situations;
- Options for cost-sharing among ministries and community agencies should be identified.

4. Children

- Drug-endangered children teams should be developed with specific protocols outlining the contribution of each agency and each member of the team;
- These protocols should be re-evaluated, at a minimum, every five years;

- Drug-endangered children team representatives should be sent to view current drug-endangered children units already operating, for example, in Alberta, Seattle, or California.

5. Housing

- Where possible, bylaw legislation should be introduced to allow for cities to seize control of properties contaminated by methamphetamine;
- After reviewing a range of factors, such as zoning laws, community needs, and the availability of services and transportation, consideration should be given to decontaminating properties and developing them into public housing, for example, for use with at-risk groups such as street-youth, the homeless, or vulnerable seniors, or for use with inpatient treatment or as shelters;
- Protocols for decontamination should be reviewed and guidelines identifying which companies can be used and who is responsible for the cost should be developed.

6. Assessment of the Problem

- To develop a better understanding of both abuse and the production of methamphetamine, users and producers should be identified and interviewed;
- To develop a better understanding of the challenges related to methamphetamine, information on the use and production of methamphetamine (e.g. the location and size of methamphetamine labs) should be collected and incorporated into a shared database;
- To gather information for the database, brief forms to be used by hospitals, police, and prison regarding methamphetamine use and production should be developed and implemented.

7. Program Evaluation

- To determine effectiveness, programs (e.g. prevention, treatment) must be evaluated;
- Guidelines establishing program determinants for success, such as harm reduction or abstinence, should be identified;
- Programs must be evaluated by independent contractors for the results to be seen as valid;
- Evaluations should consider whether programs are consistently implemented across time and location, and whether they provide long-term community support.

8. Areas for Research

- *Public Awareness*: prior to implementing public awareness campaigns, research must be conducted to determine existing levels of methamphetamine awareness among, for example:
    - Educators;
    - School nurses;
    - Physicians;
    - Youth;
    - Hospitals and other front line workers; and
    - Parents.

- *Program Evaluation*: to ensure programs meet the needs of citizens, evaluations must ask, for example:
    - What programs are currently operating?;
    - Have they been evaluated?;
    - Who conducted the evaluation and what was the evaluation methodology?;
    - Did the results suggest success?; and
    - How can existing programs be improved?

- *Drug Courts*: drug courts provide alternatives to incarceration for non-violent offenders, but whether they are successful for methamphetamine users has not yet been validated:
    - How well are drug courts responding to and working with methamphetamine users?
    - Are methamphetamine users getting the treatment they need in their local communities?
    - What are the main reasons that methamphetamine users fail to successfully complete drug court programs?
- *Drug Endangered Children*:
    - What are the school policies with respect to children who use or are suspected of using methamphetamines?
    - What are the school policies with respect to children who are suspected of living in methamphetamine-contaminated housing?
    - What is the current level of information sharing among those responding to methamphetamine labs?
    - How are children taken from methamphetamine labs currently dealt with?

Table of Contents

CITY OF CHILLIWACK
OFFICE OF THE MAYOR

December 3, 2007

Dear Council Members and Staff:

Re: "Responding to the Dangers of Methamphetamines: Towards Informed Practices"

During the development of this report, we realized that, in the process of solving a difficult problem for our own community, we had a unique opportunity to assist members of other communities. To this end, we broadened the scope of our efforts and set out to prepare a report that would be relevant to communities throughout North America. The publication that you are holding was funded in part by the Province of British Columbia's "Community Methamphetamine Response Funding Program" and in part through a partnership between the City of Chilliwack and the Centre for Criminal Justice Research. It has been published and presented as a gift from our community to yours in hope that you will find it to be of some assistance in dealing with methamphetamines or other substance abuse challenge in your community.

This report represents the most comprehensive survey of substance abuse response strategies compiled to date. We believe that it will be an invaluable tool in identifying proven best practices that have produced positive results elsewhere in the world and which show promise for assisting us to deal with this serious problem at home. Please read it, share it and use it to help make your community a better place to live.

Yours truly,

Clint Hames
Mayor

8550 Young Road, Chilliwack, British Columbia V2P 8A4
Phone: (604) 792-9311 Fax: (604) 792-2561

Introduction

In 2005, the provincial government of British Columbia allocated $7 million to help combat crystal methamphetamine use and production. In March 2006, British Columbia's Health Minister George Abbott announced the release of an additional $8 million targeted towards crystal methamphetamine treatment options and youth addictions services. The funding was earmarked for the development of treatment programs, such as individual and group counselling, and recovery support programs for users of methamphetamine and their families. An additional $2 million over the next three years was also set aside for the Crystal Meth Secretariat to be used to integrate and coordinate efforts to fight the production and use of crystal methamphetamine, also known as methamphetamine.[1] This report discusses the nature of amphetamine drugs, the extent of the problem, and the practices used in many jurisdictions to respond and combat methamphetamine use and production.

In some countries, including Australia, China, Indonesia, Malaysia, Thailand, and the Czech Republic, as well as in some provinces in Canada, methamphetamine use and production appears to be a growing problem. In other countries, such as the United Kingdom and some American states, its use appears to have peaked.[2] Alternatively, some countries, such as Germany, Greece, and some jurisdictions in the United States and Canada have not experienced any substantial problems related to the use or production of methamphetamine.[3] However, regardless of the extent of the problem, there is general consensus with respect to the fact that methamphetamine is a serious, addictive drug that has far-reaching negative consequences for individuals and communities. According to a recent United Nations report:

"[m]ethamphetamine abuse has become a serious health, law enforcement and political concern and the fastest-growing drug threat".[4]

Given this national and international level of consensus, it is essential that information regarding the manner in which different jurisdictions have responded to methamphetamine-related challenges be collected and disseminated, in part, to allow for best-practices to be implemented in all jurisdictions attempting to prevent and/or respond to methamphetamine use and production.

In addition, regardless of whether a community currently has any identifiable problems related to methamphetamine, many of the issues related to methamphetamine use can also be applied to other drugs. Therefore, whether or not communities are experiencing methamphetamine-specific problems today, there is always the possibility that new and different drugs will become popular. For instance, research has recently reported on the increasing misuse and abuse of prescription drugs among high-school youth. Such reports are an indication that new forms of drug abuse are appearing. The prevention and awareness tactics that are used in relation to methamphetamine may also be applicable in preventing the use of alternative types of drugs.

This report was commissioned by the city of Chilliwack, who identified the need to collect and disseminate information on the practices used in other jurisdictions to provide direction to communities wishing to prevent and respond to the use and production of

methamphetamine. Over the course of several months, a wide range of independent sources with information specific to methamphetamine were identified and integrated into this final report. These sources included: government reports; editorials; peer-reviewed journal publications; personal communications with experts in the field; online reports; magazine articles; fact sheets; websites; and newspaper reports. A number of different journal sources were identified, including articles in journals related to: nursing; medical health; biomedics; psychology; psychiatry; policing; corrections; criminology; social work; public health; addictions; business; child health and welfare; and toxicology. Together, these sources emphasized the far reaching dangers and effects of methamphetamine use and production among communities today.

"Responding to the Dangers of Methamphetamine: Towards Informed Practices" is a valuable compendium of best practices, advice, and insight on how to prevent and address the impact of methamphetamine on individuals, families, and communities across Canada. I highly encourage educators, government officials, frontline professionals, and the many other critical partners to use the extensive information found in this publication to guide their action as they deal with this important public health and community safety issue.

Michel Perron, CEO of the Canadian Centre on Substance Abuse

Methamphetamine: The Nature and Extent of the Problem

Amphetamines are stimulant drugs that affect the central nervous system. However, not all forms of this drug are either illegal or used exclusively recreationally. For example, one form of amphetamine (d-isomer or dexamphetamine) is used for clinical purposes in the treatment of Attention Deficit Disorders.[5,6] Methamphetamine shares a similar chemical makeup with amphetamine, however, its effects are more intense and longer lasting.[7,8] Methamphetamine also has the potential to do more damage to the central nervous system.[9] Users of amphetamines or methamphetamines are at high risk of forming a dependence on the drugs, which may also lead to negative psychiatric, health, and social functioning impacts.

Methamphetamine was originally derived from amphetamine in 1893 by a Japanese pharmacologist. In the 1930s, amphetamines were used to treat various medical ailments, such as asthma, schizophrenia, and narcolepsy. Amphetamines were also used by Japan, America, and Germany in World War II to prevent soldiers from becoming fatigued and to enhance their performance. In addition, methamphetamines were given to Japanese factory workers during the war to increase productivity.[10] These uses continued after the war and methamphetamines became popular in the 1950s with students and truck drivers who used it as a way to stay awake for long periods of time.[11] Based in part on its popularity, in the 1960s, methamphetamine began to be produced and distributed by California motorcycle gangs.[12] However, problems resulting from the use of amphetamines in the 1960s and 1970s resulted in the introduction of legislation designed to restrict legal production. These pieces of legislation had the effect of creating an entire network of clandestine methamphetamine labs focused on the illegal production of amphetamines.[13]

Although methamphetamine has been used for over a century, research suggests that the methamphetamine produced today is much different than its predecessors. The Centre for Addictions Research in British Columbia reported that current crystal methamphetamine is five times more potent than the speed used in the 1970s. The purity levels of today's crystal methamphetamine approaches 100%. The knowledge required to produce methamphetamine is readily available on the internet and the ingredients required include products commonly found in many households. Today, methamphetamine is available in a smokable form which may attract those who are unwilling to inject drugs and which is also much cheaper and much more accessible than the speed of the 1970s.[14] Moreover, there are many more uses for methamphetamine today than in the past.

Historically, methamphetamine was used exclusively to treat medical symptoms. In fact, in addition to being prescribed by physicians, some people used methamphetamine to self-medicate symptoms of depression or Attention Deficit Disorder. Given methamphetamine's tendency to stimulate the sex drive, others report the use of this drug to enhance sexual pleasure. Moreover, some women who are stay at home wives or mothers report using methamphetamine to increase their productivity, while some women use the drug to assist in weight loss; some have referred to the use of methamphetamine for weight loss as the

"Jenny Crank diet". Others (e.g. truck drivers, students, executives) report using methamphetamine to stay awake and focus their attention. Athletes may use methamphetamine to improve their physical performance.[15,16] In addition, methamphetamine is also now often referred to as a "club drug", given its popular use at dance parties and clubs.[17] As a testament to the increasing popularity of methamphetamine in rave or club scenes, most of the methamphetamine trafficked in Quebec is in tablet form, which allows the user to more easily ingest the drug at a club.[18]

Global use of amphetamine and methamphetamine, which is estimated to be approximately 40.4 million users, is second only to cannabis. Using drug seizures as a measure of production, methamphetamine is found largely outside of North America. Research conducted in 2003 indicated that less than one quarter (21 per cent) of methamphetamine seizures occurred in North America, while the majority (76 per cent) occurred in East and Southeast Asia.[19] Interestingly, in Japan, methamphetamine is the most highly abused drug. In fact, methamphetamine accounted for the large majority (83.5 per cent) of drug-related arrests in Japan. Methamphetamine also appears to be the drug of choice in other countries, such as the Philippines, the Republic of Korea, and Thailand.[20]

However, methamphetamine production and use have reached national attention in both Canada and the United States.[21] The majority of the methamphetamine produced in Canada is the result of domestic manufacturing; however, the increasing presence of organized criminal groups in the production of methamphetamine has resulted in an increase in the amount of methamphetamine produced in Canada trafficked into the United States.[22] Even given the media attention on this issue, research suggests that slightly less than 5% of Americans, approximately 11.7 million people, have used methamphetamine in their lifetime.[23] Still, in a recent survey of law enforcement personnel, conducted by the American National Association of Counties (NaCO), 58% of counties identified methamphetamine as their primary problem drug, followed by cocaine (identified by 19 per cent), marijuana (17 per cent), and heroin (3 per cent).[24]

Methamphetamine is also believed to be growing in popularity among school-aged children. A 2004 American survey concluded that 5.3% of high school sophomores and 6.2% of high school seniors have tried methamphetamine.[25] Research suggests that while the prevalence of methamphetamine abuse among the general population of Canada is generally declining, it appears to be rising among youth; in particular, among street youth and those who are involved in the rave or club scene.[26] Other research indicated that 20 to 29 year olds reported the highest levels of methamphetamine use in the United States. This is particularly concerning given that these individuals often have young children who are at risk of being exposed to methamphetamine abuse or production.[27]

Similar research has indicated that methamphetamine use and production is also an issue in Canada. A survey conducted by the Institute for Safe Schools in British Columbia identified that 3.4% of secondary school students had used crystal methamphetamine in the community, while 2.7% had used it at school and 2.5% had used it at school events.[28] In addition, the rate of methamphetamine-related deaths doubled in British Columbia from 2003 (15 deaths) to

2004 (33 deaths).[29] It is important to note, however, that the use of amphetamines is not evenly distributed throughout Canada. In fact, amphetamine use varies by province and community. For example, a Saskatchewan survey in 2004 identified the average prevalence rate of crystal methamphetamine use at 19%, ranging from 6% among 12 to 14 year olds to 48% of 19 to 24 year olds. However, within the province, the use of crystal methamphetamine varied widely. For example, it was reported that youth using crystal methamphetamine were straining the resources of the Yorkton area; however, in Swift Current, crystal methamphetamine use was rare.[30]

Part of the concern with amphetamine is that it can be produced in many different forms allowing for a wider range of ingestion methods. For instance, methamphetamine hydrochloride is produced as chunky white crystals. These crystals are commonly referred to as crystal methamphetamine or ice, glass, or tina. This form of the drug, which is a more potent form of methamphetamine, is most often smoked.[31, 32] Methamphetamine is also known as crystal, crank, jib, speed, chalk, gak, yaba (tablets with methamphetamine and caffeine) or meth, and it usually is produced into a white, odorless, bitter tasting powder that dissolves easily in water or alcohol.[33, 34, 35, 36]

Methamphetamine can be taken orally or by smoking, injecting, or snorting. When smoked or injected, methamphetamine has an almost immediate effect, whereas snorting the drug can result in a delay of up to five minutes before an effect is felt. Oral consummation may require approximately 20 minutes for the effect to be felt.[37, 38] Some users dissolve methamphetamine and consume it in a liquid drink, such as coffee.[39] Not only is effect time dependent on the method of consumption, but absorption rates by the body also vary, for example, when methamphetamine is snorted, nearly 80% of the drug reaches the bloodstream. In contrast, when smoked, between 37% and 67% of the drug reaches the bloodstream.[40]

Users who mainly inject methamphetamine differ in important ways from those who exclusively smoke it. One study conducted in Japan with nearly 500 methamphetamine users concluded that those who injected methamphetamine were significantly more likely to have a history of parental absence, a family history of alcoholism, limited education, and/or a criminal record compared to those who smoked methamphetamine or those who began smoking and graduated to injection. Despite the common perception that smoking methamphetamine is safer than injecting it, those who smoked methamphetamine were not only at risk of escalating their use to injecting the drug, but also tended to more commonly experience psychotic episodes following their first use of methamphetamine.[41]

One of the main concerns with methamphetamine is that it is highly addictive. Methamphetamine acts quickly by releasing a neurotransmitter (dopamine) within the body. The release of dopamine produces feelings of euphoria, more energy, greater alertness, feelings of pleasure, and reduces feelings of hunger.[42,43,44] In part, as a result of the chemical effects this drug has on the brain, methamphetamine is both physically and psychologically highly addictive. Given this, methamphetamine is classified as a schedule II stimulant in the United States.[45]

The use of amphetamines, such as methamphetamine, is devastating not just to the user, but their family and friends, and the community at large. The Saskatchewan police reported increased suicide rates, property crimes, and violent crimes as a direct result of crystal methamphetamine use. In addition to the harm caused to the individual drug user, there are familial and community harms associated with methamphetamine use and abuse. For instance, front-line workers, such as law enforcement, paramedics, and emergency room staff, are often at risk for physical harm due to the unpredictable, aggressive behaviour of methamphetamine users.

Communities may be harmed by a wide range of behaviours, such as the dangerous driving of people on methamphetamine.[46] As will be discussed in the Production of Methamphetamine section of this report, communities are also at risk when citizens produce methamphetamine in clandestine labs, as there is an increased risk of explosion or fire from the combination of chemical ingredients. These risks are specific not only to firefighters and police who are called to respond to toxic fires, but also to the community whose water and food supplies are threatened by potential environmental contamination.[47]

Communities can also be affected by the association between an increased risk for homelessness and methamphetamine use. Use of methamphetamine can result in unemployment and homelessness. There are anecdotal reports of methamphetamine users living in their cars with their children or taking over abandoned housing. Youth can also become homeless as a direct result of methamphetamine use, either by being kicked out of their homes or being kicked out of group homes or other living arrangements, such as a shelter.[48]

Methamphetamine abuse can also be extremely costly to businesses. A 2004 study in the state of Arkansas identified lost productivity, increased workers compensation costs, higher health-care costs, and increased absenteeism as common outcomes of having employees who were abusing methamphetamine. This represented a cost of approximately $47,500 a year for the employer. In one small county in Arkansas, researchers estimated that methamphetamine use by employees cost county employers approximately $21 million a year. Even one employee using methamphetamine can potentially cause enormous harm to a company's finances.[49]

The social, economic, and physical harms associated with methamphetamine use are increased because many methamphetamine users are poly-drug users. Among drug court clients in Kentucky, for example, users of methamphetamine were significantly more likely than non-methamphetamine users to report using alcohol, cocaine, inhalants, sedatives, other opiates, other stimulants, and hallucinogens. In addition, methamphetamine users were significantly more likely to report the use of more than one substance in a day.[50] This presents a wide range of problems, particularly in terms of treatment. In addition, methamphetamine users who use multiple drugs simultaneously increase the risk of death or other serious medical problems due to the potential for a dangerous interaction of different drugs within their bodies.

Users of methamphetamine are also distinguished from non-users by their criminal histories. There is a well-

documented association between methamphetamine use and rates of arrest, incarceration, and reported criminal behaviour.[51] Although reporting fewer criminal convictions than non-users, methamphetamine users in a Kentucky drug court sample reported higher levels of criminal behaviour and criminal involvement than non-users. Methamphetamine users were significantly more likely to report engaging in thefts, stolen property offences (holding, selling, or knowingly buying), drug dealing, and breaking and entering.[52] Moreover, in Arkansas, between 1995 and 2002, arrests for methamphetamine jumped from 1,217 to 3,215.[53] Other reports indicated an overall increase in the proportion of arrestees who tested positive for methamphetamine.[54] A similar pattern was found in Canada. Between December 2002 and September 2003 charges associated with methamphetamine included 200 charges for fraud, 1,200 charges related to the illegal gathering of information on another's personal identity, and 2,000 charges for credit card infractions.[55]

Although recent research indicates that the rate of initiation (i.e. first time users of methamphetamine in the past 12 months) declined between 2004 and 2005, methamphetamine use continues to be an issue.[56] American research indicates that there are high levels of methamphetamine use in the West, including the states of Seattle, San Francisco, Los Angeles, San Diego, and Honolulu. Methamphetamine use is also continuing to spread across the United States with increasing rates in the South and Midwest regions, particularly in rural areas. Furthermore, methamphetamine use is reported to be the fastest growing drug issue in metropolitan Atlanta.

A new concern regarding methamphetamine use among youth is the introduction of "candy meth". Candy meth is essentially methamphetamine combined with flavours, such as chocolate, orange, strawberry, or cola, to make the drug more appealing to youth. Recently, this new form of methamphetamine was discovered in Nevada and San Francisco. The discovery in Nevada involved "strawberry quick" or methamphetamine tinted red and cooked and flavoured to appear like candy. Methamphetamine of this nature can be introduced to children and youth who do not know that they are taking a dangerous and addictive drug. For example, one treatment provider acknowledged that a patient who used this form of methamphetamine had been told that it was a solidified form of a popular energy drink. Law enforcement and treatment providers have concerns about the introduction of this drug to unsuspecting children and youth who may subsequently take too much of this "candy" and overdose, or who may be using methamphetamine unknowingly.[57]

In 2005, approximately 1.3 million people in America aged 12 and older reported using methamphetamine in the past 12 months.[58] Increases in emergency rooms and treatment programs for methamphetamine related issues also attest to the fact that methamphetamine use continues to be an issue.[59] More specifically, abuse of stimulants was the identified problem for 8% of treatment admissions in the United States in 2004; 99% of this stimulant abuse involved methamphetamine or amphetamines.[60]

The 2005 National Survey on Drug Use and Health in the United States reported that approximately 4.3% of individuals aged 12 and over (10.4 million people) tried methamphetamine at least once during their

lives. In addition, 1.3 million people reported the use of methamphetamine in the past year, while rates of current use exceeded 500,000 people. The 2005 Monitoring the Future Survey by the University of Michigan showed similar rates of methamphetamine use in high school students. Of high school seniors, 4.5% reported that they had used methamphetamine at least once, while the rates of lifetime use for grade 8 and grade 10 students were 3.1%, and 4.1% respectively.[61] The 2006 Monitoring the Future Survey reported that overall rates in high school drug use had decreased, especially among older teenagers. However, the results indicated that, while methamphetamine use had declined significantly among Grade 10 students, it had not changed for Grade 8 or Grade 12 students. The annual prevalence rates of methamphetamine use were now 1.8%, 1.8%, and 2.5% for Grade 8s, 10s, and 12s, respectively. These rates were higher than that for crack cocaine, which were 1.3%, 1.3%, and 2.1% respectively. The 2006 survey separated amphetamine use into the use of amphetamines, methamphetamine, and crystal methamphetamine. Table one presents the relative rates of lifetime, annual, and past-month use for this group of high school students.

Overall, more than one third (39.5 per cent) of students believed that using amphetamines once or twice was a great health risk, while slightly more than two thirds (68.1 per cent) believed that using amphetamines regularly posed a great health risk. A slightly lower percentage, but still a majority (59.1 per cent), felt similarly about using crystal methamphetamine once or twice. Moreover, there was a general social stigma associated with the use of crystal methamphetamine as 80% of students disapproved of those who used amphetamines. While there was this prevailing social stigma, accessibility of methamphetamine was still considered high. Nearly 21% of Grade 8 students thought amphetamine was easy to get, while an additional 14.5% agreed that crystal methamphetamine was easy to get. Grade 10 students were most likely to agree that it was easy to get amphetamines (34.7 per cent) and crystal methamphetamine (20.8 per cent), while Grade 12 students were the most likely to agree that it was easy to get amphetamines (52.9 per cent) and crystal methamphetamine (26.7 per cent).[62]

Table 1: Monitoring the Future Survey data 2006

	Grade 8	*Grade 10*	*Grade 12*
Lifetime use of …			
Amphetamine	7.3%	11.2%	12.4%
Methamphetamine	2.7%	3.2%	4.4%
Crystal Meth	-	-	3.4%
Annual use of …			
Amphetamine	4.7%	7.9%	8.1%
Methamphetamine	1.8%	1.8%	2.5%
Crystal Meth*	-	-	1.9%
Past month use of …			
Amphetamine	2.1%	3.5%	3.7%
Methamphetamine	0.6%	0.7%	0.9%
Crystal Meth	-	-	0.7%

*** Questions regarding crystal meth were only asked of Grade 12 students**

Canadian research provided similar results. The Ontario Student Drug Use Survey in 2005 concluded that 2.2% of students reported using methamphetamine in the past 12 months.[63] Between 2003 and 2004, the Canadian Addiction Survey was conducted with a sample of 13,909 Canadians who were 15 years old and older. This survey asked Canadians to self-report their use of alcohol and drugs. Lifetime use of speed (another name for methamphetamine) was reported by 6.4% of the sample. Over half of this group

reported experiencing a range of problems associated with their drug use, including physical health and harm to friendships and relationships, employment, and financial position. In this sample, cocaine was a more commonly used drug than methamphetamine with lifetime rates reported at 10.6%.[64] The Addiction Foundation of Manitoba re-analyzed the Canadian Addiction Survey data and identified that the highest rates of methamphetamine use were found in British Columbia (5.1 per cent of the BC sample or approximately 190,000 users). The province with the next highest rate was Alberta (4 per cent) followed by Manitoba (3 per cent) and Saskatchewan (2.8 per cent).[65]

Methamphetamine and Cocaine Use

As methamphetamine and cocaine are both nervous system stimulant drugs, methamphetamine is often compared with cocaine. However, these drugs are distinguishable in a number of important ways. For instance, methamphetamine is a synthetic or man-made drug, while cocaine is naturally occurring, deriving from plants. Recipes for methamphetamine production are available on the internet and methamphetamine labs can be easily set up in houses, cars, or hotel rooms. Although producing similar effects, the effects of cocaine typically last only minutes, whereas methamphetamine effects can last from six to eight hours.[66] Methamphetamine is also cheaper to purchase than cocaine and is more readily available. Depending on the region, methamphetamine can cost as little as five Canadian dollars a day.[67] A report in Edmonton, Alberta indicated that for ten dollars, a user could get high on methamphetamine and feel the effects for up to twelve hours, whereas use of crack cocaine would likely produce a high lasting around 20 minutes for the same amount of money.[68] This likely contributed to the reason why the use of methamphetamine surpassed that of cocaine in the 1990s.[69]

Given the similarities between methamphetamine and cocaine, users are often treated similarly. However, methamphetamine dependent users often present symptoms that are either distinct from cocaine or have much more severe symptoms. For instance, while both cocaine and methamphetamine dependent treatment clients may present with symptoms of depression, the methamphetamine user's depression is commonly more severe in nature. Methamphetamine users are also more likely to receive psychiatric diagnoses and to be treated with psychotropic medications that alter perceptions, emotions, or behaviours (e.g. tranquilizers, sedatives, or antidepressants).[70]

Effects of Methamphetamine Use

Short-Term Effects

In an attempt to maintain their high, users of methamphetamine often binge on the drug, administering up to 20-40 mg every two or three hours over a lengthy period of time.[71] This practice results from the quick buildup of tolerance to the effects of methamphetamine. As the user becomes more resistent to the effects of the drug and needs greater amounts of the drug to feel the same effect, the user will begin to use methamphetamine every few hours until either there is none left or they have become too disorganized to continue using it.[72, 73] Tolerance to methamphetamine can result not only in an increased frequency of use, but the user may also increase the dosage used

each time or change the method of ingestion, for example from smoking to injection.[74]

Methamphetamine use produces a range of experiences, including: insomnia; confusion; aggressiveness; increased confidence; increased libido; excessive talking; hyperthermia; increased irritability; anxiety; paranoia; and restlessness. Methamphetamine also affects the respiratory system, increasing the heart rate and blood pressure.[75]

Methamphetamine can have an immediate physical/neurological impact by destroying brain tissue, even after only one use. Methamphetamine use can damage the nerve cells in the brain that produce dopamine, also known as the "pleasure" chemical. This can occur because the use of methamphetamine floods the brain with dopamine.[76] Dopamine is a neurotransmitter that plays a role not only in the experience of pleasure, which is why methamphetamine users experience a sense of euphoria when on the drug, but also effects motivation and motor function. Most drug abuse involves the release of dopamine; however, methamphetamine differs in that there is a much larger amount of dopamine released, which can have a negative effect on the nerve terminals in the brain.[77] Methamphetamine releases approximately 12 times the amount of dopamine released in other pleasure-related activities, such as food and sex. However, after the effect wears off, users can experience severe depression resulting in the need to continue taking methamphetamine to avoid the crash period.[78]

The excessive release of dopamine in the brain increases the likelihood that the chemistry of the brain will be negatively affected. This increases the possibility of developing a range of psychiatric illnesses (e.g. depression, schizophrenia), insomnia, and movement disorders in the future.[79] The risk of changes to brain chemistry increases as methamphetamine use increases. With each dose of methamphetamine, users risk destroying the brain's wiring and potentially decreasing the ability to feel pleasure. Dr. John Averitt, a psychologist and drug treatment counselor in Cookeville, Tennessee, stated:

"A chronic meth user's brain is never the same again. Normal pleasures, like a trip to the beach or a pleasant meal, no longer feel good. You've got to keep using the drug to feel that pleasure, or take the drug to stop the terrible feelings that result".[80]

This damage can persist for years after one stops using methamphetamine. Some research indicates that damaged dopamine receptors can re-grow over time; however, the cognitive abilities that are damaged by methamphetamine use may never be repaired. Years after use, users may continue to suffer memory, judgment, and motor coordination impairments.[81] Brain imaging of long-term users of methamphetamine indicated damage similar to the effects of a stroke or Alzheimer's disease.[82] Brain imaging also showed indications of reduced motor speed and impaired verbal learning.[83] Moreover, prolonged methamphetamine use can result in damaged blood vessels in the brain increasing the risk of stroke.[84] In the United States, amphetamine-related visits to the emergency room increased substantially between 1995 and 2002 from 25,254 to 38,961 visits.[85]

In addition to the psychological/neurological effects of methamphetamine use, there are also a number of other negative health risks

associated with methamphetamine use, including heart problems or disease, brain hemorrhage, or stroke. Short-term use of methamphetamine can increase heart rate, blood pressure, breathing rate, and body temperature, and can also result in excitation and excessive talking.[86] Additional negative effects include anxiety, stomach cramps, shaking, insomnia, aggression, convulsions, brain damage, and hallucinations.[87] The method of use also has a range of physical effects. For instance, injecting methamphetamine increases the risk of HIV (Human Immunodeficiency Virus), Hepatitis B, Hepatitis C, abscesses, and infections; Injecting methamphetamine can also lead to a medical condition called endocarditis or an inflammation of the lining of the heart. This condition is potentially life threatening if not treated properly.[88] Snorting or smoking methamphetamine can lead to damage of the nasal tract, coughing up blood, choking, and breathing problems.[89]

One of the primary effects of methamphetamine is to decrease appetite and, with the body unable to detect hunger while on a binge, the user may go for days without eating. This can result in serious cases of malnutrition and extreme weight loss.[90] Methamphetamine also reduces the need for sleep. There are reports of methamphetamine users going without sleep for as long as three weeks. One of the outcomes of prolonged sleep deprivation is an increase in the propensity for violence. Methamphetamine use can result in short and/or long-term psychosis.[91,92] Research indicated up to 50% of methamphetamine users had trouble containing their violent impulses when high on methamphetamine.[93] When high, the user may experience an extreme degree of mistrust of others. This can increase the tendency for violence and may result in homicidal acts.[94]

Users of methamphetamine can also experience “formication” or the feeling of bugs crawling on or under the skin. This is the result of the capillary veins shrinking and atrophying (wasting away), and it causes severe itching. To rid themselves of these “bugs” or the itch, users will scratch themselves excessively, often with the result of creating open sores on their bodies.[95] Other skin lesions can result from injecting methamphetamine, as well as from chemical burns that result from cooking methamphetamine, or cellulitis (inflammation of skin tissue) from failure to care for wounds. Methamphetamine use also results in acne. One of the more visible symptoms of methamphetamine use is the significant change in the physical appearance in users as constricted blood vessels prevent the flow of blood to various parts of the body. This can cause tissues to become damaged and result in the skin losing its luster and elasticity. The physical appearance of methamphetamine users can change quickly and many users appear to be decades older than they actually are. Users also appear gaunt and frail as binging on methamphetamine often results in excessive physical movement with a corresponding lack of food.[96]

Also common in methamphetamine users is “meth mouth”. Meth mouth involves damaged and discoloured teeth produced by the combination of a dry mouth, heavy sugar intake, excessive grinding of teeth due to an overstimulated nervous system, and poor dental hygiene.[97] Methamphetamine causes salivary glands to dry out, resulting in the acids in the mouth destroying the tooth enamel. Combined with constant teeth

grinding, these weakened teeth are likely to break or become otherwise damaged. Tooth decay may also be the result of the corrosive nature of the drug itself as it is produced from the combination of several corrosive chemicals, such as lithium and ammonia. It has been reported that methamphetamine use in America has resulted in increased dental costs for the department of corrections. For instance, the Minnesota Department of Corrections reported that dental costs for inmates had doubled in the past five years primarily because of the extensive dental work required by methamphetamine addicted inmates.[98]

Methamphetamine use can also lead to death due to pulmonary edema, cerebral hemorrhage, or congestive heart failure. The user's greater propensity to engage in violent behaviour against themselves or others also increases the risk of death occurring. Becoming involved in the production of methamphetamine also increases one's risk of physical harm from the explosion of meth labs, short and long term exposure to dangerous chemicals, or violence from gangs and other drug users, producers, and distributors.[99, 100] Moreover, high doses of methamphetamine can result in symptoms similar to schizophrenia; users may exhibit psychomotor agitation (e.g. athetosis, or writhing, jerky, flailing movements), grandiosity, formication, manic or hypomanic episodes, or repeated behaviours, such as the disassembling and reassembling of things.[101, 102]

Long-Term Effects

The long-term effects of methamphetamine abuse are devastating. Abusers may experience symptoms for many years following their last use of methamphetamine. For instance, they may become depressed, exhibit psychotic tendencies, such as hypersensitivity to the environment, paranoid ideation, hallucinations and delusions, develop paranoia, become irritable, become violent towards themselves or others, experience sudden mood changes, or engage in repetitive behaviours.[103,104] Chronic use of methamphetamine can result in serious long-term outcomes, such as symptoms similar to Parkinson's disease (severe movement disorders).[105]

Symptoms of psychosis can last for months or years after abuse of methamphetamine has ended. Symptoms may also re-appear after a period of time. For instance, stress has resulted in methamphetamine psychosis recurring in formerly psychotic methamphetamine abusers.[106] At risk of developing methamphetamine psychosis are those who begin using methamphetamine at a young age, those who use large amounts, those who are predisposed to either schizoid or schizotypal characteristics, or those who have a genetic risk.[107] Methamphetamine psychosis can develop to the point where it can occur even in the absence of methamphetamine use by the user.

Methamphetamine users are also commonly at risk of contracting sexually transmitted diseases, such as HIV and AIDS (Acquired Immune Deficiency Syndrome). Methamphetamine increases sexual libido while decreasing inhibitions and judgment. Thus, users of methamphetamine often engage in high-risk behaviours, such as unprotected sex, multiple sexual partners, and anonymous sexual partners.[108] However, chronic use of methamphetamine can also result in a reduction of the sex drive and impotence. This has lead some methamphetamine users to combine

methamphetamine with drugs like Viagra.[109, 110]

As a methamphetamine user comes down from their methamphetamine-induced high, they go through a period known as "tweaking", where they experience anxiety and restlessness, irritability, fatigue, and dysphoria (a state of unease or dissatisfaction). Reports suggest that tweaking is the most dangerous stage of methamphetamine use for both the users and front-line personnel, such as law enforcement and medical workers. Recommendations for responding to a methamphetamine user during this stage include staying at least three arms-lengths away, speaking slowly and softly, moving slowly, slowing bodily actions, keeping hands visible, and keeping the person talking.[111] These protective behaviours will decrease the chance that the user will experience an episode of violence or psychosis.

To reduce "tweaking" symptoms, users will often ingest more methamphetamine which provides them some temporary relief. However, this also serves to reinforce their addiction to the drug, creating a dangerous cycle of repeated use.[112] As noted above, methamphetamine is a highly addictive drug. Given this, withdrawal is extremely difficult. While undergoing withdrawal or the "crash" period, the effects of methamphetamine use are often reversed. During this period, users may experience depression, increased appetite, irritability, melancholia, and general apathy.[113, 114] They experience high rates of fatigue and may sleep for lengthy periods of time. If the user has children, they may administer antihistamines and benzodiazepines to their children to keep them asleep while they get through the crash.[115] The withdrawal and early abstinence periods are associated most often with depression, but also with irritability and suicidal ideation.[116]

As mentioned above, there is a correlation between methamphetamine addiction and criminal activities, primarily as a method to support the habit. For instance, in order to obtain the materials needed for methamphetamine production, users may resort to theft of cash or of the ingredients and materials. In rural areas, where it is common to find tanks of anhydrous ammonia, thieves have been known to siphon off the ammonia or to steal the tanks. Attempts to gain access to cash for materials may involve robbery. In contrast, attempts to gain access to materials restricted to a small group of people (e.g. pharmacists) may result in identity theft.[117] This range of behaviour contributes to the finding that methamphetamine users and producers (often one and the same) commonly come into contact with the criminal justice system. As an illustration of this fact, in 2002, the American criminal justice system referred over half of the clients admitted for methamphetamine treatment.[118]

Withdrawal Process

Soon after a user stops using methamphetamine, they go through a period of withdrawal. The criteria to diagnose withdrawal from amphetamines are essentially the same as the criteria for cocaine. In both cases, to diagnose withdrawal using the Diagnostic and Statistical Manual of Mental Disorders (a diagnostic reference tool), an individual must display a dysphoric mood, as well as two of either: fatigue, vivid and unpleasant dreams, insomnia or hypersomnia (excessive sleep), increased appetite, or psychomotor (mental

and physical responses) agitation or retardation.

Despite similarities between the diagnosis of cocaine and amphetamine withdrawal, withdrawal symptoms from methamphetamine use appear to be twice as intense as cocaine withdrawal symptoms, especially during the first few days of abstinence from the drug.[119] Withdrawal from methamphetamine abuse or dependence is often characterized by depressive symptoms, such as a lack of pleasure or interest in things, a lack of energy, irritability, and poor concentration.[120] The depressive symptoms experienced by current or past users of amphetamine appear to occur more often than in users of other psychostimulant drugs, such as cocaine. Amphetamine users' depressive symptoms also appear to persist longer than the depressive symptoms of users of other drugs.[121]

In addition to depressive symptoms, methamphetamine users present a wide range of additional psychosocial symptoms. In a recent study, nearly half (46 per cent) of methamphetamine users entering in-patient treatment reported previously diagnosed psychological problems; for nearly one third of these cases (30 per cent), admission to a psychiatric hospital was necessary. Similarly, in a group of over 1,000 methamphetamine-dependent treatment clients, an extensive range of psychiatric symptoms, including depression, attempted suicide, anxiety, psychotic symptoms, anger control problems, and violent behaviour were observed. Within this group, slightly more than one quarter (26 per cent) of the treatment clients reported that their symptoms were severe enough to need psychiatric hospitalization. In addition, nearly one third (32 per cent) were prescribed psychiatric medication.[122]

Research indicates that three distinguishable symptom groups appear during the withdrawal process: (1)hyper-arousal; (2) reversed vegetative symptoms; and (3) anxiety-related symptoms. Symptoms of hyper-arousal include cravings for methamphetamine, states of agitation, and/or vivid and unpleasant dreams. Reversed vegetative symptoms are indicated by a lack of energy, increased appetite, and a craving for sleep. The anxiety-related symptoms typically involve anxiety itself, slowing of movements, and loss of pleasure or interest in things. These symptoms are experienced acutely for one to two days following last use of methamphetamine and subsequently reduce over a period of approximately ten days. However, it appears that some symptoms, such as irritability, moodiness, sleeping difficulties, and cognitive deficits, may continue to be experienced for several months following methamphetamine use.[123]

The initial stages of withdrawal from amphetamines can be grouped into two main stages. The first stage, acute recovery, involves an increase in sleeping and eating, depressive symptoms (inactivity, fatigue, dysphoria, lack of pleasure or interest), anxiety symptoms, and experiences of craving. Also experienced, although to a less significant degree, are agitation, vivid dreams, poor concentration, irritability, and tension. The intensity of these experiences quickly reaches a peak (i.e. within one to two days following the last use of amphetamines) and continues to decline over the subsequent seven to ten days. At this point, the user will enter the second stage of withdrawal, the subacute level, in which many of these symptoms are still present, but are experienced at a lower level of intensity. Throughout this process, users will continue to experience sleep and appetite-related

symptoms. The evidence pertaining to sleep-related symptoms of amphetamine withdrawal is somewhat inconsistent. Some research suggests that the initial "crash" period, where the user will sleep excessively, is followed by a period of insomnia. However, other research suggests that, following the acute phase of withdrawal, insomnia does not occur, but that sleep is of poor quality. In other words, while the user will sleep for up to nine hours a night, their sleep is characterized by multiple awakenings and it will take them longer to fall asleep initially.[124]

Users of Amphetamines – Characteristics and Motivations

As discussed above, amphetamines are used by a wide range of people, such as students, truck drivers, other drug users, and employees; essentially, amphetamine use knows no socio-economic boundaries. There are various reasons why people choose to use methamphetamine. For instance, many report using methamphetamine to increase their energy and performance levels. Others use methamphetamine to enhance their social interaction or their sexual activities. Some of those with medical conditions, such as asthma or hyperactivity, report using methamphetamine for its calming effect.[125]

One study with adult methamphetamine treatment seekers in Los Angeles provided an excellent profile of methamphetamine users. These users spent, on average, nine years between their initial use of methamphetamine and their first admission to treatment. After their first treatment for methamphetamine use, over half of the sample (58 per cent) relapsed into methamphetamine use within six months. The longest period of continuous daily use in this sample was, on average, 212 days. Moreover, methamphetamine was used frequently, at an average rate of nearly 10 times a day. The average age of first use of methamphetamine was just under 19 years old. Study results indicated that there was typically a rapid escalation from initial use to regular use of methamphetamine. Most of the sample had a criminal history; 94% had been arrested before and 51% had been arrested more than five times.

Within this group of methamphetamine users, females reported being introduced to methamphetamine primarily through their spouse, boyfriend, or girlfriend, while men were more often introduced through friends. Overall, more than half of the sample (59 per cent) was introduced to methamphetamine by a friend, 13% were introduced by their spouse, boyfriend, or girlfriend, 3% were introduced by their parents, an additional 12% were introduced by another family member, 3% were introduced by a co-worker, and 3% were introduced by a drug dealer.

The multi-problem profiles of these men and women, as a result of methamphetamine use, were extremely serious. These problems included: weight loss (84 per cent); sleeplessness (78 per cent); financial problems (73 per cent); paranoia (67 per cent); legal problems (63 per cent); hallucinations (61 per cent); work-related problems (60 per cent); violent behaviour (57 per cent); dental problems (55 per cent); skin problems (36 per cent); and high blood pressure (24 per cent). As men reported that they were more likely to be motivated to use methamphetamine to increase their ability to work, men were also much more likely to report work related problems (70 per cent) than women (48 per cent). Thus, while use of methamphetamine may have initially increased their productivity, in the long run,

use of methamphetamine had substantial negative consequences.

These treatment clients also reported how they got methamphetamine. Most of the sample (85 per cent) received the drug without paying for it directly. In effect, 81% of this group got their methamphetamine for free, while 61% traded something, such as sex, for it. Nearly two thirds (61 per cent) also reported that their dealer had given them methamphetamine, while nearly one third (30 per cent) reported dealing it themselves. A smaller proportion of the sample (18 per cent) admitted to stealing methamphetamine, while 13% cooked it themselves. Of those who reported cooking methamphetamine, most often this occurred in another person's house (57 per cent). Other locations for cooking methamphetamine included: a motel room (37 per cent); a motor vehicle (37 per cent); their own house (30 per cent); outdoors (26 per cent); or in a storage unit (20 per cent). Most of those who cooked methamphetamine themselves indicated that getting the chemicals and materials needed to produce methamphetamine was easy.

In this study, the most common reason identified for using methamphetamine was simply to get high (59 per cent). Other common reasons included: to have fun (45 per cent); to increase energy (44 per cent); to experiment (41 per cent); because friends used it (45 per cent); to stay awake (34 per cent); to escape psychologically (24 per cent); to improve sex (19 per cent); to lose weight (19 per cent); and to be able to work more hours (15 per cent). In particular, females were far more likely to report using methamphetamine to lose weight (36 per cent) than males (7 per cent). In addition, females were also more likely to use methamphetamine to increase energy than males, while males were more likely to identify the ability to work more hours as their primary reason for using methamphetamine, reflecting the common misconception of methamphetamine as a functional drug.[126]

These various motivations for methamphetamine use reflect the range of subsequent treatment approaches that should be individualized depending on each person's reasons for use. For instance, women are more likely to report using methamphetamine in order to lose weight; however, during treatment, weight may be re-gained. Therefore, treatment approaches should take into consideration the specific reasons for why an individual uses methamphetamine, as knowledge of weight loss, for example, as a primary motivator for methamphetamine use, requires treatment to address managing and controlling weight during abstinence. Similarly, a number of users reported using methamphetamine to improve their sexual experiences. Treatment should address this issue and attempt to help the client learn that enhanced sexual experiences are not dependent on the use of methamphetamine. Thus, awareness of the motivations for use will assist those administering treatment programs. In addition, such knowledge may help prevent the initiation of methamphetamine use. For instance, as females identify weight loss as a common motivator and males identify the ability to work more hours as a common motivator, prevention efforts for females and males may respectively focus on the excessive weight loss experienced by many users and the decreased productivity and work-related problems commonly experienced by users.

A recent survey conducted in Vancouver in the summer of 2006 asked over 600 youth

between the ages of 16 and 25 years old about their use of drugs, including crystal methamphetamine. Approximately 20% of the sample reported being offered crystal methamphetamine at least once in the previous 12 months, and nearly half agreed that it was an easy drug to obtain. Although not identified as a "mainstream drug", overall, 11.8% of youth had tried crystal methamphetamine at least once. Trying crystal methamphetamine was much more common among the older youth in this sample. Specifically, slightly more than 16% of 19 to 25 year olds reported that they had tried crystal methamphetamine compared to 5% of 16 to 18 year olds. Although many of these youth reported infrequent use of methamphetamine, they also reported that once they started using drugs, such as crystal methamphetamine, it was difficult to reduce and/or stop their use.[127]

Despite the potential for both short and long-term damage from methamphetamine use, the use of the drug is still very popular, especially among street-youth, gay men, and youth involved in the party/club/rave scene. The continuing popularity of methamphetamine is likely due to its relative low cost and its ability to produce a lengthy state of euphoria. The following section will discuss the use of methamphetamine in several populations who are particularly at-risk for use.

Special Populations

Many reports indicate that users of methamphetamine tend to be Caucasian, between 20 to 29 years old, with the second highest rates of use among 14 to 19 year olds.[128, 129, 130] Research also suggests differing reasons for use of methamphetamine by females and males. For instance, as mentioned above, females report using methamphetamine to escape or deal with their emotional problems, to deal with family problems, to increase productivity, to lose weight, and to improve strength. In contrast, males more often report using methamphetamine to be more productive, because their parents also used drugs, or for curiosity. Males and females were equally likely to report using methamphetamine because it was easy to obtain.

Users are often introduced to methamphetamine at an earlier age than other drugs, such as cocaine. Data from the Substance Abuse and Mental Health Services Administration Treatment Episode Data Set in 1999 indicated that 36% of users were first introduced to methamphetamine before they were 16 years old.[131]

Amphetamine use is particularly popular among certain groups of people. For instance, the use of crystal methamphetamine is a common drug of choice for several groups of youth, such as street youth, rave or club-going youth, transgendered youth, or those with an alternative sexual orientation. Methamphetamine is also a popular drug for teenage girls who use it for weight control.

The Party Scene

Both ecstasy and methamphetamine have been found to be popular drugs used by youth at rave dances or night clubs. Over 1,700 samples of ecstasy and methamphetamine confiscated by the Royal Canadian Mounted Police from youth attending these party scenes have been analyzed by police drug labs. The results showed that, in the majority of cases, ecstasy tablets were not pure ecstasy, but also contained traces of other drugs, such as methamphetamine. [132]

Although many youth knowingly combine ecstasy and methamphetamine, a term known as "flipping", some users are introduced to methamphetamine without their knowledge by consuming ecstasy; according to police data, ecstasy tablets commonly include methamphetamine as an ingredient. For instance, in Alberta, an estimated 70% to 75% of ecstasy tablets sold on the street contain methamphetamine.[133]

Street Youth

The use of amphetamines, such as crystal methamphetamine, has increased over the past decade, particularly among certain at-risk populations, such as street youth. Likely reasons for use of crystal methamphetamine among this population include the ability of the drug to stave off hunger and the need for sleep. In addition, crystal methamphetamine is cheap and easily available, making it an attractive alternative to youth who live on the street.

In 2001, the McCreary Centre in British Columbia surveyed street youth and concluded that 71% had used amphetamines. Agencies, such as the Fraser Health Addiction Services, have documented increases in the rates of crystal methamphetamine use. In 2003 to 2004, the Fraser Health Addiction Services admitted 1,200 youth, 30% of whom had used crystal methamphetamine.[134] A 2000 study with street youth between the ages of 14 and 30 years old identified high rates of methamphetamine use. This study reported that 71% of their sample had tried amphetamines and over half (57 per cent) reported using amphetamines more than 10 times.[135] Pacific Community Resources in 2002 surveyed 1,936 youth ages 12 to 24 years old in the Lower Mainland. Of this sample, 18.7% reported that they had tried crystal methamphetamine (7 to 8 per cent within the past month).[136] Their survey identified the average age of first use of crystal methamphetamine as 14.5 years old. The 2003 Methamphetamine Study of Youth (MASY) surveyed 126 street involved youth in Vancouver and Victoria and identified high rates (67 per cent) of lifetime crystal methamphetamine use. Nearly half of the street-involved youth (43.5 per cent) reported using crystal methamphetamine within the past week. The street involved youth who reported active use of crystal methamphetamine were also more likely to report use of cigarettes, marijuana, heroin, ecstasy, and/or ketamine within the previous two weeks. These youth were also more likely to experience a range of negative consequences, such as imprisonment, testing positive for hepatitis C, and having auditory hallucinations. For the street involved youth in this study, a specific risk factor for crystal methamphetamine use was self-identifying as a sexual minority.[137]

Minority Sexual Orientation

Youth with a minority sexual orientation, such as identifying as gay, lesbian, bisexual, transgender, or queer, have also been identified as a sub-population within which crystal methamphetamine use is relatively high. Some research has even identified methamphetamine as the drug of choice for gay or bisexual men.[138] The 2003 MASY with youth in Vancouver and Victoria concluded that crystal methamphetamine use was a relatively frequent occurrence within this population. Approximately one quarter (24 per cent) of the 54 youth surveyed identified lifetime crystal methamphetamine use and more than half (57 per cent) indicated that they used crystal methamphetamine multiple times a day, nearly half (42.9 per cent) of

whom admitted to using within the past week.[139]

Additional research in Vancouver, British Columbia with men who have sex with men (MSM) revealed that crystal methamphetamine use was popular due to its effects of wakefulness and increased energy. However, this group of men identified crystal methamphetamine as a highly addictive and problematic drug. Still, crystal methamphetamine was identified with sexual activity, unprotected, and anonymous (sometimes group) sex. Men who were HIV-positive were also found to more likely use crystal methamphetamine regularly. The use of crystal methamphetamine was compared to the use of ecstasy and, while both were found to be used in social situations, such as dance parties, celebrating holidays, or events like the Gay Pride festival and Halloween, crystal methamphetamine was more related to risky sexual behaviours.[140] The 2004 Sex Now survey identified that a quarter of gay men in British Columbia reported using methamphetamine.[141]

Reports such as these suggest that methamphetamine abuse likely contributes towards the spread of HIV in the gay male population. Methamphetamine increases libido and reduces inhibitions which may result in high-risk sexual behaviours, such as unprotected anal sex, multiple sexual partners, an increased likelihood of engaging in sexual marathons, and a tendency to engage in anonymous sexual encounters. High rates of unprotected anal sex are found within HIV-positive populations who participate in methamphetamine-fueled homosexual activity, thereby contributing to the spread of HIV within this population. Methamphetamine use is also related to delayed ejaculation and having rough sex. Even if safe sex is practiced, for example through the use of a condom, having rough sex for a prolonged period of time may result in the condom breaking or tearing, thereby increasing the risk of HIV infection.[142]

Prison Populations

Drug addiction is common within prisons and methamphetamine is no exception. Research in Canadian federal prisons suggested that nearly 80% of offenders had an identifiable alcohol or drug problem when they entered prison.[143] Other research indicated that about one-fifth of offenders who used drugs or alcohol had a dependence problem, while the remainder exhibited either non-problematic use or low severity problems.[144] Nearly one-quarter of offenders were in prison for drug-related offences, such as dealing or committing crimes to obtain alcohol and/or drugs. Many offenders were also under the influence of substances when they committed their offence. Use of drugs and alcohol within prisons is common, resulting in increased levels of violence and threatening the health of inmates and staff.[145]

There is a large body of research in Canada and the United States that supports the relationship between methamphetamine and criminal behaviour. Research in 1999, in Spokane County, Washington, concluded that 20% of new prison inmates tested positive for methamphetamine. This rate was higher than the rate for any other hard drug.[146] In Iowa, in 1999, 14% of those arrested for a crime tested positive for methamphetamine.[147] Many inmates entering the prison system have problems with drug addiction. Although many of these problems are characterized by poly-substance abuse, for a large proportion of these offenders, methamphetamine may be the primary

addiction. Given that withdrawal from methamphetamine can be a taxing process that often results in psychotic and/or violent outbursts, the prevention of harm caused by methamphetamine addicted inmates to other inmates or staff is paramount. Therefore, it is essential that inmates be screened for the presence of methamphetamine in order to allow prison staff to be aware of what behaviours or psychological states may be likely. In addition, early access to treatment is extremely important.

Prisons offer an opportunity to provide treatment for those addicted to drugs such as methamphetamine. Treating offenders for drug addiction can have the added benefit of improving public safety. Evaluation of previous treatment models employed in Canadian prisons supports the importance of post-release care. Research with program participants indicated that those who participated in community aftercare had a 56% reduction in reconvictions.

The Canadian national substance abuse program (NSAP) has three levels of treatment ranging from low-intensity to high-intensity. The frequency of participation in institutional and community components of this treatment model depend on the needs of the particular inmate. During treatment, the link between crime and substance abuse is focused on, and offenders work towards the development of a relapse and recidivism prevention plan. The program emphasizes improvement in four key areas of life: (1) better relationships; (2) feeling good; (3) satisfying life; and (4) personal control and freedom. There are four phases to each program consisting of: "Deciding What I Would Like to Change"; "Improving the Odds: Understanding and Learning How to Manage Risk"; "Learning the Tools for Change"; and "Using the Skills and Planning for my Future".[148]

Not all offenders who use methamphetamine may be incarcerated. In fact, many may be sentenced to probation to serve their sentence in the community.

Methamphetamine abusing offenders may be able to access community services that will help them to enter treatment programs. Methamphetamine abusers often have a difficult time not only entering treatment, but staying there for a sufficient period of time. Therefore, offenders released into the community must be encouraged to seek and participate in treatment. As will be discussed further in this review, in order to encourage this practice, drug courts are becoming more commonly used across North America. Essentially, drug courts involve the use of contingencies to promote abstinence from drug use. In effect, collaboration and sharing of information between various criminal justice agencies can improve the likelihood that offenders receive treatment for recognized methamphetamine use problems, for instance, by diverting offenders to a drug court system.[149]

Indications of Methamphetamine Use

When a person uses methamphetamine, they typically have a lot of energy and may engage in repetitive actions, such as cleaning or vacuuming. They may also exhibit psychological disturbances, such as anxiety, paranoia, irritability, confusion, psychosis, and mood swings. These states increase the potential for violent behaviours. Additional indications of use include dilated pupils, lack of appetite, or lack of need for sleep. It is also possible for either the user or for those

exposed to methamphetamine production to emit the smell of stale urine stemming from the inclusion of ammonia as an ingredient of methamphetamine. Consistent use of methamphetamine can lead to abscesses on the skin, dramatic weight loss, poor hygiene, and dental problems.[150] Chronic use of methamphetamine is often reflected in poor school or job performance. Chronic users may also have problems in their relationships with others.[151]

Production of Methamphetamine

Methamphetamine is a synthetic drug, meaning that it is man-made, as opposed to naturally occurring. The production of methamphetamine, known as ephedrine or pseudoephedrine reduction, is a relatively easy and inexpensive, yet highly dangerous, process.[152,153] Taking between six to eight hours, the production involves the combination of various chemicals, including ephedrine or pseudoephedrine, red phosphorous, ammonia, acetone, rubbing or isopropyl alcohol, methanol, lithium, lye, and iodine, which can be found in a wide range of typical household products, such as drain cleaner, batteries, paint thinner, matchbooks, cold pills, and engine starters.[154, 155, 156] The components necessary to set up a methamphetamine lab can fit in a small box, car trunk, or suitcase and, therefore, labs are easily transportable.[157,158] Although methamphetamine can be produced virtually anywhere, rural areas are especially vulnerable for several reasons.[159] The relative isolation offered by rural areas facilitates the set up of methamphetamine labs and the dispersal of odours. In addition, in rural areas, it can be quite common to find anhydrous ammonia tanks used in farming and, therefore, access to raw materials is facilitated either through the siphoning off of ammonia or the theft of tanks.[160]

The production of methamphetamine is dangerous for several reasons. Methamphetamine production involves the combination of various chemicals and heavy metals that are toxic, corrosive, and flammable. The combination of these ingredients being cooked together presents a substantial danger for fire or explosion.[161] The production of methamphetamine is resulting in increased costs to the health care system due to the physical damage that occurs when a methamphetamine lab explodes. For instance, in the United States, the treatment costs of 20 hospitalized burn patients associated with methamphetamine production averaged $77,580 dollars. Serious medical interventions were needed for most of the patients, with one patient dying, six requiring ventilation assistance for an average of 20 days, and over half needing operations (two of which were for reconstructive purposes). One third of this group also developed further complications, such as pneumonia or cellulitis. These patients present additional risks to hospital staff as they are quite often violent and often in need of detoxification.[162]

The cooking of various chemicals produces toxic fumes that are released into the air. These fumes can be absorbed into the body, resulting in the burning of or damage to the eyes and skin, dry mouth, anorexia, insomnia, tremors, rashes, fainting, blurred vision, impotence, headaches, nausea, dizziness, seizures, cardiac distress, such as chest pain, and/or respiratory distress, such as coughing or shortness of breath.[163,164] Long-term effects of exposure to these fumes are unknown, but reports suggest severe skin conditions, insomnia, irritability, poor concentration,

hyperactivity, personality changes, weight loss, ulcers on the lips and tongues, anxiety, fear, hallucinations, symptoms of schizophrenia, kidney, lung, and liver diseases, as well as various cancers are all possible outcomes.[165,166,167] An additional concern regarding production of methamphetamine in home labs is the lack of quality control over the product. Those producing methamphetamine are infrequently trained chemists and, as a result, the potential for contamination of the end product is enhanced, thus increasing the risk of harm suffered by those using the drug.[168] Similarly, their general inexperience with combining flammable chemicals and their impaired judgment as a result of methamphetamine induced intoxication increases the risk for fire and/or explosion, one of the most common reasons methamphetamine labs are discovered.[169]

> ***To make meth, all you need is a pinch of red phosphorous, a smidgen of ephedrine, a dash of iodine, and a bit of lye. Add some distilled water and simmer for a few hours. Nearly 40% of these labs are discovered by way of a fire or explosion, resulting in significant threats to both first responders such as police, firefighters, and paramedics, as well as to the community in general.***
>
> **Len Garis, Fire Chief, Surrey, British Columbia Fire Department**

The ingredients of methamphetamine range from ammonia and phosphorous to lithium and acid (see Appendix A). These chemicals, which are also used in items such as gasoline, nailpolish remover, drain cleaner, antifreeze, and battery acid, are often highly toxic and corrosive. The chemicals used in methamphetamine production can be extracted from typical household items, such as lithium batteries (e.g. in cameras), matches, and hydrogen peroxide.[170] The chemicals are often extremely hazardous. For instance, iodine crystals irritate the eyes, causes respiratory problems, and can burn the skin. If ingested, they can cause severe internal damage. Red phosphorous is a chemical that can explode on contact or with friction and will ignite when heated above a certain temperature. Red phosphorous vapours can irritate the eyes, lungs, nose, and throat. Lithium metal increases the risk for explosion or fire, and it reacts violently with water. Lithium metal is also caustic to the skin.

The ingredients for methamphetamine are often easily available. Some are over-the-counter medications, while others are available in hardware, convenience, or farming stores. While the sale of some ingredients, such as medications including ephedrine or pseudoephedrine, have recently been restricted in Canada through the passing of legislation, other chemicals are still widely available. When producing methamphetamine, cooks may add flammable household products, such as kerosene, gasoline, rubbing alcohol, paint thinner, lighter fluid, and mineral spirits. They may also add additional corrosive ingredients, such as sulfuric acid and hydrogen peroxide taken from lye-based drain cleaners.[171] If the cook cannot get access to certain chemicals, they may attempt to create them through the dangerous combination of other chemical ingredients. For instance, when a cook cannot get access to red phosphorous, they may

create hypophosphoric acid which is extremely dangerous due to high levels of toxicity in the phosphine gas produced.[172]

The production of methamphetamine involves the chemical reduction of products, such as cold medications, to extract ephedrine. Common production methods include the extraction of ephedrine, the creation of hydroiodic acid (combining water and iodine), and the mixing of both with red phosphorus.[173] Similarly, the "Birch Reduction" method uses a combination of anhydrous ammonia, lithium, and hydrogen chloride gas to produce a usable form of methamphetamine. Two of the most common methods used in the United States are the "Red-P" and the "Nazi" processes. The Red-P is named for its key ingredients of red phosphorous and iodine, while the Nazi process involves anhydrous ammonia. The Nazi process is more popular in rural areas where anhydrous ammonia is more readily available. A third, less common method, called P-2-P, includes lead acetate and mercuric chloride as its main ingredients.[174]

It has been estimated that in the production of a pound of methamphetamine, up to five to six pounds of toxic waste is produced, consisting of acid, lye, and phosphorus.[175] Often, this toxic waste is either left at the production area or dumped outside, risking chemical contamination.[176] Communities can, therefore, be threatened by contaminated water sources, such as when toxic waste is dumped into or near rivers or wells or the food source is contaminated, for instance, when the toxic waste contaminates livestock.[177]

The environmental costs of methamphetamine production are astounding. In 2001, methamphetamine's environmental impact was $5.5 million to the state of California in clean-up costs.[178] Several cities in British Columbia, such as Langley, are experiencing problems with the dumping of methamphetamine waste. Given that 80% of Langley Township is rural land, Langley has become an attractive place to both set up methamphetamine labs and to dump the resulting waste. Cleanup costs have been estimated to range between an average of $10,000 to $12,000 per dump, and, with an approximate rate of one dump discovered a month, taxpayers are paying over $120,000 a year for the cleanup of methamphetamine waste. The high costs are due mainly to the cost of legally disposing of the chemical waste. The dumped chemical waste tends to be left in sealed containers; however, there have been several incidents in Langley where the materials have been spilled, resulting in chemical contamination of the surrounding air and land. Local crews are not permitted to deal with these chemical dumps and, as a result, HazMat teams must be called in from Coquitlam where a company called CEDA Emergency Response is trained to deal with hazardous materials.[179]

Clandestine methamphetamine labs present other long-term threats to communities. Simply closing down a methamphetamine lab is not sufficient. The chemicals mixed and heated together produce toxic fumes that are often absorbed into the walls of the lab. Once a methamphetamine lab has been dismantled and the owners move on, unsuspecting families move into the location and may soon begin to notice a wide range of health effects ranging from asthma in their previously healthy children to parental fatigue and infection.[180]

Children are especially vulnerable to methamphetamine exposure. Many

clandestine methamphetamine house labs are operated by parents who live in the house with their children. For instance, in Washington State, children were found in approximately one-third (35 per cent) of the methamphetamine labs investigated.[181] During the production process, children are exposed to toxic fumes, commonly resulting in respiratory difficulties, such as asthma. Furthermore, as will be discussed in the upcoming Methamphetamine and Parenting section of this report, children are placed at risk for a variety of negative physical, emotional, psychological, and environmental outcomes ranging from neglect to physical and/or sexual abuse as a result of parental methamphetamine use or production.

There are several warning signs or indicators of clandestine methamphetamine production. Signs of home labs range from strong odours that are paint-, ether-, or rotten egg-like, the presence of chemical containers (for instance, drain cleaner, battery acid, acetone, antifreeze), and the presence of large amounts of cold medications containing ephedrine or pseudoephedrine. In the area surrounding the house, there may be evidence of chemical dumps (e.g. brown grass). Windows may be covered to increase the privacy of the house. There may also be evidence of red phosphorous, as this chemical may leave red or purple stains either on the floor or on the hands or faces of those producing methamphetamine. Materials used in the production of methamphetamine include glass cookware, hot plates, pop bottles, plastic tubing, kitty litter, and chemical flasks.[182]

Methamphetamine and Parenting

Parental Awareness of Methamphetamine Use

Recent studies indicated that parents were relatively unaware about the extent of methamphetamine use in their area and, more specifically, their own children's involvement with the drug. An American study in St. Louis, Missouri, indicated that, while a majority of parents (56 per cent) generally recognized methamphetamine as a national problem, a much smaller proportion of parents (20 per cent) acknowledged methamphetamine use as a local problem. Furthermore, despite the fact that in 2002 Missouri recorded the highest rate of methamphetamine lab seizures at 2,788 (the next closest being California with 1,769 and Washington with 1,409), three quarters of parents assumed that methamphetamine was not easily accessible to their children. However, surveys with 300 teenagers in this study indicated that 18% had been offered methamphetamine in the past and 3% reported using it.[183]

This survey also indicated that both parents and children were uninformed about the potentially serious health threats that methamphetamine use presented. Specifically, almost half of the 300 parents and nearly one-third of the teens did not believe that methamphetamine use could result in a stroke; 35% of both teens and parents failed to realize the potential risk for a heart attack. This suggests the need for greater education regarding the harmful effects of methamphetamine.

Methamphetamine Exposure to Children

While parents are often unaware of the extent to which methamphetamine is available to their children and the extent to which their children are using it, it is unfortunately not uncommon for parents to expose their own children to methamphetamine. Methamphetamine use by parents is an extreme health and safety concern across North America, in particular because parents using methamphetamine can manufacture the drug themselves in the home. A recent study in San Diego, California, examined the primary drug abused by slightly more than 6,000 mothers accessing the alcohol and other drug treatment services. Of these mothers who were also accessing child protective services, 60% identified methamphetamine as their primary drug of choice. Many of these mothers also made the drug themselves in their home, exposing their children to risk from toxins and chemicals and the possibility for chemical explosions.[184] Furthermore, methamphetamine use was common among females in their childbearing years, increasing the possibility that their children would be exposed to methamphetamine prior to birth.[185]

Methamphetamine Exposure in Utero

It is widely recognized that maternal use of substances, such as alcohol and nicotine, during pregnancy can result in developmental delays and behavioural and cognitive defects. As yet, the effects of maternal methamphetamine use during pregnancy is not as widely documented; however, it is clear that methamphetamine use by pregnant women exposes the fetus to a number of harmful toxins that can potentially

have long-term negative effects on the child's healthy development. Studies with animals have indicated that prenatal exposure to methamphetamine can result in increased mortality rates for the offspring and mother, as well as retinal eye defects, cleft palate, rib malformations, decreased rate of physical growth, and delayed motor development for the offspring.[186]

Despite limitations to conducting reliable studies on the exposure of methamphetamine to pregnant women, some studies have been able to provide new knowledge regarding methamphetamine use by pregnant mothers and the short and long-term effects on the developing child. For instance, studies have found that infants exposed to methamphetamine while in utero weighed less at birth, had an increased risk for premature birth, had a small head circumference, experienced cerebral infarctions (areas of dead tissue), increased heart rate and blood pressure, had a cleft palate, suffered a range of congenital abnormalities, and were at risk of intraventricular hemorrhage.[187, 188, 189] At one year of age, infants prenatally exposed to methamphetamine continued to be lethargic with poor eating and alertness. Studies with infants indicated poor visual recognition memory (associated with IQ), while behavioural outcomes included poor social adjustment and increased aggression.[190] Future development of thought disorders were also associated with children who experienced prenatal exposure to methamphetamine.[191]

A recent American study identified a small proportion (5.2 per cent) of new mothers who used methamphetamine while pregnant; 44% of whom engaged in polysubstance drug use. One-quarter of the sample smoked tobacco and a similar proportion (23 per cent) consumed alcohol during their pregnancy; however, nearly one in ten (11 per cent) used an illicit drug. In comparing their findings to the previous 1992 National Pregnancy and Health Survey, the authors identified that, while rates of alcohol, tobacco, and marijuana use remained relatively stable over the past decade, the rates of illicit drug use appeared to increase. This increase was attributed, in part, to methamphetamine. This study also identified several significant risk factors for substance use during pregnancy. For use of alcohol during pregnancy, risk factors included being Caucasian or Hispanic, as well as being unmarried. Risk factors for tobacco use included being Caucasian, being unmarried, having less than a high-school education, requiring public assistance, and having fewer than 11 prenatal visits. Finally, risk factors for illicit drug use also included being single, having less than a high-school education, requiring the use of public assistance, and having less than 11 prenatal visits.[192] Risk factors for methamphetamine use while pregnant were not specifically identified due to the relatively low base rate (5.2 per cent) of methamphetamine using mothers.

These studies have supported the effects suggested by animal research by documenting the occurrence of cleft palates and delayed growth and development in children of mothers who use substances while pregnant. In addition, studies with humans have found that maternal methamphetamine use while pregnant can result in childhood behavioural problems, cardiac dysfunctions, and cranial abnormalities.[193]

Parental Methamphetamine Use

Methamphetamine use by parents also has an effect on child welfare systems. For example, there is a burden on the system when a parent enters residential treatment and the child needs to be placed in a safe environment or when a person becomes concerned sufficiently regarding a child's welfare to place a call to child services. In Montana's fiscal year 2004, approximately 20% of child protection referrals were associated with methamphetamine use.[194] Of the 1,100 children in temporary state care in Spokane County, Washington, nearly half were due to their parents' involvement in methamphetamine.[195] In San Diego, between 1997 and 1999, 11,300 methamphetamine abusing women were admitted to alcohol or other drug treatment centers. Together, these women had nearly 17,000 children under the age of 18 years old.

Given the typically chaotic lifestyles of methamphetamine abusers, many of these children lack a sense of security and have challenges with trust and dependency.[196] In fact, the lives of methamphetamine abusers can be so chaotic that "*on any given day, children may not know when or if they will eat, where they will sleep, or what will happen from one hour to the next*"[197] Furthermore, it is likely for these children to be exposed to abuse and neglect as drug use is strongly correlated with impaired judgment and emotional instability, increasing the possibility that the children's physical and emotional needs will not be met by their parents.[198] Methamphetamine abuse by parents increases the risk of neglect for their children as "*the drug is so addictive, parents lose sight of everything else, including their children*".[199]

Clandestine methamphetamine labs found in the home threaten the children who live there, as well as the child welfare workers who conduct investigations stemming from complaints of child maltreatment. For instance, during routine investigations in which the child welfare worker visits the home, the worker is placed at risk of being contaminated by the toxins present in the house, in addition to the risk of an explosion resulting from the mixing of chemicals. The risk faced by the child welfare worker is increased when the investigation occurs in rural areas where the house may be isolated and the worker may lack an effective means of communication (i.e. there may not be cell phone service available). If a worker, during the course of their investigation, finds a clandestine methamphetamine lab in the house, they have limited options regarding how to respond. They may endanger themselves by entering the house or they may be forced to return at a later time with law enforcement officials and/or HazMat workers experienced in the takedown of methamphetamine labs. In addition, child welfare workers also risk being threatened by angry and paranoid methamphetamine abusing parents, a risk that is again increased when the worker is dealing with a house in a rural area that may be relatively isolated from others.[200]

As mentioned above, the increasing number of children requiring foster care as a result of parental use of methamphetamine places an extreme burden on social systems. In the United States, the number of children in care as a result of parental methamphetamine use has increased between 40% to 70%. A recent report on child welfare suggested that approximately one third (37 per cent) of all out of home child placements were the result of methamphetamine.[201] Many of these

children (many of whom have special needs as a result of methamphetamine exposure, parental neglect, etc…) are eventually placed in foster care. Compared to non-substance abusing mothers involved in the child welfare system, the likelihood of losing one's parental rights is increased for mothers with substance abuse issues.[202] This could be the result of the often lengthy recovery process from methamphetamine abuse, or the parent(s) may be incarcerated for a lengthy period of time as a result of their methamphetamine production. Either scenario may result in the child being placed in a foster care setting.[203] Although the goal of treatment is often to reunite these children with their families, the nature of methamphetamine addiction is so extreme that often permanent reunification is not possible.[204]

Brown and Hohman interviewed methamphetamine abusing parents assigned to drug treatment programs regarding the impact of methamphetamine on their parenting. They identified six primary themes: (1) polar parenting; (2) drug management; (3) the separate life; (4) domestic violence; (5) effects on children; and (6) retrospective ambivalence. They discovered that when parents were using methamphetamine, they tended to display emotional states characterized by extreme anger and apathy towards their children. In other words, parents would essentially ignore their children's behaviours and developmental milestones. The parents would also commonly isolate themselves from their children both in order to use methamphetamine and to escape from their children. At times, this behaviour would result in unsafe parenting practices where the children were left in the care of inappropriate caregivers (e.g. older siblings or drug abusing babysitters) or were abandoned in public areas for lengthy periods of time.[205]

The behaviours exhibited by these drug abusing parents left lasting effects on their children, who began to mimic their parent's behaviours. For example, these children would act violently or disrespectfully towards their parents. With their parents generally displaying apathy towards them, some children became involved in criminal behaviours. Their children were also placed at risk of being verbally or physically harmed when attempting to intervene in their parents' arguments and at least one parent reported that his children faced physical danger when another methamphetamine dealer broke into their apartment and physically assaulted their mother with the children watching. Furthermore, parents may become so focused on feeding their addiction that they become involved in criminal behaviour.[206]

In addition to these physical risks, children of methamphetamine abusers also experienced trauma resulting from dysfunctional environmental, psychological, and emotional events. Brown and Hohman discussed how, as parents cycled further into their methamphetamine addictions, it became a challenge to maintain safe and stable housing. As a result, many children moved frequently and inconsistently attended school. Some families were forced to live on the street due to their inability to pay rent. Their children took on more and more responsibility as the parent(s) became increasingly incapable of providing care for their family.[207] Some reports documented children as young as five or six years old caring for parents or younger siblings, cooking, cleaning, and ensuring the other children got to school on time. As an informant in another study said, children are

deprived of their childhood; they do not experience common childhood experiences, such as playing and other recreational activities, as they are too busy taking care of the rest of their family.[208]

The parents in the Brown and Hohman study also discussed how their children were psychologically affected by their parents' abandonment and neglect. For some parents, their children experienced separation anxiety; for others, their children outwardly expressed their experiences and anger through engagement in criminal activity and the abuse of others.[209]

Children exposed to methamphetamine abuse, like other children, learn behaviours and lifestyles directly and indirectly from their caregivers. Children of methamphetamine abusers may be taught to guard their communications or directly lie to child care workers, teachers, or police officers in order to protect the parents from being arrested. Some reports from the United States indicated that parents taught their children how to protect a methamphetamine lab using weapons, such as guns. Children were taught by parents to steal the ingredients needed to produce methamphetamine. Finally, in addition to allowing their children to observe frequent domestic violence and substance abuse, parents may introduce their children to gateway drugs or methamphetamine.[210]

As a result of their early learning experiences, these children face an increased risk of subsequent mental health and/or substance abuse disorders. Studies that track children for lengthy periods of time provide evidence of the long-term consequences that result from early exposure to drug-abusing lifestyles. Research with children raised in drug using homes supported the presence of an increased risk for early pregnancy, dropping out from school, and engaging in criminal and antisocial behaviours. Furthermore, studies indicated that child maltreatment, such as that experienced by children raised in chaotic methamphetamine abusing homes, was linked to future conduct problems, disruptive behavioural problems, attention problems, anxiety disorders, such as Post Traumatic Stress Disorder, and mood disorders. Children also exhibited a range of psychological problems, such as disturbed sleep, nightmares, flat affect, fear, grief, hopelessness, shame, and worry. Their emotional states may be disturbed, resulting in extreme emotional outbursts and meltdowns. They may express their feelings with externalizing antisocial behaviours, such as lying, delinquency, truancy, refusing to follow rules, or through acting disrespectfully. Extreme psychological pain and trauma may be reflected through cutting behaviours or other acts of self-mutilation, suicide, or the hoarding of items such as food.[211]

Lab Endangered Children

Parents or caregivers who manufacture methamphetamine at home place their child or children in danger. A recent estimate speculated that approximately one in four methamphetamine labs have children living at the location. A report from the National Clandestine Laboratory Database documented nearly 9,000 lab seizures in 2002, more than 90% of which involved the production of methamphetamine. Slightly more than 2,000 of these labs had children residing in them.[212] Similarly, over the span of two years (1997 to 1999), the state of California raided 176 methamphetamine house labs that had a total of 472 children residing in them. As a result of environmental

exposure, more than one-third of these children subsequently tested positive for the presence of illicit drugs.[213] Other reports indicated that the rate of pediatric deaths and emergency room visits for methamphetamine related burns and poisoning have increased.[214] Equally troubling, children are learning how to produce methamphetamine, as noted by Tammy Walker, a Program Manager with the Children's Advocacy Center in Athens, Tennessee:

"I have seen eight-year-olds who can tell you from beginning to end how to cook methamphetamine, what it looks like and how much it costs. They do not know what they're saying. They just know that methamphetamine is scary and they see their parents in trouble".[215]

When parents set up clandestine methamphetamine labs in their homes, their children are exposed to a wide array of toxins produced from the fumes of combining and cooking chemicals. Children are especially vulnerable to such contamination because babies will crawl on floors where chemicals may have been spilled, children cook their food in the same microwave that their caregivers cook methamphetamine, children may play and eat near open containers of toxic products, and children are exposed to the many harmful by-products of methamphetamine production, such as lead poisoning that is absorbed into their bones. Ingestion of toxic chemicals can result in poisoning, chemical burns, damaged organs, and developmental delays.[216,217] In 2001, 1,231 children found in methamphetamine house labs across California, Missouri, Oregon, and Washington required hospitalization or treatment as a result of toxic levels of methamphetamine ingredients and by-products in their bloodstreams.[218]

In addition to the consequences of chemical exposure, such as liver or kidney disease, cancers, anemia, or poisoning through ingestion of chemicals, children who live in homes with methamphetamine labs are also at risk for neglect. When parents are primarily focused on the production of methamphetamine, children can be forced to live in dilapidated houses that lack basic amenities, such as running water, safe electricity, food, and functional toilets. Short-term effects of living in such dysfunctional houses include the development of rashes, insect bites from flies and cockroaches that live in the house, poor dental care, malnutrition, and poor hygiene.[219] Reports from social workers referred to the accessibility of dirty needles, unchanged diapers, and a lack of food or formula for children and infants in houses with methamphetamine labs.[220] Weapons lying in easy reach of children are also often found in clandestine methamphetamine labs. Children may be at risk of being electrocuted from coming into contact with unprotected wires that result from their parents' unsafe electrical practices. Their parents may seal the windows shut in order to prevent the fumes escaping the house; a practice that increases the danger that children living in the house will inhale toxic fumes.[221]

Children living in such environments are also at increased risk of being physically and/or sexually abused.[222] Long-term effects in the form of speech and language deficiencies result from the general lack of stimulation necessary for a child's development. Children living with parents who use and/or produce methamphetamine are at risk for developing attachment disorders due to their tendency to be neglected and/or abused by their parents. Attachment disorders prevent children from forming close attachments with others,

leading to a lack of trust and increasing the subsequent risk of participation in criminal activities and substance abuse.[223]

Responding to Methamphetamine: Task Forces and Strategies

The number of clandestine labs discovered worldwide by law enforcement officials has been increasing.[224] Between 2001 and 2004, in Canada, the number of clandestine methamphetamine labs increased from 13 to 40; many of these were superlabs.[225] Similarly, across the United States, the number of labs seized increased significantly from nearly 2,000 in 1999 to over 13,000 in 2001; a substantial number of these were superlabs. Disturbingly, within many of these clandestine house labs, children have been found.

Information on clandestine drug labs in British Columbia was recently documented in a study of synthetic drug production operations. Researchers identified that 33 clandestine drug labs were uncovered by police during a two-year period between April 1, 2003 to March 31, 2005. Of these 33 labs, 27 (82 per cent) were specific to methamphetamine. In reviewing the police files of these cases, researchers documented that most of these labs were brought to the attention of the police through citizen reports made to Crime Stoppers, reports made by landlords, fire departments, or storage locker owners, through traffic stops, or during the investigation of other crimes. Only 23% of these labs were uncovered as a result of proactive police investigations.

The researchers further identified that most of these clandestine labs were located in rental properties, most commonly houses, apartments, and warehouses. Over half of the labs were categorized as "superlabs", capable of producing over five kilograms of methamphetamine in a single production cycle. Many of the labs were also found to have weapons present; firearms were found at 31% of the labs, whereas in 23% of the labs, other weapons such as knives were found. The police files documented further hazards to public safety, such as leaky chemical containers (found at 33 per cent of the labs) and burn hazards (characterizing 64 per cent of labs).[226]

Methamphetamine Lab Takedowns

Once a clandestine methamphetamine lab has been discovered, the takedown process is dangerous, lengthy, and costly. Due to the varying combination of chemicals on the scene, there is a high risk for explosion. In fact, 15% of methamphetamine labs are discovered as a result of an explosion or fire.[227] If the lab is located in a house or apartment, the area is often contaminated to the point where intensive clean up is necessary.

The takedown of methamphetamine labs is not only highly dangerous, but also extremely costly. As various chemicals are combined in the production of methamphetamine, teams involved in the takedown of methamphetamine labs are often required to have experience handling hazardous materials. As a result, the assistance of HazMat removal companies is often necessary when taking down methamphetamine labs. In the United States, at a cost of $5,000 a lab, the removal of methamphetamine labs is highly taxing. For instance, in 1995, the Bureau of Narcotics Enforcement spent $2.5 million on methamphetamine lab cleanups.[228] In Canada, methamphetamine lab clean-ups are estimated to cost between $30,000 to $150,000 per lab.[229]

Threats to Law Enforcement

Law enforcement officials frequently place themselves in harms way when responding to methamphetamine related incidences. For instance, methamphetamine users can often become paranoid, increasing the potential for violence to occur, especially if they perceive law enforcement officials as threatening. [230]

When responding to a methamphetamine lab, law enforcement officials are not only at risk of experiencing violence at the hands of a methamphetamine abuser, they also risk exposure to hazardous chemicals. When a clandestine methamphetamine lab is uncovered, the responsibility of taking down the lab typically falls to the police and/or fire officials and HazMat workers. The takedown of a methamphetamine lab is an extremely risky, time-consuming, expensive process. Upon entering a methamphetamine lab, responders are exposed to chemicals that contaminate the air, walls, floors, and furniture.[231] A fine methamphetamine residue may coat the walls and furniture.[232] Gases that may be present include hydrogen chloride, iodine, hydroiodic acid, naphthalene, and anhydrous ammonia. An additional chemical that responders may be exposed to is phosphine gas, a by-product of methamphetamine production that can occur when red phosphorous is heated near acids. Phosphine gas produces a fishy or garlicky odour. It has the potential to cause pulmonary toxicity when one is exposed to high levels. Phosphine gas has been the suspected cause of death of several methamphetamine cooks in the United States. Although first responders would typically be exposed to much less severe levels, exposure to phosphine gas can result in headaches, dry cough, dizziness, and diarrhea for days or months. It is, therefore, recommended that responders exit the lab if they smell a fishy or garlicky odour and report to the hospital if they suspect they have been exposed.[233]

Responders to the scene are also at risk of coming into contact with flammable and corrosive liquids. As a result of exposure to harmful chemicals and liquids, symptoms reported by primary responders to the scene of a methamphetamine lab include eye irritation, coughing, sore throat, dizziness, fatigue, nausea, and headaches.[234] Most commonly, symptoms of respiratory distress are reported.[235] It is, therefore, recommended that officials wear protective suits to insulate responders from chemical exposure. This suit should include a face mask to protect against the inhalation of vapours, chemical-resistant gloves and suits, and boot covers.

The methamphetamine lab will contain numerous airborne contaminants. The presence of uncontrolled chemical liquids and gases present a risk for explosion. Responders to the scene may find containers that are leaking chemicals, or pressure cylinders with chemicals that are corroding the cylinder valves. Dangerous chemicals may be stored in otherwise typical containers, such as milk jugs and pop bottles. The improper storage of chemicals increases the risk for contamination to occur and requires that only those who are licensed (e.g. HazMat workers) handle and transport the waste. In responding to methamphetamine labs, responders may also face dangerous booby traps, such as trip wires, hidden sticks with nails or spikes implanted, or the wiring of electrical appliances to explosive devices.[236] These booby traps are often set up by lab owners to protect the lab from invasion.

The main goal upon entering a clandestine methamphetamine lab is to carefully shut

down the cooking and begin ventilation of the area. Throughout the takedown, officials should continue to monitor the air quality and be attentive to indications of chemical waste dumps both inside and outside the property. When cooking methamphetamine, a large amount of hazardous waste is produced. This waste is often dumped by the cook down the drain or buried or burned outside. Indications of outdoor chemical dumps include dead grass, stained soil, and burned barrels or pits. The dumping of chemical waste can lead to contaminated drinking water and septic tanks. During the lab takedown, officials should monitor sewage systems to determine the presence of volatile chemicals. Officials should also look for stains, puddles, powders, residues, or wetness to determine the extent of the contamination. In addition, officials should swab walls, floors, ventilation systems, and furniture to assess the level of contamination.[237]

In evaluating the degree of contamination of the lab, there are few legislated guidelines. Several American states (Alaska, Arizona, Arkansas, Colorado, Minnesota, Tennessee, and Washington) have produced decontamination procedures that are specific to methamphetamine labs. However, national guidelines for taking down methamphetamine labs are lacking. Of further concern is the fact that many states, due to the excessive cost of methamphetamine lab cleanups, allow owners of methamphetamine contaminated properties to conduct the cleanup on their own. In addition to ventilation, cleanup of a methamphetamine lab includes removing items, such as carpets, that have been contaminated with methamphetamine (which often results in the release of more methamphetamine particles into the air), multiple washingd with detergents, and painting wood with polyurethane products. In some cases, the extent of damage to the property may be so excessive that there is no alternative but to assess the property as a total loss (common with trailer home methamphetamine labs) to be slated for demolition. The practice of self-performed contamination and the common failure to require property assessment for chemical contamination following self-performed cleanup can place future owners of the property at risk of contamination. Several recent cases have brought this concern to light as, in many areas, the lack of legally required disclosure that the property was a former methamphetamine lab has led to incidences of illness and the development of respiratory problems, such as asthma, in young children who have moved with their families, unknowingly, into a former methamphetamine lab.[238]

Legislation

A recent report by the United Nations International Narcotics Control Board[239] identified that restricting access to pre-cursor chemicals is the most effective method to reduce the trafficking of drugs. There are two international initiatives, Project Prism and Project Cohesion, that explicitly focused on the restriction of precursor chemicals used in the production of amphetamines, heroin, and cocaine. These initiatives attempted to restrict unauthorized transactions and/or diversions of precursor chemicals. Approaches such as pre-export notification systems allow for the rapid verification of transactions and the subsequent monitoring of thousands of transactions world-wide involving precursor chemicals.[240]

The ability of the public sector (e.g. criminal justice, child welfare) to respond to

methamphetamine use and abuse has also been bolstered by recent legislation in both the United States and Canada. In 2003, Canada passed legislation regulating the sale of precursor ingredients (ephedrine and pseudoephedrine) for methamphetamine. These regulations target the larger superlabs, as the legislation focuses on the sale of large quantities of precursor ingredients.[241] In 2005, the Canadian government amended the 2003 act to provide more strict controls over licensing procedures. In addition, the Canadian government also redefined methamphetamine to a more strictly controlled national drug schedule which increased the maximum penalties for trafficking and manufacturing methamphetamine from a maximum of 10 years imprisonment to life imprisonment. This change also had the effect of increasing the maximum sentence for possession of methamphetamine from three years in custody to seven years in prison.[242]

Various American states, such as Oklahoma, Iowa, and Oregon, have passed legislation restricting the sales of methamphetamine ingredients. These pieces of legislation stipulate that ingredients, such as products containing ephedrine, can only be sold in pharmacies as opposed to drug stores, convenience stores, gas stations, and grocery stores. In addition, the buyer must show identification and the number of boxes that one is allowed to purchase at one time is limited.[243] In 2006, the *Combat Methamphetamine Epidemic Act* was passed by the House of Representatives resulting in the introduction of tough anti-methamphetamine measures, such as a sale restriction on certain medicines including ephedrine, pseudoephedrine, and phenylpropanolamine, and increasing the penalties for traffickers of methamphetamine. In addition, the act provided funding for treatment programs specifically designed to be implemented with pregnant and parenting women who were using methamphetamine. The act also provided two separate sources of funding for assisting children who had been exposed to methamphetamine labs in their homes and to support drug courts.[244]

New Hampshire has independently introduced legislation that increased the penalties for methamphetamine related offences. The new law, signed on June 2, 2006, allowed for methamphetamine producers to be imprisoned for up to 30 years. Those convicted of repeat methamphetamine offences were liable to increased sentences. In addition, if prosecutors were able to prove intent to produce methamphetamine, possession of materials necessary for methamphetamine production, such as ephedrine, iodine, and anhydrous ammonia, would be a criminal act. Acknowledging the expenses that communities and governments incur in cleaning up after methamphetamine production, the new law also allowed for cleanup costs to be assessed against the convicted person.[245]

California has also taken steps to reduce the production of methamphetamine. For instance, the *Methamphetamine Contaminated Property Cleanup Act of 2005* required local health officers to determine who was responsible for the costs associated with the cleanup of methamphetamine-contaminated properties. Generally, property owners were liable for cleanup costs, even if the methamphetamine was produced by renters of their property.[246]

In the United States, the recent legislation limiting the ability to purchase large amounts

of pseudoephedrine needed for the production of methamphetamine resulted in a substantial reduction in the number of home labs producing methamphetamine. Iowa experienced a reduction of 80% to 90% in the number of home methamphetamine labs discovered. Across the state, from 2004 to 2005, methamphetamine lab discoveries fell from 119 a month to 20 a month.[247] Since that legislation was passed, it became much more difficult and expensive for methamphetamine producers to obtain the necessary materials to make the drug. As a result, some methamphetamine users resorted to filtering out methamphetamine from the urine of methamphetamine users, while others resorted to drinking the methamphetamine-tainted urine.[248]

Although useful in restricting access to precursor ingredients and therefore reducing the amount of methamphetamine produced, there are some limitations to this approach. Many of the logs used by pharmacies to record the identities of purchasers of ephedrine and pseudoephedrine are paper logs, rather than computerized logs. Therefore, there is no shared database available to cross-reference the names of interested purchasers of these ingredients. This practice may allow purchasers of ephedrine and pseudoephedrine to move easily between suppliers without being detected, as there is no efficient way to electronically track identification. In contrast, in Oklahoma, the state provides funding for a private company to collect and enter such information into a shared database, which is accessible to law enforcement. As a result, Oklahoma experienced an 80 per cent to 90 per cent reduction in methamphetamine labs.[249] Therefore, it is recommended that if a similar system of recording identification of purchasers of precursor ingredients is implemented, funding should be made available to facilitate the development of a centralized computerized system that is accessible to both law enforcement and precursor suppliers.

The production of methamphetamine shifted from the United States to Mexico in the early 1990s due, in part, to both law enforcement efforts against the motorcycle gangs who produced methamphetamine, as well as the rapid advancement of simpler methods of producing methamphetamine. Superlabs or facilities capable of producing up to ten pounds of methamphetamine in a single cycle have also recently become more popular in North America, particularly in the United States.[250] The recent legislation has been effective at curtailing the number of home methamphetamine labs; however, suppliers have again focused on importing methamphetamine from Mexico. While this kind of methamphetamine is more expensive than the home produced varieties, it is also typically more pure, which may result in increased rates of addiction and a higher potential for overdose. American law enforcement officials have recognized the presence of imported methamphetamine and have developed plans to work with Mexican and other international officials in reducing the trafficking of both methamphetamine and its precursor ingredients. These plans largely involve improving the development of international intelligence regarding the market for methamphetamine ingredients, improving border controls, strengthening law enforcement, and enforcing the *Combat Meth Act*'s restrictions on the selling of precursor chemical ingredients (i.e., those involving ephedrine or pseudoephedrine).[251]

Enforcement and Children

An important aspect of enforcement involves the children who are found living in methamphetamine labs. When children are involved, enforcement includes the legal responsibility to take action against parents who place their children in danger. Furthermore, when taking down a methamphetamine lab in which children are living, law enforcement officials must be aware of the needs of the children who are both physically and psychologically vulnerable during this process; not only are they witnessing police raid their house and arrest their parents, but they are also taken away from their home and placed in temporary or permanent care.[252] Losing one's home, parents, belongings, and possibly other family members (e.g. siblings) leaves children in an extremely vulnerable state that may have long term implications.[253]

Legislation

In recognition that some parents place their children at risk for toxin exposure and chemical explosions, California legislation in the late 1990s ruled that parents can be charged with felony child endangerment (Penal Code Section 273 (a)) for placing their children in situations that threaten their health or life. If a parent is caught manufacturing methamphetamine in the presence of children under the age of 16 years old and convicted under this legislation, the parent may receive a prison term of up to two years per child endangered. The state of New Hampshire recently introduced legislation stipulating that parents who exposed their children to methamphetamine could be penalized with up to five years in prison.[254] While these examples of recent legislation assist the justice system in responding to and deterring methamphetamine use and production, they introduce a new problem. Providing legal penalties for methamphetamine exposure or child endangerment that can result in prison sentences introduces the possibility that the children will be removed from their families and placed in foster care, temporarily or permanently. It is essential that these children do not fall through the cracks of the various systems that are responsible for them.

Drug-Endangered Children's Program

The state of California has developed specialized units to assist children endangered by methamphetamine production. The Drug-Endangered Children's program was created in 1997 under the oversight of the district attorney's offices in seven counties. In order to provide a comprehensive response to children exposed to methamphetamine production, the units are composed of multidisciplinary teams with medical personnel, child welfare workers, law enforcement personnel, the district attorney's office, and the environment health agency. The response teams are available 24 hours a day.[255] The Drug-Endangered Children's protocol stipulates that when a methamphetamine lab is seized, a Child Protective Services worker is briefed and on-site. The Child Protective Services worker evaluates the child's safety through interviewing the child, their parents, and neighbours, and documenting observations regarding the house, such as the presence of weapons or drugs. The Child Protective Services worker also ensures that the child is tested for chemical exposure. To assist medical personnel in completing their assessment of the child, the Child Protective Services worker provides the medics with a

list of chemicals found in the house. Following the examination, the Child Protective Services worker transports the child to a shelter. The Child Protective Services worker also assists in the prosecution of the parent(s) through the provision of information obtained during their interviews with the children, their parents, neighbours, school personnel, and others, as well as through the provision of information obtained during the medical examination, such as urine and blood testing results.

Since it began, the Drug-Endangered Children's program has resulted in the removal of approximately 100 children per year from drug-related endangered situations, and it has assisted in the prosecution of several hundred cases of child endangerment in the United States.[256] The success of the original Drug-Endangered Children's program has led to its introduction in other American states, as well as in Alberta.

In response to the increase in methamphetamine labs (from 13 in 1998 to 248 in 2001), and in order to provide a collaborative response to children exposed to drugs, the Washington county of Spokane introduced a Drug-Endangered Children's program in 2002. A primary focus of the Spokane Drug-Endangered Children's was to emphasize the development of interagency collaboration. In particular, the Spokane Drug-Endangered Children's program focused on encouraging collaboration between law enforcement and social services agencies to ensure that the needs of the children in a methamphetamine lab would not be ignored. The Spokane Drug-Endangered Children's team was modified slightly to include social service agencies in addition to the Child Protective Services team.

The Spokane team recognized the importance of evaluation to ensure that they met their objectives of collaborating across agencies and addressing the needs of these children. Although the evaluation is still in process, the Drug-Endangered Children's project has already highlighted several successes. By collecting baseline information at the start of the project, the evaluation identified that there was a severe lack of communication and follow-up with respect to the drug-endangered children. Specifically, there was limited information collected by the various agencies. Moreover, the information that was collected was not shared across agencies, resulting in a failure to identify the children's needs. In fact, many children did not even receive services. On a more positive note, the evaluation identified that attempts at inter-agency collaboration were supported by members of the Drug-Endangered Children's team who felt the collaborative efforts were going very well. In particular, the team was very satisfied with the sharing of leadership, team contributions, the comfortable working climate, and strong team cohesiveness. While still under evaluation, the Spokane Drug-Endangered Children's program has provided valuable information on the lack of attention paid to the needs of drug-endangered children and the importance of interagency collaboration.[257]

Alberta's Drug-Endangered Children's Act was introduced in November, 2006. The Act permits police to charge parents of children living in drug houses (e.g. methamphetamine labs, marijuana grow operations) with endangering their child's life. Police can seize the child for up to two days without needing to prove their endangerment in court. In addition, the legislation states that parents can face a maximum penalty of a $25,000 fine and/or two years in jail. Since the

introduction of this Act, 38 children have been removed, over 60% of whom (23) were located in Calgary. Proponents of this legislation are hoping that parent's attachment to their children and the threat of being separated from them will be sufficient to encourage parents not to produce drugs, endangering their child's life.[258]

Methamphetamine and Treatment

There has been a general consensus that methamphetamine addiction is not treatable.[259] However, recent research suggests that treatment can result in positive outcomes.[260] For instance, Hser reported that treatment was associated with an average decrease of five days of methamphetamine use and two crimes per month.[261] Furthermore, a study with methamphetamine clients in California residential programs concluded that nine months after beginning treatment, 87% of clients were abstinent from all drugs.[262] However, research also suggested that while some of the effects of methamphetamine appear to be reversible, others may not. Still, as mentioned above, images of the brain taken two years after the last use of methamphetamine indicated recovery in some areas of the brain; subsequent motor and verbal performance tests also showed improvement. However, other brain functions appear to take longer to recover.[263]

Substance abuse treatment related to methamphetamine has increased substantially. In the Western Cape area of South Africa, crystalline methamphetamine has become the primary substance of abuse for patients in treatment for drug abuse.[264] Between 1992 and 1996, admission to treatment for methamphetamine abuse increased by 294% in the United States.[265] Although poly-substance use is not uncommon among methamphetamine users (methamphetamine users often report also using tobacco, marijuana, and/or alcohol), for many, methamphetamine is the *primary* drug. Between 1992 and 1998, the proportion of treatment clients who reported methamphetamine as their primary drug rose for both females and males.[266] In another study of over 4,000 women in substance abuse treatment, nearly half (41.8 per cent) identified methamphetamine as their primary drug. This percentage was higher for mothers who were also involved in the child welfare system (47 per cent) compared to mothers not involved in the child welfare system (37 per cent) who tended to abuse alcohol.[267]

Treatment for methamphetamine addiction in Canada has also increased. Saskatchewan reported an increase in the proportion of those seeking treatment for stimulant use from 7.9% over 2001/2002 to 9% over 2002/2003. Statistics from the Saskatchewan Addiction Services indicated that although less than 5% of substance abuse treatment clients identified methamphetamine as their primary drug, it is reported by approximately 8% of youth and 5% of adults receiving in-patient treatment.[268]

The treatment approach that seemed most beneficial to methamphetamine users was cognitive-behavioural therapy. This approach involves the development of understanding of thoughts and actions of users and emphasizes the role between thinking and behaving. Successful cognitive-behavioural therapy replaces unhealthy thoughts with healthier thoughts that lead to an avoidance of negative behaviours, such as drug use. Cognitive-behavioural therapy attempts to change the perceptions and attitudes of methamphetamine users by assisting users in identifying triggers and cravings, and understanding where their specific cravings come from. Once individual triggers and cravings have been identified, the user is taught ways to successfully handle them. Essentially, cognitive-behavioural therapy is a learning process where clients are taught to recognize and avoid situations that could lead

to drug use.[269] Successful cognitive-behavioural therapies can involve many components, such as 12-step self-help programs, urine testing to assess abstinence, individual, family, and/or group therapy, and social support networks. [270]

A recent study in Canada using cognitive-behavioural therapy with substance abusing youth showed encouraging results. The study involved 412 youth who entered an inpatient, 28-day treatment centre in Prince George, British Columbia. Youth voluntarily entered the centre, either through a self-referral or by a referral from a health professional (physician, health-care worker, mental health professional), a parent or guardian, a school official, or a criminal justice professional. All 412 youth who entered the program between March 2001 and December 2005 were offered cognitive-behavioural therapy comprising a three-hour, once a day group therapy session over the duration of their stay.

Of the youth who entered treatment, nearly 28% were admitted primarily for methamphetamine use. Most of the youth were polydrug users, with methamphetamine using youth also using marijuana (89 per cent), alcohol (67 per cent), hallucinogens (64 per cent), and cocaine (63 per cent). Over half (61 per cent) of the youth in treatment for methamphetamine use were female and one quarter were Aboriginal.

The study compared primarily methamphetamine using youth to youth who primarily used alcohol, cocaine, and marijuana. Using the Addiction Severity Index Self-Report, which assesses for addiction problems with respect to legal, psychological, family/social conflict, alcohol, and medical outcomes, the methamphetamine using youth did not appear to have more severe addiction problems. Furthermore, both the methamphetamine using youth (50%) and alcohol using youth (51%) had higher rates of treatment completion compared to cocaine (34%) and marijuana (39%) using youth. This finding suggests that methamphetamine using youth could benefit from cognitive-behavioural therapies.[271]

In contrast to cognitive-behavioural therapy, 12-step self-help programs, such as Alcoholics Anonymous, Narcotics Anonymous, and Crystal Meth Anonymous groups, are community based and involve achieving abstinence by progressing through 12 steps of recovery; the first of which is to admit a lack of power over the use of the substance, such as crystal methamphetamine. Participation is free and anonymous. These programs are typically spiritually based, involving prayer and meditation. For example, the second step promotes a belief in a higher power, while the third step involves turning one's life and will over to a God. Regular meetings are held in which members gather to discuss their experiences and provide each other support in a clean and sober environment. While proceeding through the 12 steps, members are supported by a sponsor who encourages their recovery.[272]

While 12-step programs are popular across all of North America, they do not work for all drug users. Research indicates that programs, such as the Matrix Model, have achieved higher success rates. The Matrix Model is a four month outpatient psychosocial treatment program that combines intense cognitive-behavioural techniques with family education, 12-step programs, individual psychotherapy, relapse prevention, urine testing, and behavioural reinforcers.[273, 274]

The approach upholds several cognitive-behavioural principles and goals: to stop drug use; to learn issues that are critical to addiction and subsequent relapse through the provision of accurate information regarding the effects of stimulant drugs; to provide education for family members affected by the addiction and recovery processes; to become familiar with self-help programs; and to be monitored weekly using urine toxicology to assess for the presence of drugs, such as cocaine, opiates, cannabis, and benzodiazepines, as well as methamphetamine and breathalyzer testing for the presence of alcohol.[275, 276]

Evaluations of the Matrix Model show long-term positive effects. Some initial results described in 2002 suggested that the model could help methamphetamine abusers achieve abstinence from both methamphetamine and other drugs. This is important as it allows for a reduction in a number of potential psychiatric symptoms and assists users in obtaining employment. For instance, one study indicated that of 54 Matrix Model treatment clients who were abusing methamphetamine on a daily basis at the time they began treatment, 72% were abstinent at the follow-up after treatment. On average, these treatment clients were abstinent for 24 months. Furthermore, 78% reported that in the past 30 days that they had not used any other drugs; at treatment admission, only 42% reported abstinence from other drugs. There was also an increase in full-time employment between treatment admission and the follow-up interview. Among this group of clients, 26% had full-time employment at admission to treatment; at the follow-up interview, 62% were working full time. Finally, the clients reported that although there was not a decrease in their symptoms of depression or their experiences of headaches, there was a significant reduction in their other psychiatric and medical symptoms.[277]

Additional research indicated that between two to five years following treatment completion, participants of this program exhibited substantially less use of methamphetamine and greater occupational and psychiatric functioning. Furthermore, urine testing indicated a failure rate of only 6.5%.[278] Compared to treatment-as-usual methods (variations of outpatient treatment), the Matrix approach improved treatment retention and treatment completion, increased the length of abstinence during treatment, and appeared to result in fewer methamphetamine-positive urine samples. The greater the length of time a patient stayed in treatment (i.e. treatment retention), the better their chances of a successful result. The Matrix Model, with its 16-week outpatient cycle, appeared to be more effective than other known treatments at retaining its clients for a longer period of time. Specifically, compared to the treatment-as-usual methods, Matrix Model clients were 38% more likely to stay in treatment and 27% more likely to complete their treatment program.[279]

Matrix Model programs have also been implemented with adolescents. A study with 305 methamphetamine and non-methamphetamine using adolescents in treatment identified that Caucasian and Latino youth were more likely to be methamphetamine users than African-American youth. Methamphetamine use was the highest among the late adolescent group, and the authors summarized that use of hard drugs, such as methamphetamine, typically began later in adolescence, around the mid to late teenage years, compared to the use of

alcohol and marijuana. Many of these youth came from environments where substance use was common. They were frequently exposed to parental substance use and/or peer substance use.

In comparing those who used methamphetamine with those who did not, the methamphetamine users were more likely to display greater psychosocial dysfunctions, including depression, hallucinations, suicidal ideation, school and legal problems, and exposure to violence and abuse. The authors reasoned that the experience of depression, hallucinations, and suicidal ideation were the result of the youth's methamphetamine use. The study concluded that methamphetamine using youth were also more likely to drop out of treatment earlier. An important factor in treatment drop-out was the degree of suicidal ideation expressed by the youth. In other words, the more suicidal ideation expressed, the more likely the youth was to drop out of treatment. This association likely explained the relationship between methamphetamine use and dropping out of treatment. Therefore, the authors concluded that risk factors were not only preventing treatment from being successful, but also increased the chance of a youth relapsing into substance use. Given this, the authors emphasized the need to create innovative strategies to retain youth in treatment and the consistent monitoring of drug and alcohol use while adolescents were in treatment.[280]

Research also suggested that contingency management, a component of behavioural therapy, showed some success in the treatment of methamphetamine addiction. Contingency management entails the provision of an immediate reward (e.g. vouchers) in response to biological tests (e.g. urinalysis or breath test) that indicate substance abstinence. As more clean tests are provided, the amount of vouchers that are rewarded increase. In contrast, vouchers are withheld when substance use is indicated by the biological test. Voucher Based Reinforcement Therapy has resulted in the achievement of abstinence for some users. However, success may depend on a wide range of factors, including the type of substance that is being abused, what sort of reinforcement is being rewarded, the schedule at which the reinforcement is provided, the method of distribution of the reinforcement, the nature of the response required to earn a reinforcement, the amount of the reinforcement, the population that is involved in the therapy, and the delay in reinforcement delivery. A report in 2006 on contingency management treatment for methamphetamine users indicated that the reinforcement schedule most likely to protect against relapse was one that escalated reinforcement payments as additional substance-free biological samples were produced, but which initiated a roll-back of reinforcement as the user relapsed to substance use.[281]

Contingency management has been used in the treatment of male methamphetamine users who are both gay and bisexual. The nature and method of use, namely using methamphetamine intravenously, its popularity within gay male populations, and its tendency to stimulate the sex drive leading to high-risk sexual behaviours places the user at high risk of contracting sexually transmitted diseases, such as HIV.[282,283] Through classical conditioning, use of methamphetamine often combines with sexual behaviours among gay and bisexual male populations. Research indicates that this is a powerful relationship not easily dealt

with in heterosexual group treatment, often resulting in poor treatment engagement and early dropout from treatment for these men.[284]

A study in San Francisco evaluated the use of contingency management in the treatment of methamphetamine users by rewarding vouchers redeemable for goods and services to those men who have sex with men (MSM) who could provide urine samples free of methamphetamine. Vouchers could be redeemed by ordering through program staff who would purchase the goods and/or services over the internet or by phone. Methamphetamine use was extremely popular among this group of 143 men. Almost half (43 per cent) used methamphetamine on a weekly basis, and 38% had used methamphetamine for over 10 years. This group was characterized by high rates of injection use and they commonly engaged in high risk sexual behaviours. In fact, the large majority (88 per cent) reported methamphetamine use while engaging in sexual activity, and almost all (78 per cent) were HIV positive. The high rate of HIV combined with the popular use of methamphetamine in this sample was alarming, especially as the use of methamphetamine can worsen the effects of HIV.[285] Nonetheless, the use of contingency management was successful in this sample as over half (52 per cent) of the men were able to provide 12 methamphetamine-free urine samples. The per capita cost of operating this program was $800, which the authors deemed modest. The use of contingency management in treating methamphetamine users was encouraged by the authors, who argued that the program can be implemented with minimal training for staff.[286] Therefore, it appears as though contingency management can provide an important component of a comprehensive community treatment response to methamphetamine use.

There was little research available supporting the pharmacological treatment of methamphetamine. While pharmaceutical drugs, such as anti-psychotics (e.g. Halderol) or benzodiazepines (sedatives such as Valium or Ativan), may be useful in the short term to stabilize agitated patients as they withdraw from the effects of methamphetamine, there was no support found in the research for the use of medications to decrease the cravings for methamphetamine. Therefore, it appears as though the only current role for medications in the treatment of methamphetamine is with respect to the symptoms of methamphetamine use, such as paranoia, psychotic symptoms, increased blood pressure and respiratory rate, or depression.[287] The use of medication to deal with the symptoms of methamphetamine use is particularly important during inpatient treatment in order to ensure the safety of the staff dealing with paranoid and angry methamphetamine users.

Whether inpatient or outpatient services are more effective for methamphetamine treatment depends on a number of factors. Short-term inpatient treatment may be necessary to allow the user to detoxify from methamphetamine; however, it appears that many users of methamphetamine were able to do this more effectively and cheaply through intense outpatient support.[288,289] During the first few weeks, intensive outpatient treatment may involve between three to five sessions per week. Following this stage, two to three sessions a week are recommended for 90 days and, if possible, much longer.[290] This method provides the user with the intensive support they need

during the first few weeks of withdrawal when they tend to experience abstinence dysphoria (a state of unease), cognitive disruption, and anhedonia (an inability to experience pleasure). However, some users of methamphetamine may present with such severe psychological complications (i.e. psychosis, paranoia, agitation) that they cannot function in outpatient therapy, but require short-term inpatient treatment (i.e. 48 to 72 hours) in a medically supervised setting with the possible use of medications. For some users, the degree of psychological trauma may be so severe that a longer term of medical treatment is required.

However, other research suggested that inpatient treatment was recommended, at least in the early stages of detoxification and withdrawal from methamphetamine.[291] While coming down from the methamphetamine-induced high, the user should be located in a safe place where their paranoia is not encouraged. During withdrawal, the user should be allowed to sleep and eat as much as necessary. The use of inpatient treatment may, therefore, be recommended for these initial stages to allow the user to escape from any other distractions that may re-stimulate their use.[292] Inpatient treatment is especially important if the user is homeless.

Initial research suggested that in-patient and out-patient treatment clients differed in a number of important ways. Depression is a common symptom experienced during withdrawal from methamphetamine. Depressive symptoms appear to be more prevalent with in-patient treatment clients who completed their program. Interestingly, those who dropped out of in-patient treatment displayed a higher rate of impulsive traits. Specifically, diagnoses of Attention Deficit Disorders were more common among those who left treatment. This is an important finding as it provides support for the idea that it is particularly difficult for users with Attention Deficit Disorders to complete programs, a conclusion that is especially important given that long-term methamphetamine use can result in cognitive dysfunctions similar to Attention Deficit Disorders. This conclusion is also supported by research with cocaine-dependent treatment clients. Specifically, in order to complete cognitive-behavioural therapy, treatment clients need to be able to focus and maintain attention. Therefore, attention difficulties are associated with a lack of treatment retention.[293]

Psychosis is also an important factor in the ability to complete treatment. Psychotic symptoms appear to be more common in those who leave treatment. This suggests that treatment clients who appear to be experiencing psychosis require additional support during the recovery process. Many treatment clients also report high rates of suicidal ideation or self-harm. Overall, the rate of mental health problems appearing within samples of methamphetamine dependent clients seems to have increased over the past few years, resulting in additional health costs regarding methamphetamine dependence. It is possible that the increased psychological and psychiatric symptoms observed in methamphetamine dependent clients may be the result of increasingly potent forms of methamphetamine. In order for treatment to be successful, it is necessary to first establish stable psychological functioning prior to proceeding with treatment.[294]

Research with a sample of methamphetamine users undergoing treatment in Australia identified that the completion rate for

residential treatment was extremely low (44 per cent) even when compared to residential rehabilitation for other drugs. This suggested that residential treatment may not be as beneficial for methamphetamine users as for other drug users. Slightly more than one third (37 per cent) of those who entered residential treatment left against the advice of staff or left without notifying a staff member, while 27% received an involuntary discharge from the program for failing to follow procedures. The clients in this sample presented with a very low rate of employment (13 per cent); the majority of clients received their income through government benefits (55 per cent) or pensions (21 per cent). Most were not living in a privately owned dwelling (55 per cent in rental, 11 per cent in temporary or institutionalized arrangements, and 8 per cent were homeless), and those that did were typically living with a parent or relative (70 per cent). The generally low levels of socioeconomic status and employment were likely to adversely effect treatment outcomes. Furthermore, these various contextual lifestyle factors needed to be addressed during treatment.[295] Thus, in order to increase the chances of successful treatment, comprehensive treatment programs should focus on targeting all these areas of need, instead of focusing solely on the reduction of drug use.

Several additional factors were important predictors of treatment completion. Drop-out from methamphetamine treatment programs was higher for those with less than a high school education, those who were younger at the time of their admission to treatment, those with physical or mental disabilities, those with a more serious history of methamphetamine use, and those who injected drugs. Given the multi-problem profile of methamphetamine users and those who are most at risk of dropping out of treatment, it is suggested that additional services be provided to those with more severe problems.[296]

In a study reviewing experiences in treatment, the mean length of time spent in treatment was nearly 10 months. However, a high proportion (47.5 per cent) of users did not complete the program. For this group, 70% of the prior treatment experience was with inpatient programs and the main reasons given for not completing the program were because the user wanted to return to methamphetamine use (25.6 per cent) or because they did not get along well with the program staff (17.9 per cent). Other common reasons for dropping out of treatment involved the program itself (too costly, too lengthy, not helpful) or a change in the participant's status (participant was incarcerated, participant was accepted into a diversion program, participant changed to a support group).[297]

An additional 210 individuals in this study did not access treatment for methamphetamine use. The reasons given were primarily because they believed they did not need treatment (54 per cent), even though over 90% of the sample was identified as having a methamphetamine dependence problem. Other common reasons given were that they could/should handle their drug problems themselves, they were unaware of how to get treatment, they could not afford the treatment, they did not think any treatment programs were available, or they preferred to attend a support group.[298] These findings supported the assertion made by Rawson and colleagues that methamphetamine users were generally unwilling to enter treatment and, once they

did begin a program, they experienced high rates of dropouts.[299] Research also indicated that methamphetamine users tended to abuse methamphetamine for a longer period of time before accessing treatment compared to users of other drugs.[300]

Recent approaches to treating methamphetamine addiction focused on the use of coercive methods to encourage methamphetamine users to enter treatment and stay longer. In the United States, the Methamphetamine Interagency Task Force identified coercion as a major law enforcement strategy. Similarly, the National Drug Control Strategy emphasized the use of the child welfare system and drug courts as a means to get substance users to access treatment.[301] As discussed above, there is also a well established link between drug use and criminal activity. Research suggested that many drug users did not receive treatment, and therefore, some of the root causes of their criminality were not being addressed.

Legislation has recognized the gap between drug users who commit crime and those who access treatment. In an effort to provide greater access to treatment for those who commit crimes, a number of jurisdictions have introduced alternatives to incarceration. The *California Substance Abuse and Crime Prevention Act of 2000* allowed for certain non-violent offenders to attend drug treatment instead of a period of incarceration. In the first year of this approach's operation, over half of the treatment clients were methamphetamine users. The approaches provided under this legislation were similar to previous programs operating across the United States. For the past three decades, the Treatment Alternatives to Street Crime (TASC) has been working in many jurisdictions in the United States with local criminal justice and drug treatment systems to support alternatives to criminal justice procedures and sanctions when dealing with drug using offenders. Similarly, in Arizona, the *Drug Medicalization, Prevention, and Control Act of 1996* offered court-supervised, community-based treatment and educational opportunities for non-violent drug offenders (i.e. those convicted of possession or use of drugs). The drug court movement itself began in Florida in 1989 and has since expanded to nearly 500 adult drug courts across all 50 states. These courts were designed, in part, to provide non-violent drug offenders with access to community based treatment, while avoiding or minimizing the use of criminal justice sanctions, such as incarceration.[302]

However, mandating treatment or using coercion to force drug users to access treatment is not always successful, particularly for youth. Effective treatment for youth appears to involve short-term stabilization followed by intense community support.[303] With respect to coercing treatment, many proponents argue that successful treatment will not occur unless the user accepts that they have a problem and is ready for change. Specifically, the user must be internally motivated to change their behaviour. However, others argue that this internal motivation can be encouraged through mandated treatment. If the client is faced with a period of incarceration or is threatened with the loss of their child, these external motivations may encourage change, thus leading to the development of the necessary internal motivation.[304]

Mandating drug treatment can be the result of a number of different criminal justice processes. An individual may be mandated into treatment as the result of a court diversion program, such as mandated by the

California Substance Abuse and Crime Prevention Act, or as the result of a court order, in prison treatment, parole or probation conditions, or through drug courts. Drug courts are a recent phenomenon in which adult offenders who have committed drug-related offences are diverted into a court system parallel to that of the criminal justice system. In drug courts, offenders are motivated to accept treatment for their drug problems, thereby avoiding incarceration. Drug courts present rapid and certain consequences that are contingent upon staying in treatment. In other words, if the drug user fails to complete treatment, they are subject to more intense scrutiny and supervision and face possible incarceration. In contrast, those who participate in treatment and remain abstinent from drug use can progress through treatment to the point where legal sanctions against them are removed.[305] Drug courts operate with the three main goals of reducing recidivism, reducing substance abuse, and increasing the chance of rehabilitation. They also provide the added benefit of assisting the criminal justice system in reducing overcrowding and costs.[306]

The Vancouver Drug Court, which has received funding until 2009, operates in collaboration with Vancouver Coastal Health. The partnership allows drug users a better opportunity to have their health needs met. The Vancouver program focuses, in particular, on offenders with crystal methamphetamine, heroin, and cocaine addictions. The program allows for participants to access treatment while serving their sentence in the community. Ideally, the program intends to improve the stability of drug users in order to reduce associated criminal behaviours while decreasing backlogs in the formal court system. The program in Vancouver, however, does not involve coercive techniques. Participation is voluntary and offenders can elect to serve their time in jail if they do not wish to participate in the treatment and community service offered.[307]

To date, there has not been many evaluations of drug courts; however, available research suggests that they are effective in reducing costs, improving treatment retention, and decreasing recidivism. Researchers appear to be encouraged by the combination of drug courts and their contingency procedures with the typical ambivalence of methamphetamine users toward treatment. In other words, facing consequences that are contingent upon their treatment behaviours seems to encourage greater compliance with treatment procedures among methamphetamine users. However, some research also indicated that, while those mandated to treatment through drug courts had a higher rate of treatment completion, they also relapsed back into methamphetamine use at a faster rate than those not mandated through drug courts.[308]

A study with adults in treatment for methamphetamine use examined the effectiveness of mandated treatment programs. Of the 350 individuals in treatment, slightly more than half (54 per cent) did not complete their treatment program. A similar proportion (52 per cent) of participants reported legal pressures to enter treatment, primarily from court proceedings (37 per cent), probation or parole conditions (30 per cent), child protection services (28 per cent), or through drug courts (4 per cent). Those who were pressured into treatment reported a longer duration of treatment, an important result given that the research concluded the best predictor of positive outcomes was length of

time in treatment. As compared to the non-pressured treatment participants who stayed in treatment for an average of 3.1 months, those in mandated treatment stayed in treatment for an average of 4.3 months, while those in treatment as the result of child protection services pressure stayed for an average of 5.9 months. However, those who reported pressure to enter treatment also relapsed at a somewhat higher rate (1.7 times more likely to relapse within 6 months following treatment discharge). When all conditions were held consistent, a longer time in treatment was associated with more positive outcomes, suggesting that methamphetamine treatment should be longer in duration.

Treatment completion was also related to the nature of the treatment. Specifically, those in residential treatment were 2.4 times more likely to complete treatment when compared to outpatients. The study's conclusions supported the use of lengthy treatment and highlighted the need for continuing care to support those coerced into treatment given their slightly higher rates of relapse following treatment completion.[309]

Treatment and Gender

It is possible that there are gender differences in the abuse of drugs and, therefore, treatment needs. For instance, Hser, Evans, and Huang contended that females with small children were at risk of abusing methamphetamine as a response to their feelings of fatigue and exhaustion. In addition, women and men tended to experience differing problem areas outside of their drug abuse. While men were more likely to be involved with the criminal justice system, women were more likely to experience psychological symptoms, such as severe depression or anxiety. Women also tended to express lower self-esteem and higher rates of childhood sexual abuse compared to men. Furthermore, women who were pregnant presented a unique range of treatment necessities. The use of methamphetamine while pregnant can result in growth retardation, premature birth, and subsequent developmental disorders and enduring cognitive deficiencies. Thus, particular attention must be paid to the pre-natal needs of pregnant methamphetamine abusing mothers.[310]

Women may also fare better than men in treatment outcomes. Hser and colleagues conducted a study of over 1,000 methamphetamine abusers and found that women experienced more significant reductions in problem areas (i.e. relationship problems, medical problems, and psychiatric problems) than men when undergoing treatment. They proposed several different explanations for this result: women in outpatient treatment received a greater intensity of services compared to males in outpatient treatment and these services may have led to better subsequent outcomes; women may have been more motivated to recover from their drug abuse problem given their central responsibilities at home with their family; or women could just simply respond better to treatment than men.[311]

Recognizing these differences, recent legislation introduced in the United States focused on the treatment of particular populations of methamphetamine abusers. Introduced under the *Patriot Act* reauthorization, the *Family-Based Meth Treatment Access Act of 2006* proposed to provide up to $70 million per year in grants focusing on the treatment of pregnant and parenting women who abused

methamphetamine. The legislation allowed for grants and contracts to be awarded to both public and nonprofit private groups to provide treatment services.[312] In expanding the availability of treatment services for women in the justice system, the legislation also allowed for grants or contracts to be awarded to public or private groups assisting jails and detention facilities in providing treatment services.[313]

Pregnant women or women with young children present additional methamphetamine treatment needs. These women may be treated in intensive outpatient settings; however, it is imperative that staff working with this population monitor their client's access of prenatal services while in treatment. In addition, research has identified that there is an extreme lack of empathy from staff towards women who relapse into methamphetamine use while pregnant, which is a concern that needs to be addressed so as to avoid stigmatizing this population against accessing treatment. Women with small children need additional services when undergoing treatment for methamphetamine addiction as they often are faced with an overwhelming number of responsibilities, such as taking care of their home, their children, and the rest of their family, along with working and accessing treatment. Research indicated that in order to find sufficient energy to cope with these numerous responsibilities, these women saw methamphetamine as their only option, thereby falling back into regular use. Support for these women may involve residential treatment for women and their children or a day treatment setting where services for child care are provided.[314]

Research with treatment populations suggested that it was imperative that substance abuse treatment systems worked together with child welfare and criminal justice systems to respond to the complex needs of substance-abusing parents, and substance-abusing mothers in particular. Grella identified fragmentation in the American substance abuse and child welfare systems as a leading factor in the failure to coordinate services and case management. She noted that, until recently, child welfare workers were not trained in the process of treating substance addictions, and she questioned how child welfare workers could adequately determine what was best for the child without understanding the long and difficult process of recovery. Similarly, Grella argued that despite the fact that many women in substance abuse treatment had children who had been placed in temporary or permanent care of the state, the substance abuse treatment systems were similarly unfamiliar with the nature of child welfare and the degree to which recovery depended on an adequate response to parental needs.[315]

This is important to consider, as methamphetamine users comprise a particular subgroup within the treatment population. For instance, research has indicated that there is a subgroup of mothers in treatment who were also involved in child welfare. These mothers were more likely to identify methamphetamine as their primary drug of choice, and they were typically younger, with their treatment initiated by their involvement with the criminal justice system. In order to adequately respond to the needs of these women and their children, Grella wrote of the importance of integrating substance abuse treatment services with child welfare and the criminal justice system.[316]

The treatment of methamphetamine, therefore, often requires either a unique approach or the integration of a specialized treatment component targeted towards the particular effects of methamphetamine. Some suggestions include the importance of a nutritional component to treatment and emphasize a return to a healthy state, an extended after-care follow-up period of years after inpatient treatment, and the round-the-clock availability of a safe, non-using, supportive environment outside of treatment.[317] Other research conclusions have proposed the need to enhance psychiatric, parenting, and employment services.

A California study with methamphetamine abusers identified that, overall, most clients benefited from the comprehensive treatment model. Clients participated in group therapy, experiencing sessions focused on both alcohol and drugs. The treatment clients also participated in sessions focusing on mental health symptoms and psychosocial problems (family, parenting, employment). Over 60% completed three months of treatment and the treatment model was successful in reducing the number of days using methamphetamine per month from 2.7 at the start of treatment to 0.5 after nine months. In addition, the proportion of those abstinent from all drugs rose from 55% at the start of treatment to 87% nine months later. Slightly more than two thirds (68 per cent) of those who were abstinent from all drugs also avoided being incarcerated. In sum, the clients improved in nearly all areas of concern – drug and alcohol abuse, mental health, and psychosocial problems, with the exception of men's medical problems.[318]

Given the likelihood that methamphetamine users will engage in highly risky sexual behaviours, an important component in methamphetamine treatment should be targeted at raising awareness of how to protect oneself while using methamphetamine. The FASTLANE research project at the University of California in San Diego is an example of this additional component. The research project involved nearly 300 methamphetamine users who received counseling and intervention sessions regarding risky sexual practices. Specifically, the FASTLANE project administered a series of weekly counseling and booster sessions in which motivational interviewing and skill-building exercises targeted five domains of risky behaviour: the context of methamphetamine use; unsafe sex; condom use; safer sex practices; and social supports. This program was not developed to treat methamphetamine use directly and, therefore, it provided an example of a program that might be useful, in addition to traditional drug treatment approaches.[319]

The association between methamphetamine use and risky sexual behaviours results in an increased risk for contracting HIV or other sexually transmitted diseases. Treatment for drug abuse can act as a component of HIV prevention as treatment can result in the abstinence from drug use or the modification of drug-related risk behaviours. For instance, drug abuse treatment can educate users on the dangers of injecting methamphetamine and the risk of contracting HIV or Hepatitis. Drug abuse treatment may be able to produce a reduction in risky behaviours, such as needle-sharing and unsafe sexual activities. Through the reduction of risky behaviours, prevention of HIV or Hepatitis may occur.[320]

Two limitations of treatment discussed in a 2004 Edmonton report on crystal methamphetamine included a lack of timely access to treatment and the short duration of

most treatment programs. Many programs have waiting lists, resulting in those who want help having to wait extended periods of time for treatment. However, typically the time frame to provide resources to a methamphetamine user who wants help is extremely short. If treatment is not immediately available, the user will often return to using methamphetamine. The problem with respect to methamphetamine addiction is summarized in the following comment made by Dr. Ian Bridges:

"[e]ngagement is particularly hard with methamphetamine addicts. They won't stay in the waiting room for more than five minutes at a time. We're having to provide treatment on the fly, which can be frustrating. Among the addicted population, meth addicts are the most chaotic, most aggressive, most in need of help".[321]

With the exception of programs, such as Saint Jude Retreat House in New York, the length of treatment programs are often quite short. Saint Jude offers a program, the Jude Thaddeus Program (JTP), which is non-12 step based. For the past 14 years, the program has been evaluated by independent research companies and they have shown success rates of 65%. The JTP operates on the assumption that a substance abuser is not addictively sick, but that they have made bad choices and are in need of a helping hand. The JTP offers daily classes in which treatment clients interact with treatment instructors. There are a maximum of four clients per class, allowing for a greater degree of individualized attention. While the length of treatment in other programs is typically only 28 days long, the length of the JTP is 42 days.[322] The typically short nature of treatment does not allow the methamphetamine user to achieve a sufficient degree of recovery before they are must deal with their issues on their own. Therefore, treatment programs should operate a longer cycle and the availability of community support following inpatient treatment is paramount.[323]

Treatment Conclusion

Recovery from amphetamine use can be a long and difficult process during which the user may experience intense cravings and psychosocial problems (depression, poor sleep quality, cognitive dysfunction).[324] Cravings are commonly seen as the primary symptom of withdrawal. Cravings may result in the individual returning to substance use. Given this, cravings must remain a target of treatment efforts. Research indicated that cravings could significantly predict subsequent use of methamphetamine; the intensity of the craving increased the likelihood that the user would use methamphetamine. Knowledge regarding the intensity of cravings can assist treatment providers in determining when relatively higher levels of intervention are necessary. If a user reported that they were experiencing particularly intense cravings for methamphetamine, treatment providers might decide to provide more immediate support to that individual. For instance, users may be encouraged to attend additional self-help meetings or treatment providers might increase their frequency of contact with users during the time period following the experience of the craving.[325]

Not long ago, many clinicians and researchers believed that the brain damage caused by amphetamine use was irreversible. However, recent research has begun to provide evidence in support of the reversibility of brain damage. If users of methamphetamine

are able to stay abstinent from the drug for at least one year, it is possible for the brain to heal, initiating a process towards normal functioning.[326]

Recovery from methamphetamine often involves in-patient or out-patient treatment. As mentioned above, treatment options for amphetamines typically involve some form of cognitive-behavioural therapy. However, because of the cognitive effects of methamphetamine, amphetamine dependent treatment clients often appear distracted and may have difficulties paying attention to information provided during treatment. This state of mind increases the potential for methamphetamine-dependent clients to become frustrated, increasing the risk of not completing the program.[327]

Despite prior beliefs that methamphetamine addiction was untreatable, recent treatment efforts have begun to provide evidence of the effectiveness of treatment programs. For instance, several American states found high rates of abstinence following treatment. Between 61% and 80% of methamphetamine users were abstinent at discharge from treatment programs in Utah and Colorado, while between 65% and 88% of methamphetamine users were abstinent for a range of two to six months following discharge from treatment programs in Tennessee, Iowa, and Texas.[328] Research over 36 months with methamphetamine users in treatment indicated that treatment was associated with reductions in both methamphetamine use and criminal involvement. At initiation to treatment, methamphetamine use ranged, on average, from 11 to 13 days a month, and users committed approximately three crimes per month. Treatment was attributed with contributing to a reduction in methamphetamine use to an average range of 4.65 to 5.14 days a month and decreased criminal activity to 1.74 crimes per month.[329] Thus, it appears that recent efforts to develop treatment programs specific to methamphetamine have been moderately successful.

Due to the neurological effects of methamphetamine use, treatment often requires the implementation of additional services dealing with cognitive defects and psychological side effects, such as symptoms of psychosis, or indications of other mental illness, such as depression, anxiety, and post-traumatic stress disorder.[330, 331] Three of the major complications of methamphetamine use are nervous system abnormalities, cardiac toxicity, and immune-system dysfunction. Long-term use of methamphetamine increases the risk for stroke, cardiomyopathy (a disease of the heart muscle which is related to a decreased function and loss of efficiency and can potentially lead to heart failure), lymphopenia (a reduced number of lymphocytes in the blood reducing the effectiveness of the immune system and its ability to recognize foreign substances), and abnormal cytokine (proteins released by and regulate the immune system) secretion. These physical and psychological complications support the need for short and long-term health-related interventions in treatment.[332]

In conclusion, the most effective forms of treatment to date involve cognitive-behavioural therapies that engage the user in a learning process designed to educate them about their reasons for methamphetamine use, situations that increase their risk for methamphetamine use, and techniques to avoid use. These programs help users

understand the nature of their addiction. While many methamphetamine users appear to be able to abstain from methamphetamine with intensive outpatient therapy, the use of inpatient treatment is often recommended, at least in the first few days, while detoxification occurs.

Drug users are disconnected from their friends, their family, and themselves. They're disconnected from their core values. Reconnecting them to those values is one of the most important tasks in treatment.

Todd Ritchey, Counsellor, Lifeline Interventions
(www.lifelineinterventions.org)

Harm Reduction Initiatives

There is often a long period of time between when a methamphetamine user first begins using the drug and when they first enter treatment.[333] Harm reduction initiatives have been developed to assist users in decreasing the risks and potential harms associated with substance use without the need for the user to completely abstain from use. Harm reduction initiatives include the provision of information to those using substances and a range of assistance in addressing other related health concerns, such as housing, hygiene, and nutrition.

Specifically for methamphetamine, there are several harm reduction strategies. For instance, while not under the influence of methamphetamine, users can be encouraged to develop strategies that will reduce their risk of contracting HIV or other diseases through unprotected sexual activity or through the use of unclean needles. Users also need to be provided with accurate information regarding the effects of methamphetamine. For instance, many users believe that methamphetamine is a productive drug that results in an ability to accomplish more tasks over a longer period of time. Others believe that they can use methamphetamine in a controlled fashion; for example, that one can use methamphetamine to help with weight loss without risk of developing other problems or an addiction. Lastly, some users hold the view that injecting methamphetamine, rather than smoking it, is more economical and healthier. Accurate information regarding the effects of methamphetamine is necessary in order to assist the methamphetamine user or the potential methamphetamine user in reducing associated harms.[334]

There are several harm reduction initiatives in British Columbia and in Seattle, Washington. For example, in Vancouver's Downtown-Eastside, an area of the city where many injection and other drug users congregate, the Crystal Clear Support Training Project is a peer-training program supporting street-youth involved with methamphetamine. Youth are trained in team building, harm reduction and health maintenance, crisis intervention, advocacy, emergency response, and peer support.

The Street Spirits Theatre Company uses interactive plays to share their messages regarding important social issues, such as family violence, sexual assault, homophobia, and substance use. The company, together with Headlines Theatre, promotes a play called "Meth" which uses audience involvement to spread the message about the harmful effects of methamphetamine and what can be done to help those abusing it.[335]

A grass roots campaign in Vancouver, Buzzcode.org, focused its attention on gay men and helping them to make informed decisions about substance use and unsafe sexual practices. Similarly, Seattle operates an HIV prevention program focusing on harm reduction with methamphetamine injection users of a minority sexual orientation. This program, Project Neon, includes counselling regarding risks and harm reduction, a pre-abstinence support group, and a drop-in relapse prevention group.[336]

Methamphetamine Prevention

Due to the highly addictive nature of amphetamines, the best approach is prevention; to avoid the introduction of new users who may become addicted. Prevention programs tend to be aimed at the prevention of substance use generally, rather than being developed to deal with a particular drug. To be most effective, prevention programs should begin with children; many such programs are implemented in elementary, middle, and high schools. Regardless of the age range of users or the type of substances being abused, prevention involves a wide range of approaches, including strengthening self-esteem, improving social competence, and providing the skills with which to resist drug use.[337]

Education about the effects of drugs is also an important component of prevention approaches. For methamphetamine in particular, it is important that children and youth are educated about the potential dangers of methamphetamine. While providing youth with this information, it is also important to acknowledge the reasons why youth use these drugs. With respect to methamphetamine, prevention programs must acknowledge the different motivations based on age, gender, sexual orientation, and socio-economic status, and incorporate these factors into their prevention strategies. For example, many youth experiment with illicit substances because they are curious about the effects of drugs. Moreover, some research concluded that describing the physiological effects of drugs can actually encourage some youth to try them. By acknowledging the potential for methamphetamine to provide short-term effects, but providing evidence of its ability to quickly lead to addiction and potentially devastating long-term effects, prevention programs may allow children and youth to better understand the nature of addiction.

Many methamphetamine prevention programs have adopted a public health approach. Public health approaches involve societal efforts to protect, promote, and restore health. By addressing the risk factors associated with methamphetamine use, public health approaches can seek to prevent its use. In developing a public health approach, four steps must be followed. First, the problem itself must be defined. This requires the collection of information regarding the prevalence of use, characteristics, and consequence of use. Second, research must be conducted on the risk factors for methamphetamine use to identify which factors may be modifiable through interventions. Third, a response to methamphetamine use must be devised where interventions are not only implemented, but evaluated. Lastly, promising interventions must be expanded and supported.[338]

The public health approach to methamphetamine must include both prevention and treatment aspects. There are three components to prevention: (1) primary (universal); (2) secondary (selective); and (3) tertiary (indicated) prevention. Primary prevention is targeted at the larger population and is focused on preventing behaviours from beginning. Secondary prevention is similar in that it is focused on the prevention of behaviours before they begin; however, it is aimed at specific at-risk populations. In the case of methamphetamine, secondary prevention would likely be targeted towards populations

of street-youth and those of a minority sexual orientation. Tertiary prevention specifically focuses on those engaging in risky behaviours and who appear to have a problem. Tertiary preventions, therefore, aim to reduce the associated harms and help the user change their behaviour.[339]

Primary, secondary, and tertiary prevention should all have an individual, family, peer group, and community focus. In order to develop effective prevention strategies, programs must be built on research results that have identified risk factors, developmental factors, community-specific factors, and social factors that modify the risk of methamphetamine use. Risk factors related to the use of methamphetamine include community disorganization, poor attachment to community, family conflict, parental drug use and/or abuse, availability of drugs, antisocial behaviours, academic failure, peer drug use and/or abuse, and early engagement in substance use. In contrast, protective factors include positive bonds with family and with school, healthy beliefs and expectations, and being socially and academically competent. [340] Programs which seek to prevent the use of drugs, such as methamphetamine, should emphasize the reduction of these harmful risk factors and promote protective factors that improve the individual's relationships with family and community.

Communities can operate methamphetamine prevention programs by implementing programs that focus on the risk and protective factors for drug use in general. However, given the excessive damage that methamphetamine can produce, it is possible that by increasing awareness about the ingredients and effects of methamphetamine, prevention of methamphetamine use can also occur. Research is already concluding that youth are now more likely to view methamphetamine as a dirty drug, which may have decreased its use with this population.

A recent Australian prevention campaign is targeting methamphetamine, or "ice", by attempting to brand methamphetamine as a dirty drug. The campaign, "Ice. It's a dirty drug" is being promoted through the placement of poster and advertisements in pubs and clubs, in urinals, in trash cans and/or dumpsters, on toilet paper, and in lanes and alleys in Victoria, Australia. The goal of this awareness campaign is to promote to Australian youth and visiting tourists that methamphetamine is a dirty drug, in the hopes of preventing many from trying it.[341]

In 2004, Vancouver hosted the Western Canadian Summit, a meeting of 250 delegates from Manitoba, Saskatchewan, Alberta, the Yukon, the Northwest Territories, and British Columbia. At this meeting, a wide range of prevention approaches were identified and discussed. For example, peer outreach programs were identified as a promising option as they focused on providing access to traditionally hard-to-reach populations. This approach involveed providing information about methamphetamine's risks with information promoting healthy lifestyles and harm reduction techniques. For example, information on safer sex practices and drug use would be provided in addition to information on housing, nutrition, and hygiene. Ideally, outreach workers would be able to motivate the users to change their behaviour and reduce methamphetamine associated harms. The benefit of peer outreach programs is their ability to tailor the program to the specific community. Partnerships can be forged with local

community stakeholders and attention could be given to the relative cultural characteristics of that particular community.[342]

Saskatchewan has also introduced several measures focused on the prevention of methamphetamine use. In recognizing that the best way to respond to the methamphetamine problem among youth was to prevent them from beginning to use it, Saskatchewan emphasized health education for children and youth by offering a list of websites with trusted information on methamphetamine; integrating drug education into school curricula through the use of print, video, internet, and human resources; providing addictions services within schools; developing program supports to help vulnerable children become more resilient; and the utilization of Aboriginal Elders in the development of programs to better integrate traditional Aboriginal teachings, values, and cultures for Aboriginal youth. Saskatchewan's approach also emphasized the importance of strengthening the community and ensuring that families felt connected with the school and the community. Essentially, the initiative in Saskatchewan intended to integrate families, youth, local health authorities, and school personnel in a collaborative approach to develop and implement school-based approaches to methamphetamine prevention programs.[343]

In conclusion, the prevention of methamphetamine use appeared to be best achieved through the promotion of preventative factors, such as community development. By strengthening communities, families, and individuals, the risk of methamphetamine use was reduced. An identified root cause of drug use, in general, was the breakdown of the family and the community. The failure to seriously address this problem has the tragic result of making children victims. Research has consistently demonstrated that all children need to feel valued and have a sense of belonging. If their family or community fails to provide this sense of attachment, children, adolescents, and youth may seek out alternative methods to achieve this through negative groups and substance use.[344]

Prevention and education regarding substance use should be based on an integrated community effort. Effective prevention programs commonly involved all aspects of communities: family; schools; law enforcement; health care providers; and community agencies. However, prevention programs cannot focus exclusively on children and youth. To be most effective, prevention programs must also provide parents with a range of skills. Parenting skills that promote protective factors against drug use include the ability to communicate, to engage in discipline, and to set rules or boundaries. In addition, parents may also need to be taught how they can be more actively involved in their children's lives, how they can talk effectively with their children, how to better monitor their children's activities, how to acknowledge and respond to their children's concerns and problems, and the importance of being more aware of their children's peer groups. Finally, to be effective, prevention programs must also be independently evaluated on a consistent basis.[345]

Methamphetamine: Best Practices

The use and production of methamphetamine is a global issue and various practices have been developed to reduce both the supply and the demand of the drug. Some of the leading best practices involve education campaigns, community outreach initiatives, drug teams, information sharing, and the use of drug courts. It is also important to note that responding to and preventing the production and use of methamphetamine cannot be the exclusive responsibility of enforcement agencies. To effectively respond to methamphetamine, comprehensive prevention and intervention measures must be put in place.

> ***The production, distribution, and use of methamphetamine are surfacing in communities across Canada. Enforcement alone will not make this problem disappear. In order to tackle this issue, we need to bring people together to create effective initiatives aimed at preventing drug use and providing treatment to those who use illegal drugs.***
>
> **Supt. Paul Nadeau, Director: Drug Branch, RCMP**

Campaigns/Education

One of the most important protective factors against drug use by teenagers is a strong parent-child relationship characterized by openness and dialogue. By increasing the knowledge that both parents and teenagers have about the negative health effects of drug use, parents can protect their children against experimenting with drugs, such as methamphetamine. The state of Missouri recognized this principle when it began its health education campaign. Undertaken by the Partnership for a Drug-Free America (PDFA), the Missouri Chapter of the American Academy of Pediatrics (AAP), and the Consumer Healthcare Products Association (CHPA), the partnership attempts to increase negative attitudes towards drugs, while improving parent-youth communication about drug use. The partnership works towards these goals using a variety of media tools, such as brochures, websites, and helplines for parents and teens. The campaign offers a referral and information service; however, it is primarily focused on the prevention of drug use. This two-year health education campaign has been expanded to Phoenix, Arizona.[346] Similarly, five communities in Iowa participate in a program called Strengthening Families. This program involves several components, such as Reconnecting Youth, Life Skills Training, and Strengthening Families, as well as a targeted methamphetamine prevention component.[d] [347]

In 2004, the city of Edmonton gathered stakeholders together for a discussion on crystal methamphetamine. The most frequently mentioned need was greater public education.[348] Alberta has since developed several initiatives to raise public awareness and educate communities about methamphetamine. For instance, the Alberta Alcohol and Drug Abuse Commission produced two television advertisements focused on drug use and crystal methamphetamine. The Alberta Alcohol and

[d] These components are available online for free, at http://iconsortium.substabuse.uiowa.edu/new_Projects.html#IPMA

Drug Abuse Commission is also developing an initiative in collaboration with a number of Alberta universities for medical residents and pharmacy students to present their knowledge on the dangers of methamphetamine to students.[349]

Given the immediate risk of addiction associated with methamphetamine, it is essential that youth be provided with information about risks before they are introduced to it by their peers or others. There are numerous resources regarding methamphetamine available to youth, some of which are ideal for classrooms (see Appendix B). Videos with former methamphetamine users speaking about their experience with the drug are particularly helpful in providing youth with insight about the harmful effects of methamphetamine use.

Community Outreach Initiatives

Accessibility to information to the general public about the effects of methamphetamine use while pregnant can be limited by a number of factors, such as the educational level and the socioeconomic status of the mother. There are also certain at-risk groups of young mothers for whom obstetrician visits are infrequent, such as those living in poverty or on the street. These populations are at a higher risk for failing to receive information regarding methamphetamine use using intervention approaches that rely primarily on prenatal visits.[350] Others, such as those who live on the street, are less likely to be reached by public education efforts because they are a historically difficult to reach population.

Alternative methods, such as community outreach initiatives, may be necessary to access these particular groups of at-risk individuals in order to educate them about the adverse effects of illicit drug use, such as methamphetamine. Saskatchewan has followed this approach by opening up several community outreach centres that provide at-risk populations information on substance use. Additional outreach efforts may involve mobile addictions units to seek out at-risk populations not otherwise likely to access treatment (e.g. street youth). Mobile units may be able to increase levels of awareness and encourage harm reduction behaviours that will lessen the potential for negative effects resulting from methamphetamine use.

A grass-roots organization in Washington, the Washington State Methamphetamine Initiative, created a series of community action teams across the state. Teams included representatives from multiple resource areas, including treatment professionals, law enforcement officials, public health officers, and educators. These teams provided many of the local community mobilization, education, and prevention activities to the community.[351]

Health Workers Knowledge

It is necessary to assess the level of knowledge among obstetricians and other physicians regarding the short and long-term effects of methamphetamine use among pregnant women. Arria and colleagues identified that 5% of new mothers in their hospital sample admitted to methamphetamine use during their pregnancy. The researchers concluded that there was a need to educate primary care physicians and specialty practitioners, such as obstetricians and gynecologists, about methamphetamine treatment options and available community resources.[352] Given the relatively high rates of methamphetamine

use, research should be conducted to assess the level of awareness among physicians and obstetricians about their knowledge of the signs of methamphetamine use and available treatment and resource options for client referral. Once current level of awareness among practicing physicians has been assessed, the city can subsequently assess whether the community would benefit from the development of local policies involving public awareness campaigns about the harms of methamphetamine use for physicians and specialty practitioners.

School nurses may also play a particularly important role in detecting those children and youth at high risk for methamphetamine use, as well as those already engaging in drug use.[353] Nurses should be encouraged to intervene when they recognize early symptoms of drug use. Furthermore, the provision of addictions counsellors in schools would enable the child or youth to immediately obtain assistance. The province of Alberta offers a comprehensive school strategy in which addiction counsellors are located in schools. Counsellors assist students who have problems with drugs or who are affected by another's drug use.[354] By providing counselors, and training them to recognize the signs of methamphetamine abuse and production, important interventions can be provided for children and youth whose direct and indirect problems with drugs may otherwise go unnoticed or unaddressed.

School nurses can also play a vital role in recognizing when children may have been exposed to methamphetamine use or production. While it would be wise to first assess the current levels of knowledge regarding methamphetamine use and production, it would be beneficial to train all school nurses and other staff (teachers, principals, etc) to recognize the signs of exposure. For instance, inadequate parenting, a lack of cleanliness, lack of appropriate school dress (either insufficient or inappropriate clothing), inconsistent attendance at school, frequent or untreated illnesses, lack of academic progress, poor social skills, and delinquent behaviours may all be signs of a child exposed to methamphetamine use or production. School staff should also note that, as a result of exposure to the byproducts of methamphetamine production, the child may smell of cat urine. Therefore, it is recommended that school districts assess and increase staff awareness regarding the signs of parental methamphetamine use and production, and establish consistent school policies to respond to staff concerns regarding the child, such as where to physically locate the child while addressing methamphetamine related concerns and who to call for assistance.

Health workers in emergency departments of hospitals also face a variety of risks when confronted with methamphetamine using patients. When methamphetamine users come down from their methamphetamine induced high, they are often in a very agitated state. Due to the potential for violence, these patients often need to be sedated using benzodiazepines. As a result, some hospitals have developed methamphetamine-specific policies detailing response strategies, including the detoxification period, psychiatric needs, and long-term recovery of the patient. Due to the potential of receiving burns as a result of methamphetamine production, hospitals may consider screening all burn patients for the presence of methamphetamine. Given that medical staff may not be informed about a patient's

potential association with methamphetamine, screening patients for methamphetamine using urinalysis would allow medical staff to better manage their patient's treatment. It is also recommended to use skin pH testing when the nature of the burn is unknown as this will assist medical staff in determining if the burn is the result of chemical exposure.[355] Hospitals may also consider a protocol emphasizing the need for collaboration between emergency room and psychiatric departments. Collaboration with HazMat teams is also recommended as burns as a result of methamphetamine production are often chemical-related. This would allow for medical staff to be updated on information concerning the nature of the chemical(s) that may have caused the burn which, in turn, would allow medical staff to respond more effectively to a patient's medical needs.[356]

Given the increased tendency of methamphetamine users to engage in risky sexual activities, some jurisdictions have recommended a low threshold for screening for sexually transmitted diseases for those suspected of using methamphetamine. This is especially true for those of a minority sexual orientation given that their already high rates of HIV transmission can be affected by the use of methamphetamine. Given this, another hospital protocol may involve the requirement for sexually transmitted disease screening for patients involved in methamphetamine use.

Drug-Endangered Children Units/Teams

Drug-endangered children's teams were created in response to the needs of children living in methamphetamine labs. Too often when officials responded to clandestine methamphetamine labs, the response was not coordinated enough to fully provide for the needs of drug-endangered children. In the past, children's needs were overlooked as the various responding agencies mistakenly assumed that another agency took responsibility for the children. As a result, children's needs were ignored, important evidence regarding their endangerment by their parents was not systematically collected, and children suffered both in the short and long-term as their physical, psychological, and emotional needs were overlooked.[357] American research suggested that many Child Protection Service files were incomplete, lacked assessments regarding safety, and failed to include medical information and referrals for treatment. These results speak to the need to develop a response team characterized by interagency collaboration; law enforcement to be primarily responsible for the mechanics of the methamphetamine lab take down, child protection services to deal with the short-term vulnerability of the children (shower, clean clothes, temporary safe place), social services to deal with long term vulnerability (emotional/psychosocial effects of being removed from parents, special needs resulting from neglect, abuse, malnutrition), and the legal team to focus on the legal response to child endangerment. To be kept in mind during this process is the need to integrate services to assist parents. Research often does not identify parental needs, including their need for treatment, their need for housing assistance, or their need for employment.[358] Therefore, while the drug-endangered children units should primarily focus on the needs of the children, to be comprehensive, the drug-endangered children response must also be aware of the needs of the rest of the family.

In recognition of the failure to protect children who have been endangered by drugs, Drug-Endangered Children Teams were created to provide a comprehensive and coordinated approach to clandestine methamphetamine labs that threatened the physical and psychological well-being of children. The teams are interdisciplinary composed of members from the fire department, police, social work, public health, and law enforcement systems. Together, these response teams, which are available 24 hours a day, attend methamphetamine lab seizures to respond to the needs of any children found onsite and to assist in investigations. All members of the team receive training regarding methamphetamine production and the collection of evidence.[359] The sharing of information between agencies, as well as inter-agency collaboration, is encouraged in order to provide a successful coordinated multi-agency response.

To be effective, it is important that policies are developed explicitly stating the respective roles of each agencies. For example, law enforcement representatives may be responsible for the collection of clothing worn by children found in methamphetamine labs, while mental health professionals focus on the emotional and psychological needs of the children, assessing their mental condition and referring them to subsequent treatments and therapy. Medical professionals may be responsible for assessing the physical well-being of children, in addition to collecting urine samples within the first 12 hours of the child being removed in order to provide evidence supporting the child's endangerment by exposure to methamphetamine. Child care workers are often responsible for coordinating the child's movements during the period following their removal, such as providing them with transportation to and from various appointments (e.g. medical doctor, mental health care) and coordinating the communication between legal systems, such as the criminal justice and family court systems. The role of public safety officials, such as firefighters, may not be limited to dealing with the immediate needs of the scene (i.e. shutting down the cooking if applicable, increasing ventilation, removal of chemicals), but making referrals for drug-endangered children who they find on the scene. Because of the wide range of roles that each responding agency is responsible for, creating policies that establish the various roles and responsibilities for each agency is recommended.[360] It is also recommended that once a drug-endangered children unit has been established, guidelines should be reviewed at least every five years and local methamphetamine action teams should send a representative to drug-endangered children training annually.[361]

Policies of this nature have been developed in several American states, such as California, Idaho, and Washington. These drug-endangered children teams are composed of medical staff, law enforcement, child services, and legal staff (e.g. prosecutors). When children are affected by methamphetamine, the policies stipulate that a comprehensive physical examination be conducted. Coordination between community agencies, such as child protective services and hospitals, is strongly encouraged, and decisions regarding the child are made in conjunction with all related parties, such as the extended family, child services, and hospital staff. Hospital protocols when dealing with methamphetamine-affected children may involve toxicology screens for the presence of methamphetamine, benzodiazepines, or antihistamines, as these

drugs are sometimes administered to children by their parents to keep them sedated during the parents' methamphetamine use or production.[362]

Children found in methamphetamine labs also need to be decontaminated as their clothing and skin may be covered in chemical byproducts. Iowa's drug endangered children's team has benefited from the use of a donated recreational vehicle that has been converted into a holding area in which to safely keep children and youth during the initial investigation or take down of a methamphetamine lab. By taking the children and youth out of the lab, they avoid the possibility of having to witness their parents being arrested, they can be given a decontamination shower, dressed in clean clothes, and occupied with toys.[363]

In Canada, drug endangered children's teams operate in the province of Alberta. In November 2006, Alberta passed the *Drug Endangered Children Act* empowering officers to remove children from homes where drugs are sold or produced and to hold them for up to two days. Following this two-day period, if children cannot be returned safely to their homes, they receive services under Alberta's *Child, Youth, and Family Enhancement Act*. Alberta is currently the only jurisdiction in Canada with the authority to charge parents with exposing their children to drugs. Law enforcement officials are provided with training on how to investigate cases, such as techniques to interview children without causing them undue stress or fear towards their caregivers. Investigators learn to recognize environmental signs indicating that a child is drug-endangered. Within two weeks of the legislation passing, police in Edmonton applied the legislation to remove a child from a drug house containing drugs, weapons, and ammunition.[364] At this point, British Columbia does not have similar legislation; however, the success of drug-endangered children programs in the United States, as well as the recent experience in Alberta, suggests that it is time for British Columbia to consider enacting similar legislation to provide a more comprehensive response to the needs of drug-endangered children. It should be kept in mind that children are not the only group of vulnerable people harmed by the presence of a methamphetamine lab. Other vulnerable groups, such as seniors, are also at risk by methamphetamine production. Therefore, communities should consider establishing guidelines similar to those used for drug-endangered children to be used with vulnerable adult populations who may be left homeless or ill by methamphetamine production.[365]

Access to Materials

Given that methamphetamine producers may steal anhydrous ammonia from farm tankers, education to farmers regarding the importance of restricting access to these raw materials is essential. Other jurisdictions have attempted to restrict access to dangerous chemicals by locking up farm tankers at night or keeping their chemicals in fenced areas. Farmers in several Midwestern states use tamper tags which notify the owners when tanks of anhydrous ammonia have been tampered with.[366] Provinces, such as Saskatchewan, have attempted to increase awareness among farmers regarding the use of anhydrous ammonia in methamphetamine production. Farmers in several American states have begun to add GloTell to their supplies of anhydrous ammonia. This product produces a pink stain on anyone who either touches the fertilizer or uses the end product of methamphetamine.[367]

Methamphetamine producers require access to the main ingredient of methamphetamine; namely ephedrine or pseudoephedrine. Both Canada and the United States have passed legislation restricting the sales of drugs containing ephedrine or pseudoephedrine. However, recent reports from the United States indicated that there were shortcomings to this approach. Pharmacies in the United States do not share information regarding the sales of these products with their competitors. In fact, only two companies operated databases containing information on the sales of pseudoephedrine in their stores. This has resulted in methamphetamine producers moving from pharmacy to pharmacy in order to purchase the limited amount of pseudoephedrine allowed.[368] Given this, it is essential that pharmacies share information regarding the identities of those who purchase products containing ephedrine or pseudoephedrine, as well as keep accurate records and share information on the frequency of purchase and the amount purchased.

While the legislation restricting the purchase of precursors has been moderately succesful in the United States, the methamphetamine situation appears to be quite different in Canada. Many of the labs in the United States are small "mom-and-pop" operations. As a result, the precursor ingredients needed to produce methamphetamine are often bought 'over the counter' at pharmacies. Restrictions on the purchase of precursor ingredients has, therefore, resulted in substantial decreases in methamphetamine production in the United States.[369] However, according to a recent report from Alberta, the majority of methamphetamine sold on the street in Canada was produced in either superlabs or mid-sized labs, with only approximately 5% of methamphetamine on the street being produced by smaller "mom-and-pop" type operations.[370] Many of these large-scale producers bought the precursor ingredients, such as ephedrine, in bulk format. The Alberta report recommended that stricter guidelines be introduced with respect to the bulk sale of precursor chemicals. For instance, the report suggested that to restrict improper or illegal use, the buyer should provide a detailed summary of the intended use of the chemicals, that a site inspection of where the chemicals will be held or used be conducted prior to completion of the sale, that regular inspections be made following the sale of the chemicals, and that sellers of these precursor ingredients regularly report on their sale to the authorities to allow for better tracking of ingredients.[371]

Housing and Contaminated Property

In all cases, the production of methamphetamine contaminates the immediate and surrounding area around the lab, requiring extensive clean-up. Several public awareness strategies have been suggested for methamphetamine contaminated properties. For instance, several American states provide the public with lists of properties that previously contained a methamphetamine lab. In addition, recommendations in the United States include that when a property is suspected of being contaminated by methamphetamine, law enforcement or other officials should post a health warning and fully inspect the property within two weeks. Furthermore, if access to the property is denied, the recommendations stipulate that a court should be able to issue a warrant allowing the property inspection and/or the seizure of that property. If the property is then found to be contaminated, a health

official could declare the site prohibited for use. Health officials should also be able to issue emergency orders should they feel the public is in danger from the contaminated property.[372]

In the United States, there are polices in place by which municipal governments can seize control of properties and either condemn or resell them. Condemned properties must meet two of three conditions: (1) they must not have been occupied for one year; (2) they must be deemed a threat to public health, safety, or welfare; or (3) they have been associated in the past year with illegal drug activity. One possibility is that houses meeting these conditions be decontaminated and turned into residential treatment centres or shelters. Recommendations made by the Washington State Task Force included the establishment of a pilot project in which abandoned properties are foreclosed by the government, subjected to decontamination procedures, and subsequently used for public purposes, such as the provision of clean and sober housing. [373]

Housing issues related to methamphetamine also involve the increased risk for homelessness. For instance, those who become addicted to methamphetamine will likely be unable to work for lengthy periods of time as they binge and crash on the drug. Subsequently, they may lose their housing. Similarly, youth who live in transition houses and who use the drug may be asked to leave their housing and, with no other option, may turn to the street or access abandoned housing. Furthermore, research indicated that drug offenders released into the community typically had difficulty obtaining access to clean and sober housing which increased the likelihood that they would relapse into their previous pattern of drug use. By seizing abandoned or otherwise condemned housing, decontaminating the property, and using it for clean and sober affordable housing, former drug users would be given an additional protective factor to assist them with their reintegration into their communities.[374]

In terms of the clean-up of contaminated methamphetamine labs, some practices allow for the property owner to conduct their own clean-up. In order to ensure that this has been done adequately, several guidelines should be followed. For instance, property owners should submit a work plan to public health officials in which they detail their plan to decontaminate their property. Property owners should only be permitted to hire an authorized contractor (those who have been certified by the local health department) to conduct the clean-up. Only when the property has subsequently been re-tested by an independent third-party and determined to no longer be contaminated should the property be deemed viable for use. The property owner would be responsible for the costs of the clean-up and the appropriate disposal of materials, as well as for the costs related to testing for contamination. In order to minimize the health risks to those in the area surrounding the lab, clean-up must occur within a reasonable time period. Not completing the clean-up within this time frame should result in the property owner being liable to a fine and/or other legal actions.[375]

Drug Courts

Drug courts are a relatively new phenomenon and have demonstrated some measure of success with respect to methamphetamine treatment. Drug courts allow for non-violent offenders to be diverted from the criminal

justice system in exchange for participation in treatment. In effect, it is an approach designed to encourage successful rehabilitation. The state of Wyoming took this concept even further by making treatment an essential component of sentencing. While a judge can elect to sentence an offender to incarceration, they cannot do so unless they have explicitly considered a treatment option. This is a provision of the *Addicted Offenders Accountability Act* which stated that all those convicted of a felony crime receive a full substance abuse assessment. The assessment allows for the systematic documentation of the severity of the addiction and the services required by the offender. A by-product of the assessment was the ability of the state to collect detailed demographic and criminal information regarding offender characteristics. For instance, data collected indicated that most offenders failed to complete high school, most had no job skills or trade, a majority (60 per cent) of the female offenders were sexually abused as a child, many used methamphetamine for over three years, and most had never received treatment.[376]

Treatment of methamphetamine is not likely to be effective unless it occurs for at least four to six months; ideally, treatment engagement will last at least one year. Quite often, methamphetamine users will enter treatment, only to leave it within a few months time. Drug courts encourage a sustained involvement in treatment by providing consequences if offenders fail to attend treatment or relapse into drug use. Drug courts take a contingency approach in which offenders receive positive rewards if they access treatment and abstain from drug use. In contrast, if the offender fails to access treatment or is found to be using drugs, they are returned to the criminal justice system where they may receive a prison sentence.[377] A further important element of drug courts is that they allow offenders to access treatment resources in the community.

Treatment

A large proportion of women who enter substance abuse treatment have children who are dependent upon them. Furthermore, approximately half of these mothers also have had contact with child welfare systems. The relative isolation of each of these systems means that when mothers enter substance abuse programs, little information is available regarding the custody status of their children. However, this can be an important component of the recovery process. Research suggested that when mothers were able to have their children nearby during inpatient drug treatment, outcomes tended to be more positive.[378] Thus, it is important that substance abuse treatment programs and child welfare systems integrate their approaches when dealing with substance addicted mothers.

Encouraging public awareness regarding treatment options is also essential. In recruiting their sample for the FASTLANE research project out of the University of California, San Diego, researchers employed a range of public awareness strategies. A large-scale poster campaign targeting various ethnic groups and communities was employed with the assistance of local businesses. Posters were located with the consent of business owners in areas popular with young adults and methamphetamine users, including bars, after-hours clubs, and adult bookstores. A smaller-scale media campaign placed advertisements in local newspapers and magazines. The researchers also used direct contact between outreach

workers and potential program participants. For example, along with condom packets, the outreach workers would give out project cards with eligibility information for the study. The outreach workers targeted areas in the San Diego region that had a high concentration of methamphetamine users and young adults. Finally, the researchers also accepted referrals from local health centres and agencies. In effect, case managers and program staff could pass information to their clients, and family, friends, and participants of the program were also encouraged to make referrals.[379]

Such methods could be useful in other communities. For instance, if a municipal government desired to implement a new treatment program for methamphetamine users, they could use these methods to generate a sample of volunteers. In addition, given that a proportion of the San Diego methamphetamine users did not know treatment for methamphetamine was available, these methods could be used to advertise the availability of methamphetamine treatment programs. Lastly, communities may want to hold focus groups with several populations (teenagers, young adults, rural families, educators) to assess their levels of awareness regarding methamphetamine use, its effects, and the availability of treatment.

Program Evaluation

Experience with other jurisdictions suggests that an essential component of an effective response to the methamphetamine problem involves holding programs accountable. Holding programs accountable involves the evaluation of both prevention and treatment programs to ensure services meet strict standards. Wyoming's methamphetamine initiative denies funding to any prevention or treatment program that does not meet this standard. In addition, treatment programs do not receive referrals from courts if they do not meet established standards.[380] Programs should be evaluated consistently to determine whether they achieved their intended goals. Furthermore, research of programs allows for program improvements to be made. Research has demonstrated that a leading reason for drug users leaving treatment was the failure to get along with treatment staff or the persistent breaking of program rules. A better understanding of these issues would allow programs to improve the quality of services provided, thereby increasing the possibility of treatment completion. As mentioned above, for results of evaluations to be valid, it is essential that evaluations be conducted by independent organizations.

Lab Takedowns

A consistent response to methamphetamine lab takedowns must be developed to ensure that the safety of those involved is paramount. Alberta has recognized the need to develop provincial protocols and has produced protocols and guidelines for first responders. This protocol requires that first responders receive information and training on working with hazardous materials and exposure to toxins. In addition, they are trained in how they can contribute to the cleanup process of labs and dump sites. In 2004, a Methamphetamine Clandestine Lab First Responders Course was developed to help promote these guidelines. In addition, the Fire Commissioner's Office created a training video to educate first responders.[381]

Alberta has also proposed to study the utility of cost-sharing when it comes to the

takedown of methamphetamine labs. The Working Group on Methamphetamine explored both the costs associated with lab takedowns and the options for cost-sharing agreements.[382] Given the expense involved in taking down methamphetamine labs, as well as the number of agencies involved (police, fire, HazMat, potentially child services), cost-sharing protocols should be designed.

Current Examples

There are currently several examples of provinces in Canada responding to the challenge of methamphetamine through the creation of task forces and protocols. These task forces and strategies have implemented several of the best practices listed above. Generally, in responding to the problem of methamphetamine, particular emphasis has been placed on strengthening communities, broadening public awareness, targeting the sale of precursor ingredients, and establishing protocols and guidelines for first responders.

British Columbia

In 2004, British Columbia announced its integrated strategy to fight crystal methamphetamine in its communities. The primary elements of the British Columbia strategy involved the development of a close relationship with the RCMP and municipal police forces to work together to shut down methamphetamine producers and dealers by identifying and taking down methamphetamine-producing labs, working with the B.C. College of Pharmacists and Health Canada to make it more difficult to order or purchase large quantities of cold medications used in the production of methamphetamine, and putting pressure on the federal government to increase methamphetamine-related production and trafficking penalties.[383]

In 2004, British Columbia organized the first western Canadian summit on methamphetamine. Conference delegates included government officials, health-care workers, such as doctors, counsellors, and pharmacists, and criminal justice employees, including lawyers and members of the police force. Participants discussed the nature of methamphetamine abuse in British Columbia, with a particular focus on the extent of methamphetamine use, the harms and associated health effects of methamphetamine use, prevention and health promotion strategies, treatment and intervention options, and production and enforcement issues. [384]

As part of the British Columbia strategy, the provincial government established the Crystal Meth Secretariat within the Ministry of Public Safety and the Solicitor General. The Secretariat was initiated to help the province develop a methamphetamine action plan and to assist the province with its cross-government response to methamphetamine. The Secretariat, along with the Vancouver Island Health Authority, the Union of B.C. Municipalities, the Crystal Meth Society of B.C., and the Centre for Addictions Research of B.C., sponsored a prevention network conference. The conference brought together over 50 community groups and organizations, including First Nations representatives and local health workers, who discussed their ideas for responding to crystal methamphetamine. [385]

In 2005, British Columbia Premier, Gordon Campbell, introduced a $7 million initiative to fight crystal methamphetamine in British Columbia. This response focused on three main areas: (1) community-based initiatives; (2) treatment; and (3) public awareness. In total, $2 million in funding was allocated to various community-based anti-methamphetamine initiatives through individual grants, such as community task-forces, First Nations community presentations and workshops, and various awareness and prevention projects, including crystal methamphetamine forums and the production of educational videos. [386] [387]

Another $2 million of this $7 million initiative was used to expand treatment options, such as counselling (individual and group) and recovery support. In addition, the annual funding amount to be spent on crystal methamphetamine and youth addiction services was increased by $8 million. This additional funding was allocated to increasing by 75% the number of treatment beds available for youth within the province and further support the development and enhancement of treatment services for British Columbia youth. Of this money, $2 million will go directly towards crystal methamphetamine treatment programs, while the remaining $6 million sould be used for the treatment of addicted youth.[388]

British Columbia has recently introduced some innovative treatment models for methamphetamine. In 2006, the Fraser Health Authority initiated the Matrix Model of treatment in the Maple Ridge Treatment Centre. The one-year pilot program used multiple techniques to support youth between the ages of 16 and 24 years old addicted to crystal methamphetamine. The program offers withdrawal management, counselling, peer education and support, and family education and support, and provides the youth with a mentor to assist with community re-integration. The Maple Ridge Treatment Centre is simultaneously offering a youth home detox program designed to allow youth to go through detox either at home at or another safe and supportive place.[389]

Finally, $2 million of the strategy funding was allocated to the 2006 media campaign designed to raise awareness about the dangers of methamphetamine. The final $1 million was allocated to school-based public awareness initiatives.[390] Finally, the Crystal Meth Secretariat received an additional $2 million in funding to direct towards the protection of youth.[391]

As part of their public awareness campaign, the British Columbia government sponsored various crystal methamphetamine community forums held in towns across the province, including Vancouver, Kamloops, Prince George, Courtenay, and Richmond. The community-forums were designed to work towards the development of a local response to methamphetamine. [392]

In addition, within British Columbia, there are several websites offering information on methamphetamine. The British Columbia government operates a website called No 2 Meth; designed to provide information on the nature of methamphetamine and its dangerous effects. Students can learn the facts about methamphetamine while playing several interactive games. The website offers parents a free downloadable Parent's Guide to Crystal Methamphetamine, which provides them with background information and tips on how to deal with a child who is using methamphetamine or other substances. For teachers, the website provides facts as well as teaching resources to be used with students between grades 6 and 12.[393]

Another important British Columbian development is the Crystal Meth Society of British Columbia, a registered charity that supports communities by providing education, enforcement, and treatment. The Society was initiated, and is primarily run, by concerned parents and citizens who volunteer their time. In educating youth about the dangers of methamphetamine, the Society operates a Meth Info Show for high schools. The show educates youth by presenting facts about methamphetamine, showing the hard-hitting "Death by Jib" video,

and holding a question and answer period. Whenever possible, the show is presented by a facilitator as well as a youth in recovery from substance abuse. Since it began showing to middle and high-school youth, over 12,000 youth have seen the Meth Info Show. For interested communities that the Society is unable to visit, a resource kit is available for use.[394]

In terms of enforcement, the Crystal Meth Society, together with Victoria Police, operates a Meth Watch program in Victoria. The Meth Watch program is a voluntary program designed to restrict the suspicious sale of methamphetamine ingredients. Participating retailers monitor the sale of methamphetamine ingredients, such as ephedrine and pseudoephedrine, and may limit the amount of ingredients that one is able to purchase. Retailers may also train their staff to be aware of suspicious purchases and instruct workers to contact the authorities if they believe a suspicious purchase has occurred.[395]

The Crystal Meth Society also operates a Court Watch program, where court cases involving methamphetamine are recorded and tracked. By evaluating Victoria arrest and intake records, the Society seeks to identify the extent of the crystal methamphetamine problem in relation to the criminal justice system.[396]

In terms of treatment, the Crystal Meth Society has partnered with the Salvation Army to open a six-bed residential service for addicted youth. Beds are available for 20, 40, or 60 days. The Society also promotes resources for youth and their families. Finally, the Society acts as an advocate for youth, their parents, and service providers through meetings with the provincial government and by making presentations to the legislature.[397]

Several communities in British Columbia have recently introduced bylaws related to methamphetamine production. On Vancouver Island, a proposed bylaw targeting buildings used in the production of methamphetamine would require an owner to clean-up the lab within 14 days. The bylaw reads that the owner must contract a certified industrial hygienist with experience in dealing with methamphetamine-damaged properties, to have them both develop a plan for remediation, and to supervise the professional clean-up of the property. An additional bylaw allows property owners to be charged with the costs related to the use of emergency personnel and clean-up. This bylaw also permits the revocation of occupancy permits by municipal fire and inspection officials, and allows them to shut off both electricity and water until all drug-related materials have been removed from the property.[398]

British Columbia courts have also begun to respond to the methamphetamine problem by upholding the penalties imposed on those involved in marijuana or methamphetamine labs. A recent Court of Appeal decision determined that, under section 16.1 of the *Controlled Drugs and Substances Act*, property used in drug operations could be seized by the authorities. This policy applies not only to homeowners who operate labs, but to homeowners who knowingly allow others to conduct drug operations on their property.[399]

Saskatchewan[400]

In 2004, Saskatchewan identified its intention to develop a strategic response to amphetamines. The strategy emphasized the need for collaboration between government

agencies, health care authorities, professionals, families, and communities. The strategy reflected an awareness of the importance of service integration. In general, the province's strategy was to integrate services ranging from prevention to enforcement to treatment under a broad drug and alcohol service plan that allowed for the delivery of targeted services to high risk populations to prevent and reduce the use of crystal methamphetamine and its associated harms. The plan specifically identified youth, Aboriginal people, street people, and Northern residents as high risk populations.

Regarding prevention, the Saskatchewan strategic plan described the use of public awareness techniques to increase the knowledge of children and their parents regarding drugs, such as crystal methamphetamine. The strategy supported the use of drug education in schools and encouraged the development of programs that deal with addictions as well as programs targeted towards high-risk youth. The strategy also recognized the value of re-connecting Aboriginal youth with their elders to facilitate the sharing of cultural values, knowledge, and beliefs.

In improving knowledge regarding crystal methamphetamine and other drug abuse, a key action of the Saskatchewan strategy was education. This strategy involved advertising campaigns, public forums, and conferences. The media campaign was promoted along with supportive educational materials to increase public awareness. The strategy encouraged the distribution of factual information and acknowledged the value of professional networks. The Saskatchewan strategy also involved the development of a community resource guide containing information on the effects of crystal methamphetamine, how it is produced, and tips on how to recognize clandestine labs.

With respect to treatment, the Saskatchewan strategy provided funding in support of both inpatient and outpatient services, and to support the care of high-risk and vulnerable children and adolescents. Given that high-risk populations for methamphetamine use are often hard to reach (e.g. street youth, pregnant drug addicted mothers, injection drug users), part of the treatment initiative was the development of community based outreach centres accessible to high-risk populations. In addition, mobile treatment units would be used to provide integrated services to these high-risk populations. The initiative also recognized the importance of providing stability during withdrawal. Given this, the strategy included the promotion of youth stabilization through increasing the availability of detoxification beds.

To improve the services offered, the strategy recognized the need to increase service provider skills and also provided for a database of addictions services for province-wide use. Acknowledging the association between poor mental health and drug abuse, the strategy offerd programs that integrated these services. The strategy also identified the need for specialized treatment services when dealing with crystal methamphetamine. Finally, in recognition of the value of evidence-based approaches, the strategy's treatment plan also involved the use of research to identify best practices for both prevention and treatment.

A final key action of the Saskatchewan strategy involved a reduction in the supply of drugs. The province intended to use existing legislation to target methamphetamine labs, but also encouraged the federal government

to strengthen the legal penalties applicable to methamphetamine users and producers, and to improve the legislation related to the possession and procurement of the ingredients of methamphetamine. The province also intended to provide local agencies with the knowledge of federal drug professionals by establishing partnerships and knowledge exchange programs with federal drug experts. Furthermore, in responding to drug production and trafficking, the strategy focused on involving a wide range of criminal justice professionals.

Alberta[401]

The province of Alberta is also developing a coordinated response strategy to methamphetamine. Five strategic priorities have been identified: (1) leadership and accountability; (2) partnerships and community capacity; (3) information and research; (4) continuum of services; and (5) legislation and regulations.

With respect to leadership and accountability, Alberta recognized the need for coordinated leadership to provide direction and policy. In 2003, a Cross-Ministry Working Group on Methamphetamine was developed with representatives from the Solicitor General and Public Security, Alberta Alcohol and Drug Abuse Commission (AADAC), Justice and Attorney General, Education, Environment, Aboriginal Affairs and Northern Development, Agriculture, Food and Rural Development, Children's Services, Municipal Affairs, the RCMP, and the Edmonton Police. The direction provided by this group has focused on five areas for response to methamphetamine: (1) research and information; (2) awareness, prevention, and treatment; (3) cleanup and disposal protocols and guidelines; (4) legislation and enforcement; and (5) co-ordination of roles and responsibilities.

Alberta established several task forces and committees to deal directly with the issue of methamphetamine. A workshop in 2004 combined the knowledge of over 300 professionals and community members in developing recommendations for a coordinated provincial response to methamphetamine. In 2005, Premier Ralph Klein established the Crystal Methamphetamine Task Force. This group was directed to provide recommendations to government on province-wide strategies to deal with the supply and demand of methamphetamine. In September 2006, the Task Force presented the government of Alberta with 83 recommendations ranging from website prevention strategies to the mobilization of communities. [402]

The second priority identified by Alberta was the need for partnerships and community capacity. To fulfill this priority, Albertan communities, residents, universities, community groups, police, and government must work together. Over 50 community drug coalitions were given funding to devise strategies (public awareness, prevention, coordinated law enforcement) to deal with methamphetamine and other substance use. Annually, the Alberta Alcohol and Drug Abuse Commission hosts a forum for these coalitions in order to share information on best practices in responding to substance use. In 2004, the Edmonton Community Drug Strategy was created to encourage the practice of harm reduction to youth under the age of 25 years old using alcohol and drugs.

First Nations groups in Alberta are also involving themselves in the provincial strategy against methamphetamine. In 2005,

the Alberta First Nations Crystal Methamphetamine Strategy Committee was established. This committee was tasked with creating an action plan for First Nations people in Alberta. In addition, four Aboriginal Crystal Methamphetamine Conferences for First Nations people were funded in 2006. Additional conferences were also organized. For example, in 2006, health care providers were brought together to discuss crystal methamphetamine. This conference was co-hosted by the Alberta Alcohol and Drug Abuse Commission, the Alberta College of Pharmacists, the Alberta Mental Health Board, and Public Health Works.

Police and universities in Alberta are also coordinating to collect and provide information on the drug use of arrestees. The Edmonton Police Service recently partnered with the Edmonton site of the Canadian Community Epidemiology Network on Drug Use (coordinated by the University of Alberta) to monitor the alcohol and drug use of arrestees.

The third priority in the Alberta response to methamphetamine was to provide research and information. As such, the Alberta Alcohol and Drug Abuse Commission developed a number of print and web-based resources for parents, teachers, clinicians, and other members of the public. These resources, available from www.aadac.com, included "Understanding and Responding to Crystal Meth", "Guidelines for Treating Users of Methamphetamine", and "Crystal Meth and Youth". The Alberta Alcohol and Drug Abuse Commission also partnered with the Canadian Centre on Substance Abuse and Health Canada to conduct research that included a national prevalence study and a social and economic cost study. Alberta is also attempting to update its statistics on provincial methamphetamine use by re-administering the Alberta Youth Experience Survey to determine both the prevalence and patterns of drug use among students. The Alberta Alcohol and Drug Abuse Commission also provided information on how to intervene in and treat methamphetamine use by conducting workshops at national conferences on substance abuse. Lastly, a speakers' bureau is being developed to allow experts in various areas of methamphetamine research to present their research findings.

Priority four in the Alberta response to methamphetamine involved the provision of a continuum of services. As an example, within 50 communities, the Alberta Alcohol and Drug Abuse Commission and their funded services provided outpatient counseling, crisis services, detoxification, residential programs, and shelters. The Alberta Alcohol and Drug Abuse Commission also worked with family care physicians in the nine health regions of Alberta to provide addiction services and professional training. Services were also provided in the form of a comprehensive school strategy. The purpose of the school strategy was to provide accurate information on methamphetamine. The strategy included the provision of in-school addictions counselors. As mentioned above, the Alberta Alcohol and Drug Abuse Commission also collaborated with Alberta university students to facilitate school presentations by medical residents and pharmacy students on the dangers of methamphetamine.

With respect to the provision of treatment services, detoxification services and residential treatment beds were put in place specifically for methamphetamine users. For instance, protocols stipulated that youth may stay in treatment for up to one year. Given

this, the number of treatment beds was increased in both northern and southern Alberta. Treatment programs to work specifically with young offenders were also developed. The Bridges program in Edmonton allowed male young offenders, who have addictions and mental health issues, to receive treatment. A similar program for females, the Excel Discovery program, has been developed. In terms of prevention strategies, the Alberta Alcohol and Drug Abuse Commission focused on the family, school, and community, with particular attention paid to children, youth, and young adults.

In coordinating services, focus has also been placed on developing protocols and guidelines for first responders to methamphetamine-related incidents. For instance, provincial protocols and guidelines exist for those who attend methamphetamine labs in order to increase awareness of hazards and the procedures by which to clean the site safely.

The fifth and final priority in the Alberta response to methamphetamine involved legislation and regulation. Alberta took steps to introduce protocols stipulating strategies with which to deal with children endangered by methamphetamine. For instance, in 2006, the *Drug Endangered Children Act* was introduced, providing the police with an ability to charge parents who endangered their children through exposure to drug production or trafficking. This act is not specific to methamphetamine labs as it also applies to the exposure of children to marijuana grow operations. Alberta has also included drug-endangered children protocols in their training and integrated drug-endangered children concepts into their Child at Risk Response Teams in Edmonton and Calgary. A second 2006 act, the *Protection of Children Abusing Drugs Act*, allowed for parents to place their children, if under age 18 years old, in mandatory detoxification and assessment programs.

The fifth priority also included a focus on the supply of methamphetamine. In 2006, the National Association of Pharmacy Regulatory Authorities limited access to non-prescription medications. With these new rules, stores without onsite pharmacies were prohibited from selling cold and allergy medications containing ingredients commonly used in the production of methamphetamine, such as ephedrine or pseudoephedrine. The Alberta government has also reclassified pseudoephedrine as a Schedule II drug, thereby restricting its availability. In 2004, the Alberta College of Pharmacists stipulated that products containing ephedrine or pseudoephedrine would be kept 'behind the counter' and sales would be limited to single transactions of a maximum of 400 mg for ephedrine and 3600 mg for pseudoephedrine.

Alberta has also recognized the benefits of diverting non-violent drug users out of the traditional court system. In 2005, the Edmonton Drug Treatment and Restoration Court began operating. This court allowed non-violent offenders to partake in the Alberta Alcohol and Drug Abuse Commission treatment programs as an alternative to incarceration.

The Alberta Drug Strategy, while paying particular attention to the specific issues related to methamphetamine, provided a comprehensive strategy to respond to alcohol and other drug issues. By integrating the community with the government, industry, and other stakeholders, the Alberta strategy

provided a coordinated response to the problem of methamphetamine.

Manitoba[403]

The province of Manitoba has also developed a strategy to respond to methamphetamine. In 2005, a public education campaign was promoted to raise awareness regarding crystal methamphetamine; in 2006, community forums were held. In 2006, protocols were also developed for first responders to methamphetamine-related incidents. For example, front-line workers and police were trained in how to deal with crystal methamphetamine and crystal methamphetamine takedown protocols were developed and implemented. Manitoba is also developing a protocol to encourage coordination between the multiple agencies involved in a methamphetamine lab takedown. Similarly, protocols are being developed to deal with endangered children. Child and Family Services in Manitoba is developing protocols to be followed with children and youth who are either found at the scene of a methamphetamine lab or who are addicted to methamphetamine. According to this protocol, staff with Children and Family Services would assess children found in methamphetamine labs to determine their immediate needs. Depending on the situation, a medical examination and/or toxicology screen may also be ordered. When Child and Family Services are dealing with youth who are addicted to methamphetamine, staff would assess the child's intervention needs and may refer them to treatment, or additional services, such as housing, counseling, or education.

In 2004, the Addictions Agencies Network was established by Manitoba Healthy Living in order to provide integration between programs and agencies. However, the need for an integrated and coordinated response to methamphetamine was identified in 2005. The Manitoba approach focuses on integrating provincial and international partners to reduce the supply and demand for crystal methamphetamine. Manitoba has developed a Meth Task Force, including both provincial and federal representatives, as well as representatives from law enforcement and other community agencies.

The integrated response to methamphetamine involves the coordination of front line workers. Given this, training for individuals, such as pharmacists, mental health workers, child and family services staff, and addictions workers, will be undertaken. Training focuses on outreach and motivational interviewing. Given that methamphetamine users often have a range of other mental health issues, the importance of integrating addictions and mental health services cannot be understated. As a result, Manitoba is devising a strategy to deal specifically with addiction to crystal methamphetamine. The integration of services also involves the provision of support to families dealing with a family member using crystal methamphetamine. In addition, short-term service provisions included mobile crisis units that provide community intervention, community-based crisis-stabilization units (mental health interventions for those not needing hospitalization), and crisis lines that provide both support and referrals.

Police initiatives included the development of an RCMP Synthetic Drug Coordinator. This position involves the provision of information and resources on synthetic drugs and the coordination of investigations on the production of crystal methamphetamine. The

RCMP has provided information available to the public on ways to recognize suspicious activities and potential clandestine labs.[e] In addition, the Winnipeg Police Services also attempted to increase public knowledge about the dangers of methamphetamine by providing information on clandestine labs, their potential dangers, their ability to cause environmental damage, child endangerment, and how to recognize signs of a clandestine lab.[f] In addition to training their own staff regarding the effects of crystal methamphetamine, the Winnipeg Police Service also offers training information to service providers, schools, and individuals. Similarly, the RCMP provides training in conjunction with partner agencies, such as First Responders, Natural Resources Officers, and Manitoba Hydro.

Manitoba has also passed legislation dealing with methamphetamine-related activities. The *Safer Communities and Neighbourhoods Act* of 2002 provided for the closure of properties taking part in disruptive activities. This act has been amended to apply to the illegal production of drugs, allowing the government to shut down properties in which clandestine methamphetamine labs operate.

The Manitoba government also took steps to limit the availability of some of the ingredients used in methamphetamine production. For instance, anhydrous ammonia is a fertilizer often used by farmers and which may be stolen for use in producing methamphetamine. Amendments have been made to the *Prescribed Spraying Equipment and Controlled Products Regulation* requiring the immediate notification of authorities of any missing materials, such as ammonia. Education regarding the potential for illegal use of anhydrous ammonia was also undertaken with fertilizer distributors. In addition, farmers and other residents of rural areas were the focus of education campaigns to improve levels of awareness about the need to safeguard anhydrous ammonia. In conjunction with this education campaign, a brochure, called Safeguard Your Supply of Anhydrous Ammonia, was developed to provide instructions and tips on how to protect supplies of this fertilizer, how to recognize when it has been stolen, and how to report the theft. The brochure was distributed through the Farmers Independent Weekly, a newspaper for farmers in Manitoba.

Manitoba has also attempted to reduce the demand for methamphetamine by engaging in multiple public awareness campaigns. The Crystal Meth Public Awareness Committee assisted in the development of a public awareness campaign using advertisements on television, in transit shelters, on radios, and in community forums to disseminate information about methamphetamine. In addition, a brochure was developed as part of this campaign.

Manitoba has also recently received funding to operate a drug court. This court began operation in Winnipeg in 2006. As mentioned above, this court targets non-violent offenders with substance addictions. These offenders can receive a range of community support and treatment services as opposed to incarceration.

---

[e] This information is available on the RCMP website, at http://www.rcmp.grc.ca/mb/index_e.htm

[f] This information is available on the Winnipeg Police website, at http://www.winnipeg.ca/police/default.stm

Tennessee[404]

Many American states also devised responses to methamphetamine use. The state of Tennessee recognized in 2004 that methamphetamine use and production was becoming more prevalent and, as a result, the Governor established the Governor's Task Force on Methamphetamine Abuse. The Task Force included law enforcement, government, health care, and retail representatives. The Task Force, through community meetings and public hearings involving expert testimony, produced a series of recommendations in the areas of prevention, enforcement, and community. These recommendations included: increasing the funding for methamphetamine treatment, particularly long-term initiatives; educating communities regarding the dangers of methamphetamine abuse; creating new penalties, as well as strengthening existing ones, for methamphetamine-related crimes; committing resources to help methamphetamine-endangered children; limiting precursor ingredients; addressing environmental contamination by clandestine labs; and improving federal, state, and local stakeholder coordination.

The Task Force emphasized the need for long-term treatment initiatives. Presented with evidence that the brain functioning of methamphetamine abusers did not return to normal levels for at least 12 months following methamphetamine abuse, the Task Force recommended the use of residential treatment programs. Specifically, the Task Force referred to the possibility of implementing a residential drug court in order to provide intense monitoring over the recovery of non-violent methamphetamine abusing offenders. This program would also allow for the process of recovery to be studied which could be used in improving the services provided to methamphetamine offenders in the future.

The Task Force also acknowledged the need to improve public awareness. To do so, they recommended the implementation of a public awareness campaign using videos, posters, public-service announcements, billboard advertisements, and informational brochures. Particular emphasis was placed on the promotion of awareness in elementary, middle, and high school through the provision of educational materials and messages.

The Tennessee Task Force also provided some specific recommendations regarding the contamination produced by methamphetamine labs. In recognizing the degree of contamination commonly caused by methamphetamine production, the Task Force encouraged the development of "decontamination standards" that set safe levels for subsequent use of the property. In addition, the Task Force recommended that policies should be developed stipulating the process of clean-up and remediation. Furthermore, the Task Force encouraged the development of a statewide registry of locations of known former methamphetamine labs. Presumably, this would allow for the public to have relatively easy access to information that could protect their health. They also recommended the development of a statewide registry containing the names of those convicted of manufacturing methamphetamine.

Michigan[405]

The state of Michigan recognized that it faced a growing methamphetamine problem and, in a desire to prevent the problem from becoming an epidemic, introduced several strategies. Their strategic approach was built

around six priorities: (1) law enforcement; (2) the environment; (3) media and public awareness; (4) prevention and treatment; (5) prosecutorial and judicial options; and (6) the retail industry.

There were several goals under the law enforcement priority. These included: to limit the availability of anhydrous ammonia in order to prevent its use in production of methamphetamine; to train others in the recognition of methamphetamine and how to deal with it; to provide overtime when necessary to respond to a methamphetamine lab investigation and clean-up; to work with legal representatives of the criminal justice system to hold offenders accountable; to provide a tip-line to keep the public involved in the fight against methamphetamine; and to encourage cooperation between health, safety, and enforcement fields.

Similarly, the environmental priority established a number of goals. For instance, one environmental goal was to conduct research to better understand the environmental impact that methamphetamine labs can have. Other goals included the identification of the particular clean-up issues involved both inside and around methamphetamine labs. In addition, by reviewing the Michigan Health Code, they looked for rules that could target property owners to hold them responsible for lab clean-up. They are also attempting to create standards for remediation of methamphetamine labs. Finally, the development of a notification system for environmental and health agency staff is also underway.

Media and public awareness goals emphasized the need to educate the public on the dangers posed by methamphetamine. For instance, press conferences, press releases, public service announcements, and advertisement campaigns targeted the general public. More specific sub-groups, such as health, social services, and law enforcement, were also targeted in a variety of awareness campaigns. Similarly, specific areas in which methamphetamine was a particular problem were also being considered for anti-methamphetamine messages. The media was also used to promote awareness regarding the policies and activities of methamphetamine task forces. Finally, a website will become available to allow interested individuals to find current information and resources.

The goals established under the prevention and treatment priority involved the collection of baseline information, such as the extent of child abuse and neglect related to caregiver methamphetamine use. Research is also being conducted to identify effective interventions and to provide specific treatment protocols for methamphetamine. Development of an early warning system is also underway to allow communities to recognize and share information on emerging methamphetamine-related issues.

The prosecutorial and judicial goals included an attempt to increase the penalties associated with methamphetamine-related activities. Sentencing guidelines were reviewed to determine how to best improve penalties. There was also ongoing education and awareness among other members of the criminal justice system, such as probation and parole officers, to ensure that they were knowledgeable regarding methamphetamine. A final goal included the establishment of protocols for evidence collection, preservation, and testing procedures.

The retail priority involved a focus on the products used in methamphetamine production. In order to assist retailers in reducing access to the ingredients associated with the production of methamphetamine, the patterns and practices of both methamphetamine users and producers were studied to determine how they related to retail practices. An additional goal includes the use of UPC and other identifiers to flag those products used to produce methamphetamine. With respect to anhydrous ammonia, there was a move to toughen the penalties applicable to its illegal possession, and the promotion of methods to identify the tanks themselves. Finally, the hospitality industry was also included in the retail priorities as one goal included the promotion of awareness among motel and hotel owners and employees because methamphetamine labs could easily be set up inside motel and hotel rooms.

The Michigan State Police became certified in responding to clandestine labs through the completion of 40 hours of training. In addition, training regarding clandestine labs was integrated into police academies and police first aid instructors receive three hours of methamphetamine-specific training. The police also provide methamphetamine awareness training to fire officials and fire fighters, as well as other emergency medical personnel, and agriculture and health care professionals. All state police and fire departments in Michigan also received a video on methamphetamine awareness.

Michigan has also integrated the community in its attempts to prevent methamphetamine production and use. The police established a toll-free tip line for community members to report methamphetamine activities. The police also provide public information packets to local retail and hospitality businesses to increase awareness of methamphetamine. In attempts to raise awareness among specific community groups, bulletins on clandestine labs were mailed to public safety representatives, while farmers and others involved in agricultural activities were targeted by marketing and awareness campaigns to raise awareness regarding the use of anhydrous ammonia in methamphetamine production. Locks for anhydrous ammonia tanks were also provided to dealers and farmers in counties where methamphetamine production is a particular problem.

The ability of law enforcement to prevent the spread of methamphetamine use and production has been bolstered with increased funding. For example, in 2002, methamphetamine enforcement in southwest Michigan received a $250,000 grant. A response team specific to methamphetamine was developed, while a multi-agency task force was created to respond to the importation and distribution of pseudoephedrine. In addition, a Clandestine Laboratory Enforcement Team has been assigned specifically to investigate and take down clandestine labs. The state of Michigan has also passed legislation toughening the penalties applicable to methamphetamine-related charges.

Recommendations

The review of the literature revealed a number of best practices currently operating in several jurisdictions. These practices can be applied to cities everywhere. Based on a review of this existing literature, the authors identified several areas in which recommendations can be made.

1. Awareness Campaigns

- Target awareness and education campaigns at those who may accidentally come into contact with methamphetamine waste (i.e. chemical dumps), such as children, housing employees, sanitation employees, park employees, or construction workers;
- Target awareness campaigns at specific sub-groups who may come into contact with methamphetamine production or use, including:
    - Hotel/Motel/Gas station employees;
    - Retailers of precursor chemicals;
    - Retailers of anhydrous ammonia;
    - Pharmacists;
    - Farmers;
    - School educators;
    - School children;
    - Parents; and
    - Health care workers (nurses, physicians, mental health);
- Awareness and education campaigns should include, but not be limited to, the use of public forums, school presentations, speaker's bureaus, newsletters, posters, media advertising, campaigns run in partnership with media organizations, and/or conferences;
- Prior to implementing an awareness campaign, research should be conducted to determine what methods have been evaluated and found to be most effective;
- To determine whether the campaign is effective in achieving its goals, levels of awareness should be assessed both before and after the implementation of any campaign;
- Awareness campaigns should emphasize that methamphetamine is not an individual problem, but a community problem;
- To accommodate increased awareness of methamphetamine among the community, a toll-free tip-line should be provided to allow the public to anonymously report suspicious activities related to methamphetamine;
- To accommodate increased awareness of methamphetamine among the community, a toll-free information line should be set up to answer any questions related to methamphetamine;
- To increase the public's awareness regarding the purchasing of property formerly used for methamphetamine production, a database of condemned housing and locations of former methamphetamine labs should be developed and made publicly available.

2. Access to Materials

- The effectiveness of GloTell should be researched and, if found effective, its use should be implemented in rural areas;
- In rural areas where ammonia is commonly used, the use of locks or tamper tags on ammonia tankers should be made mandatory;
- Given that retailers of precursor chemicals, such as ephedrine and pseudoephedrine, can access valuable information, such as the license information of those buying large amounts of chemicals, enforcement officials should establish strong

working relationships with retailers of precursor chemicals.

3. Partnerships

- To increase awareness, knowledge, and access to resources, partnerships must be established between ministries and local community agencies, such as those related to public safety, children and families, education, the criminal justice system, health, housing, and the environment;
- If no integrated response team to methamphetamine exists, one should be established;
- Train-the-trainer sessions should be used to train first-responders on methamphetamine-related situations;
- Options for cost-sharing among ministries and community agencies should be identified.

4. Children

- Drug-endangered children teams should be developed with specific protocols outlining the contribution of each agency and each member of the team;
- These protocols should be re-evaluated, at a minimum, every five years;
- Drug-endangered children team representatives should be sent to view current drug-endangered children units already operating, for example, in Alberta, Seattle, or California.

5. Housing

- Where possible, bylaw legislation should be introduced to allow for cities to seize control of properties contaminated by methamphetamine;
- After reviewing a range of factors, such as zoning laws, community needs, and the availability of services and transportation, consideration should be given to decontaminating properties and developing them into public housing, for example, for use with at-risk groups such as street-youth, the homeless, or vulnerable seniors, or for use with inpatient treatment or as shelters;
- Protocols for decontamination should be reviewed and guidelines identifying which companies can be used and who is responsible for the cost should be developed.

6. Assessment of the Problem

- To develop a better understanding of both abuse and the production of methamphetamine, users and producers should be identified and interviewed;
- To develop a better understanding of the challenges related to methamphetamine, information on the use and production of methamphetamine (e.g. the location and size of methamphetamine labs) should be collected and incorporated into a shared database;
- To gather information for the database, brief forms to be used by hospitals, police, and prison regarding methamphetamine use and production should be developed and implemented.

7. Program Evaluation

- To determine effectiveness, programs (e.g. prevention, treatment) must be evaluated;
- Guidelines establishing program determinants for success, such as harm reduction or abstinence, should be identified;
- Programs must be evaluated by independent contractors for the results to be seen as valid;
- Evaluations should consider whether programs are consistently implemented across time and

location, and whether they provide long-term community support.

8. Areas for Research

- *Public Awareness*: prior to implementing public awareness campaigns, research must be conducted to determine existing levels of methamphetamine awareness among, for example:
  - Educators;
  - School nurses;
  - Physicians;
  - Youth;
  - Hospitals and other front line workers; and
  - Parents.

- *Program Evaluation*: to ensure programs meet the needs of citizens, evaluations must ask, for example:
  - What programs are currently operating?;
  - Have they been evaluated?;
  - Who conducted the evaluation and what was the evaluation methodology?;
  - Did the results suggest success?; and
  - How can existing programs be improved?

- *Drug Courts*: drug courts provide alternatives to incarceration for non-violent offenders, but whether they are successful for methamphetamine users has not yet been validated:
  - How well are drug courts responding to and working with methamphetamine users?
  - Are methamphetamine users getting the treatment they need in their local communities?
  - What are the main reasons that methamphetamine users fail to successfully complete drug court programs?

- *Drug Endangered Children*:
  - What are the school policies with respect to children who use or are suspected of using methamphetamines?
  - What are the school policies with respect to children who are suspected of living in methamphetamine-contaminated housing?
  - What is the current level of information sharing among those responding to methamphetamine labs?
  - How are children taken from methamphetamine labs currently dealt with?

Conclusion

Corporal Scott Rintoul of the Royal Canadian Mounted police contended that enforcement cannot be the only approach used to respond to the challenges posed by methamphetamine:

"[t]he RCMP believes that enforcement alone will not reduce the supply or demand for drugs. We believe that a reduction in the supply and a demand for drugs will only happen if prevention (awareness, education) and treatment are given the same priorities as enforcement".[406]

As identified in Alberta's recent drug strategy, most governmental and non-governmental agencies that deal with methamphetamine focused their prevention and treatment efforts on the larger context of drug use. This approach is important because the reasons for drug addiction are often similar and many drug users are poly-substance users. However, it must be recognized that amphetamines differ from other drugs in several important ways. The nature and ease of their production facilitates their spread across jurisdictions. The ability of methamphetamine to assist in weight loss, maintaining attention, and increased productivity makes it an attractive choice to many who are not aware of the extreme consequences or the ease with which they can become addicted to this drug. Although methamphetamine is not the primary drug of choice for many children and youth, they may try methamphetamine without being aware that they are consuming it, and the introduction of "candy meth" in the United States is likely to spread to Western Canada in much the same way that methamphetamine itself originally moved north.

Methamphetamine threatens not only those who are directly involved with its production and use, but also the larger community. Community members are at risk of physical harm from chemical contamination of the water, air, and land that can occur when methamphetamine by-products are dumped. People are also at risk of physical harm from potential explosions that could occur during the production of methamphetamine or from being injured or killed from those under the influence of methamphetamine. Front line workers, such as child care workers, emergency medical staff, fire fighters, and police officers, are also at risk for chemical contamination when they unknowingly enter a methamphetamine lab. They are also at risk for violence at the hands of a methamphetamine user who is high. Lastly, children are placed in harm's way when their parents use or produce methamphetamine. Birth defects result from the use of methamphetamine while pregnant, while children who grow up with methamphetamine using parents often suffer both short-term (abuse, neglect) and long-term (developmental delays, criminality) damage. Children are also at risk of physical harm when they live with caregivers who produce methamphetamine. They are at an increased risk for stepping on needles, of becoming chemically contaminated, and of being physically, sexually, and psychologically abused, or neglected. In fact, according to the former United States Attorney General Alberto Gonzalez,

"*[i]n terms of damage to children and to our society, meth is now the most dangerous drug in America*". [407]

Methamphetamine is a drug unlike any other. It presents unique challenges not readily seen with other drug use. Its long-term

consequences remain unknown. While it appears that some of the effects of methamphetamine can be reduced after years of abstinence, some motor and mental functions seem more resistant to recovery. The very nature of treatment itself, while based on the same general concepts as other drug treatments, must take into consideration the unique, multi-problem profile of methamphetamine abusers. Short-term inpatient care may be necessary for the user to detoxify; however, long-term community support is critical to assist methamphetamine users from relapsing.

Worldwide, communities have recognized the unique challenges and problems posed by methamphetamine use and production, and have responded with policies, programs, and practices that are both creative and effective. Currently, the use and production of methamphetamine in communities varies; some communities are experiencing an epidemic of production and use, while, in other communities, methamphetamine-related problems are growing. Although some communities have yet to experience a problem with methamphetamine use or production, regardless of the extent of the problem, there is a consensus that methamphetamine is a serious drug that has significant negative personal, familial, community, and society wide consequences. Given this, it is essential that communities develop collaborative approaches to prevent and intervene in the many developmental, familial, social, environmental, and economic challenges and dangers posed by methamphetamine use and production.

Appendix A: Chemicals used in the Production of Methamphetamine [408]

Chemical	Hazards
Pseudoephedrine	Ingestion of doses greater than 240 mg causes hypertension, arrhythmia, anxiety, dizziness, and vomiting. Ingestion of doses greater than 600 mg can lead to renal failure and seizures.
Acetone / Ethyl Alcohol	Extremely flammable, posing a fire risk in and around the laboratory. Inhalation or ingestion of these solvents causes severe gastric irritation, narcosis, or coma.
Freon	Inhalation can cause sudden cardiac death or severe lung damage. It is corrosive if ingested.
Anhydrous Ammonia	A colorless gas with a pungent, suffocating odor. Inhalation causes edema of the respiratory tract and asphyxia. Contact with vapors damages eyes and mucous membranes.
Red Phosphorous	May explode on contact or friction. Ignites if heated above 260°C. Vapor from ignited phosphorous severely irritates the nose, throat, lungs, and eyes.
Hypophosphorous Acid	Extremely dangerous substitute for red phosphorous. If overheated, deadly phosphine gas is released. Poses a serious fire and explosion hazard.
Lithium Metal	Extremely caustic to all body tissues. Reacts violently with water and poses a fire or explosion hazard.
Hydriodic Acid	A corrosive acid with vapors that are irritating to the respiratory system, eyes, and skin. If ingested, causes severe internal irritation and damage that may cause death.
Iodine Crystals	Give off vapor that is irritating to the respiratory system and eyes. Solid form irritates the eyes and may burn skin. If ingested, causes severe internal damage.
Phenylpropanolamine	Ingestion of doses greater than 75 mg causes hypertension, arrhythmia, anxiety, and dizziness. Quantities greater than 300 mg can lead to renal failure, seizures, stroke, and death.

Appendix B: Resources for Methamphetamine Prevention

Methamphetamine Prevention Resources			
Title	***Description***	***Cost***	***Website***
Dying for Meth	40-minute DVD for use with students, community groups, law enforcement, government agencies. Promotes an anti-meth message in an entertaining and informative way	$150 (US)	http://www.dyingformeth.com/
The Meth Epidemic	Hour long documentary discussing the history and spread of meth, the effects of meth, and attempts to regulate the ingredients. Can also be viewed online.	$29.99 (US)	http://www.pbs.org/wgbh/pages/frontline/meth/
Crystal Misery	22-minute DVD produced by the Washington County Sheriff's Office. Designed to help prevent youth from using MA. Uses real-life experiences to describe the impact of MA. Can also download posters with anti-meth messages.	$15 (US)	http://www.co.washington.or.us/sheriff/investig/crystal2/misery.htm
Methamphetamine: A Prevention Trilogy	Three award winning DVDs on meth: "Meth…The Great Deceiver" (17 minutes), "Where Meth Goes, Violence and Destruction Follow" (18 minutes), and "Hidden Dangers: Meth Labs" (18 minutes). Produced by the California Department of Justice, the videos present information on how meth can damage lives and tips for recognizing and responding to meth labs.	N/A	Contact wendy.tully@doj.ca.gov.
Meth: A County in Crisis	An A&E-produced television documentary on a community in Missouri affected by meth.	N/A	homevideo@AandE.com
Faces of Meth	A CD with 59 before-and-after images of inmates with a history of meth use. Produced by Multnomah County Sheriff's Office.		http://www.facesofmeth.us/
Meth Destroys	A 20-minute DVD focusing on the meth problem in Tennessee. Includes stories with four former meth addicts. Website also offers posters, teachers guide, and brochures.		http://www.methfreetn.org/

References

[1] No author. (Tuesday, March 28 2006). Deadly rush: The menace of crystal meth. *Chilliwack Times*. Pages B1-B8.

[2] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[3] *Ibid.*

[4] *Ibid,* p. 46.

[5] Yang, P., Huang, E., Yeh, G., & Tao, P. (2006). Co-administration of dextromethorphan with methamphetamine attenuates methamphetamine-induced rewarding and behavioral sensitization. *Journal of Biomedical Science, 13*: 695-702.

[6] Dyer, K. & Cruickshank, C. (2005). Depression and other psychological health problems among methamphetamine dependent patients in treatment: Implications for assessment and treatment outcome. *Australian Psychologist, 40*(2): 96-108.

[7] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[8] Dyer, K. & Cruickshank, C. (2005). Depression and other psychological health problems among methamphetamine dependent patients in treatment: Implications for assessment and treatment outcome. *Australian Psychologist, 40*(2): 96-108.

[9] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[10] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[11] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[12] Booth, B., Leukefeld, C., Falck, R., Wang, J., & Carlson, R. (2006). Correlates of rural methamphetamine and cocaine users: Results from a multistate community study. *Journal of Studies on Alcohol, 67*: 493-501.

[13] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[14] No author. (Tuesday, March 28 2006). Deadly rush: The menace of crystal meth. *Chilliwack Times*. Pages B1-B8.

[15] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[16] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[17] Substance information link. (2004). *Fact Sheet: Methamphetamine*. BC Partners for Mental Health and Addictions Information: Vancouver.

[18] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[19] Booth, B., Leukefeld, C., Falck, R., Wang, J., & Carlson, R. (2006). Correlates of rural methamphetamine and cocaine users: Results from a multistate community study. *Journal of Studies on Alcohol, 67*: 493-501.

[20] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[21] Martin, I., Lampinen, T., & McGhee, D. (2006). Methamphetamine use among marginalized youth in British Columbia. *Canadian Journal of Public Health, 97*(4): 320-324.

[22] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[23] National Association of State Alcohol and Drug Abuse Directors. (June 12, 2006). ONDCP highlights meth, prescription drug control in strategy document. *Alcoholism & Drug Abuse Weekly*, *18*(24).

[24] National Association of State Alcohol and Drug Abuse Directors. (July 18, 2005). Mothers addicted to meth face losing their children; Crisis looms in child welfare systems. *Alcoholism & Drug Abuse Weekly, 17*(27).

[25] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[26] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[27] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[28] Waterhouse, T. (2007). Rates of methamphetamine use in B.C. schools. *Personal communication.* More information available through the Institute for Safe Schools of British Columbia at www.iss-bc.ca.

[29] Martin, I., Lampinen, T., & McGhee, D. (2006). Methamphetamine use among marginalized youth in British Columbia. *Canadian Journal of Public Health, 97*(4): 320-324.

[30] Saskatchewan Health. (2004). *A Strategic Plan for Crystal Meth and Other Amphetamines in Saskatchewan.* Accessed January, 2007 from http://www.health.gov.sk.ca/mc_dp_crystalmeth_skstrategy.pdf.

[31] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[32] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[33] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[34] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[35] Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. *Office for Victims of Crime (OVC) Bulletin.* 1-12.

[36] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[37] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[38] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[39] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[40] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[41] Matsumoto, T., Kamijo, A., Miyakawa, T., Endo, K., Yabana, T., Kishimoto, H., Okudaira, K., Iseki, E., Sakai, T., & Kosaka, K. (2002). Methamphetamine in Japan: The consequences of methamphetamine abuse as a function of route of administration. *Addiction, 97*: 809-817.

[42] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[43] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[44] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[45] Arria, A., Derauf, C., LaGasse, L., Grant, P., Shah, R., Smith, L., Haning, W., Huestis, M., Strauss, A., Della Grotta, S., Liu, J., & Lester, B. (2006). Methamphetamine and other substance use during pregnancy: Preliminary estimates from the infant development, environment, and lifestyle (IDEAL) study. *Maternal and Child Health Journal, 10*(3): 293-302.

[46] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[47] Saskatchewan Health. (2004). *A Strategic Plan for Crystal Meth and Other Amphetamines in Saskatchewan.* Accessed January, 2007 from http://www.health.gov.sk.ca/mc_dp_crystalmeth_skstrategy.pdf.

[48] Goldblatt, A. (2004). *A Community Stakeholder View of Crystal Meth in Edmonton: Trends, Strategies, Challenges, and Needs*. Social Development Working Group of the Safer Cities Advisory Committee: Edmonton, AB.

[49] Moriarty, E. (2006). Meth abusers costs employers millions. *Atlanta Business Chronicle*. Accessed December, 2006 from http://www.bizjournals.com/atlanta/stories/2006/01/30/story3.html.

[50] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[51] Brecht, M., Greenwell, L., & Anglin, D. (2005). Methamphetamine treatment: Trends and predictors of retention and completion in a large state treatment system. *Journal of Substance Treatment, 29*: 295-306.

[52] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[53] Booth, B., Leukefeld, C., Falck, R., Wang, J., & Carlson, R. (2006). Correlates of rural methamphetamine and cocaine users: Results from a multistate community study. *Journal of Studies on Alcohol, 67*: 493-501.

[54] Brecht, M., Greenwell, L., & Anglin, D. (2005). Methamphetamine treatment: Trends and predictors of retention and completion in a large state treatment system. *Journal of Substance Treatment, 29*: 295-306.

[55] Goldblatt, A. (2004). *A Community Stakeholder View of Crystal Meth in Edmonton: Trends, Strategies, Challenges, and Needs*. Social Development Working Group of the Safer Cities Advisory Committee: Edmonton, AB.

[56] National Survey on Drug Use and Health. (2007). *Methamphetamine Use*. Substance Abuse and Mental Health Services Administration. Accessed January, 2007 from http://www.oas.samhsa.gov.

[57] Vazquez, J. (2007). "Candy" meth emerges in Bay area. *CBS 5*. Accessed February, 2007 from http://cbs5.com/local/local_story_031014130.html.

[58] National Survey on Drug Use and Health. (2007). *Methamphetamine Use*. Substance Abuse and Mental Health Services Administration. Accessed January, 2007 from http://www.oas.samhsa.gov.

[59] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[60] National Survey on Drug Use and Health. (2007). *Methamphetamine Use*. Substance Abuse and Mental Health Services Administration. Accessed January, 2007 from http://www.oas.samhsa.gov.

[61] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[62] No author. (2006). *Monitoring the Future Survey 2006.* The University of Michigan. Accessed January, 2007 from http://www.monitoringthefuture.org/.

[63] Adlaf, E.M. & Paglia-Boak, A. (2005). *Drug Use Among Ontario Students: Detailed OSDUS Findings, 1997-2005.* Centre for Addictions and Mental Health, Report No. 17. Accessed January, 2007 from http://www.camh.net/Research/Areas_of_research/Population_Life_Course_Studies/OSDUS/OSDUS2005_HighlightsDrug_final.pdf.

[64] Begin, P., Weekes, J., & Thomas, G. (2006). The Canadian Addiction Survey: Substance use and misuse among the Canadian population. *Forum on Corrections Research, 18*(1): 12-18.

[65] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[66] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[67] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[68] Goldblatt, A. (2004). *A Community Stakeholder View of Crystal Meth in Edmonton: Trends, Strategies, Challenges, and Needs*. Social Development Working Group of the Safer Cities Advisory Committee: Edmonton, AB.

[69] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[70] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[71] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[72] Substance information link. (2004). *Fact Sheet: Methamphetamine*. BC Partners for Mental Health and Addictions Information: Vancouver.

[73] No author. (Tuesday, March 28 2006). Deadly rush: The menace of crystal meth. *Chilliwack Times*. Pages B1-B8.

[74] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[75] Substance information link. (2004). *Fact Sheet: Methamphetamine*. BC Partners for Mental Health and Addictions Information: Vancouver.

[76] No author. (Tuesday, March 28 2006). Deadly rush: The menace of crystal meth. *Chilliwack Times*. Pages B1-B8.

[77] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[78] No author. (2007). *Frontline: The Meth Epidemic*. Accessed January, 2007 from http://www.pbs.org/wgbh/pages/frontline/meth/.

[79] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[80] Tennessee Meth Task Force. (2004). *The Govenor's Task Force on Methamphetamine Abuse: Final Report;* p.8.

[81] No author. (2007). *Frontline: The Meth Epidemic*. Accessed January, 2007 from http://www.pbs.org/wgbh/pages/frontline/meth/.

[82] No author. (Tuesday, March 28 2006). Deadly rush: The menace of crystal meth. *Chilliwack Times*. Pages B1-B8.

[83] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[84] National Association of State Alcohol and Drug Abuse Directors. (September 20, 2004). Methamphetamine addiction support group catching on nationally. *Alcoholism & Drug Abuse Weekly, 16*(36).

[85] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[86] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[87] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[88] No author. (Tuesday, March 28 2006). Deadly rush: The menace of crystal meth. *Chilliwack Times*. Pages B1-B8.

[89] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[90] *Ibid.*

[91] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[92] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[93] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[94] No author. (Tuesday, March 28 2006). Deadly rush: The menace of crystal meth. *Chilliwack Times*. Pages B1-B8.

[95] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[96] No author. (2007). *Frontline: The Meth Epidemic*. Accessed January, 2007 from http://www.pbs.org/wgbh/pages/frontline/meth/.

[97] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[98] No author. (2007). *Frontline: The Meth Epidemic*. Accessed January, 2007 from http://www.pbs.org/wgbh/pages/frontline/meth/.

[99] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[100] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[101] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[102] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[103] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[104] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[105] National Association of State Alcohol and Drug Abuse Directors. (September 20, 2004). Methamphetamine addiction support group catching on nationally. *Alcoholism & Drug Abuse Weekly, 16*(36).

[106] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[107] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[108] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[109] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[110] Schilder, A., Lampinen, T.M., Miller, M.L., & Hogg, R.S. (2005). Crystal methamphetamine and ecstasy differ in relation to unsafe sex among young gay men. *Canadian Journal of Public Health, 96*(5): 340-343.

[111] Goldblatt, A. (2004). *A Community Stakeholder View of Crystal Meth in Edmonton: Trends, Strategies, Challenges, and Needs*. Social Development Working Group of the Safer Cities Advisory Committee: Edmonton, AB.

[112] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[113] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[114] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[115] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[116] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[117] Editorial. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65.

[118] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[119] Newton, T., Kalechstein, A., Duran, S., Vansluis, N., & Ling, W. (2004). Methamphetamine abstinence syndrome: Preliminary findings. *The American Journal on Addictions, 13*: 248-255.

[120] *Ibid.*

[121] Baker, A., & Dawe, S. (2005). Amphetamine use and co-occuring psychological problems: Review of the literature and implications for treatment. *Australian Psychologist, 40*(2): 88-95.

[122] Dyer, K. & Cruickshank, C. (2005). Depression and other psychological health problems among methamphetamine dependent patients in treatment: Implications for assessment and treatment outcome. *Australian Psychologist, 40*(2): 96-108.

[123] *Ibid.*

[124] McGregor, C., Srisurapanont, M., Jittiwutikarn, J., Laobhripatr, S., Wongtan, T., & White, J. (2005). The nature, time course, and severity of methamphetamine withdrawal. *Addiction, 100*: 1320-1329.

[125] Substance information link. (2004). *Fact Sheet: Methamphetamine*. BC Partners for Mental Health and Addictions Information: Vancouver.

[126] Brecht, M., O'Brien, A., von Mayrhauser, C., & Anglin, M. (2004). Methamphetamine use behaviors and gender differences. *Addictive Behaviors, 29*: 89-106.

[127] *This is Not a Test: 2006 Vancouver Youth Drug Survey Results*. Vancouver Coastal Health. Accessed May, 2007 from http://www.vch.ca/news/docs/2007_03_06_YouthDrugSurveyReport.pdf.

[128] Booth, B., Leukefeld, C., Falck, R., Wang, J., & Carlson, R. (2006). Correlates of rural methamphetamine and cocaine users: Results from a multistate community study. *Journal of Studies on Alcohol, 67*: 493-501.

[129] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[130] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[131] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[132] No author. (2006). *Chemical Drug Scene: An Update, June 2006.* Accessed May, 2007 from http://www.adicbc.com/publications/article_ChemicalDrugScene2006.pdf.

[133] Premier's Task Force on Crystal Meth. (2006). *Fighting Back: Report and Recommendations of the Premier's Task Force on Crystal Meth.* Accessed May, 2007 from http://www.premier.alberta.ca/cmeth/.

[134] Jobe-Armstrong, M. (2005). *A Community Guide: Strategies and Interventions for Dealing with Crystal Methamphetamine and other Emerging Drug Trends.* Prepared for the Methamphetamine Task Group of the Fraser Health Addictions Services Planning Steering Committee. Accessed November, 2006 from

http://www.fraserhealth.ca/NR/rdonlyres/euvxdbiyihnllnf4groi47atty2npz2xlbvl632nok2esuoy67zmsm3xdjrp7cgs3iuqgtteym4ncf/CMCommunityGuide.pdf

[135] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[136] Jobe-Armstrong, M. (2005). *A Community Guide: Strategies and Interventions for Dealing with Crystal Methamphetamine and other Emerging Drug Trends.* Prepared for the Methamphetamine Task Group of the Fraser Health Addictions Services Planning Steering Committee. Accessed November, 2006 from http://www.fraserhealth.ca/NR/rdonlyres/euvxdbiyihnllnf4groi47atty2npz2xlbvl632nok2esuoy67zmsm3xdjrp7cgs3iuqgtteym4ncf/CMCommunityGuide.pdf

[137] Martin, I., Lampinen, T., & McGhee, D. (2006). Methamphetamine use among marginalized youth in British Columbia. *Canadian Journal of Public Health, 97*(4): 320-324.

[138] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[139] Martin, I., Lampinen, T., & McGhee, D. (2006). Methamphetamine use among marginalized youth in British Columbia. *Canadian Journal of Public Health, 97*(4): 320-324.

[140] Schilder, A., Lampinen, T.M., Miller, M.L., & Hogg, R.S. (2005). Crystal methamphetamine and ecstasy differ in relation to unsafe sex among young gay men. *Canadian Journal of Public Health, 96*(5): 340-343.

[141] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[142] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[143] Grant, B.A. (2006). National thematic workshop on corrections: Addressing substance abuse through collaboration. *Forum on Corrections Research, 18*(1): 6-8.

[144] Begin, P., Weekes, J., & Thomas, G. (2006). The Canadian Addiction Survey: Substance use and misuse among the Canadian population. *Forum on Corrections Research, 18*(1): 12-18.

[145] Grant, B.A. (2006). National thematic workshop on corrections: Addressing substance abuse through collaboration. *Forum on Corrections Research, 18*(1): 6-8.

[146] Engler, J., Haveman, J., Yaldoo, C., & Madden, S. (2002). *Michigan Methamphetamine Control Strategy*. Accessed December, 2006 from http://www.michigan.gov/documents/MethStrategy2002_44051_7.pdf.

[147] *Ibid.*

[148] Long, C. (2006). Developing national substance abuse programs in Canadian federal corrections. *Form on Corrections Research, 18*(1): 38-41.

[149] Federal Advisory Committee. (2000). *Methamphetamine Interagency Task Force: Final Report.* Department of Justice, Executive Office of the President of the United States, Department of Health and Human Services, Department of Education. Accessed December, 2006 from http://www.ncjrs.gov/pdffiles1/nij/180155.pdf.

[150] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[151] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[152] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[153] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[154] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[155] National Association of State Alcohol and Drug Abuse Directors. (September 20, 2004). Methamphetamine addiction support group catching on nationally. *Alcoholism & Drug Abuse Weekly, 16*(36).

[156] No author. (Tuesday, March 28 2006). Deadly rush: The menace of crystal meth. *Chilliwack Times*. Pages B1-B8.

[157] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[158] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[159] Stoops, W., Tindall, M., Mateyoke-Scrivner, A., & Leukefeld, C. (2005). Methamphetamine use in nonurban and urban drug court clients. *International Journal of Offender Therapy and Comparative Criminology, 49*(3): 260-276.

[160] Editorial. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65.

[161] Altshuler, S.J. (2005). Drug-endangered children need a collaborative community response. *Child Welfare League of America*: 171-190.

[162] Danks, R., Wibbenmeyer, L., Faucher, L., Sihler, K., Kealey, P., Chang, P., Amelon, M., & Lewis, R., (2004). Methamphetamine-associated burn injuries: A retrospective analysis. *Journal of Burn Care & Rehabilitation, 25*(5): 425-429.

[163] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[164] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[165] *Ibid.*

[166] Altshuler, S.J. (2005). Drug-endangered children need a collaborative community response. *Child Welfare League of America*: 171-190.

[167] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[168] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[169] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[170] Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. *Office for Victims of Crime (OVC) Bulletin.* 1-12.

[171] *Ibid.*

[172] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[173] *Ibid.*

[174] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[175] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[176] Editorial. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65.

[177] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[178] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[179] Hooper, R. (2007). Crime: Meth makers leave costly mess. *Langley Advance.* Accessed February, 2007 from http://www.langleyadvance.com/issues07/021107/news/021107nn14.html.

[180] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[181] Editorial. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65.

[182] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[183] National Association of State Alcohol and Drug Abuse Directors. (June 23, 2003). *Alcoholism & Drug Abuse Weekly, June 23 2003*: 3-4.

[184] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[185] Brown, J.A. & Hohman, M. (2006). The impact of methamphetamine use on parenting. *Journal of Social Work Practice in the Addictions, 6*(1/2): 63-88.

[186] Arria, A., et al. (2006). Methamphetamine and other substance use during pregnancy: Preliminary estimates from the infant development, environment, and lifestyle (IDEAL) study. *Maternal and Child Health Journal, 10*(3): 293-302.

[187] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[188] National Association of State Alcohol and Drug Abuse Directors. (July 18, 2005). Mothers addicted to meth face losing their children; Crisis looms in child welfare systems. *Alcoholism & Drug Abuse Weekly, 17*(27).

[189] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[190] *Ibid.*

[191] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[192] Arria, A., et al. (2006). Methamphetamine and other substance use during pregnancy: Preliminary estimates from the infant development, environment, and lifestyle (IDEAL) study. *Maternal and Child Health Journal, 10*(3): 293-302.

[193] *Ibid.*

[194] National Association of State Alcohol and Drug Abuse Directors. (May 15, 2006). Advocates seek funding for Patriot Act's Meth Provision. *Alcoholism & Drug Abuse Weekly, May 15 2006:* 6-7.

[195] Engler, J., Haveman, J., Yaldoo, C., & Madden, S. (2002). *Michigan Methamphetamine Control Strategy*. Accessed December, 2006 from http://www.michigan.gov/documents/MethStrategy2002_44051_7.pdf.

[196] Brown, J.A. & Hohman, M. (2006). The impact of methamphetamine use on parenting. *Journal of Social Work Practice in the Addictions, 6*(1/2): 63-88.

[197] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971. (p. 958).

[198] Grella, C.E., Hser, Y., & Huang, Y. (2006). Mothers in substance abuse treatment: Differences in characteristics based on involvement with child welfare services. *Child Abuse & Neglect, 30*(1): 55-73.

[199] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971. (p. 958).

[200] *Ibid.*

[201] National Association of State Alcohol and Drug Abuse Directors. (July 18, 2005). Mothers addicted to meth face losing their children; Crisis looms in child welfare systems. *Alcoholism & Drug Abuse Weekly, 17*(27).

[202] Grella, C.E., Hser, Y., & Huang, Y. (2006). Mothers in substance abuse treatment: Differences in characteristics based on involvement with child welfare services. *Child Abuse & Neglect, 30*(1): 55-73.

[203] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[204] National Association of State Alcohol and Drug Abuse Directors. (July 18, 2005). Mothers addicted to meth face losing their children; Crisis looms in child welfare systems. *Alcoholism & Drug Abuse Weekly, 17*(27).

[205] Brown, J.A. & Hohman, M. (2006). The impact of methamphetamine use on parenting. *Journal of Social Work Practice in the Addictions, 6*(1/2): 63-88.

[206] Altshuler, S.J. (2005). Drug-endangered children need a collaborative community response. *Child Welfare League of America*: 171-190.

[207] *Ibid.*

[208] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[209] Brown, J.A. & Hohman, M. (2006). The impact of methamphetamine use on parenting. *Journal of Social Work Practice in the Addictions, 6*(1/2): 63-88.

[210] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[211] *Ibid.*

[212] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[213] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[214] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[215] Tennessee Meth Task Force. (2004). *The Govenor's Task Force on Methamphetamine Abuse: Final Report.* p.11.

[216] National Drug Intelligence Center, Chemical Precursor Committee. (2002). *Information Bulletin: Children at Risk*. U.S. Department of Justice. Accessed December, 2006 from http://www.usdoj.gov/ndic/pubs1/1466/index.htm.

[217] Altshuler, S.J. (2005). Drug-endangered children need a collaborative community response. *Child Welfare League of America*: 171-190.

[218] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[219] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[220] Brown, J.A. & Hohman, M. (2006). The impact of methamphetamine use on parenting. *Journal of Social Work Practice in the Addictions, 6*(1/2): 63-88.

[221] Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. *Office for Victims of Crime (OVC) Bulletin.* 1-12.

[222] Editorial. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65

[223] Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. *Office for Victims of Crime (OVC) Bulletin.* 1-12.

[224] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[225] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[226] Diplock, J., Kirkland, S., Malm, A., & Plecas, D. (2005). *Clandestine Drug Laboratories in British Columbia*. Report produced for the International Centre for Urban Research Studies and the University College of the Fraser Valley.

[227] Editorial. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65

[228] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[229] Haugeneder, R. (2007). Drug-house bylaw getting sharper teeth. *Goldstream Gazette*. Accessed May, 2007 from http://www.mapinc.org/drugnews/v07/n530/a09.html.

[230] Brecht, M., Greenwell, L., & Anglin, D. (2005). Methamphetamine treatment: Trends and predictors of retention and completion in a large state treatment system. *Journal of Substance Treatment, 29*: 295-306.

[231] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[232] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[233] Burgess, J. (2001). Phosphine exposure from a methamphetamine laboratory investigation. *Clincal Toxicology, 39*(2): 165-168.

[234] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[235] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[236] Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. *Office for Victims of Crime (OVC) Bulletin.* 1-12.

[237] Hannan, D. (June 2005). Meth labs: Understanding exposure hazards and associated problems. *Professional Safety, June 2005*: 24-31.

[238] *Ibid.*

[239] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[240]*Ibid*.

[241] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[242] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[243] Denehy, J. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65.

[244] No author. (2006). House passes meth bill. *NCADD Washington Report*, *9*(1): 1. Retrieved from EBSCOhost November, 2006.

[245] National Association of State Alcohol and Drug Abuse Directors. (June 12, 2006). ONDCP highlights meth, prescription drug control in strategy document. *Alcoholism & Drug Abuse Weekly*, *18*(24).

[246] Information retrieved February 2007 from the Department of Toxic Substances Control, http://www.dtsc.ca.gov/SiteCleanup/ERP/Clan_Labs.cfm#__topdoc__ and the Legislative Counsel's Digest, http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_1051-1100/ab_1078_bill_20051006_chaptered.html.

[247] Editorial. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65.

[248] No author. (2007). Meth users turning to urine to get high. *CBS 5*. Accessed February, 2007 from http://cbs5.com/topstories/topstories_story_033121028.html.

[249] Roser, M.A. (2007). In meth war, pharmacy logs go unreviewed: Ephedrine laws have helped reduce number of domestic labs, officials say. *Austin American-Statesman*. Accessed November 5, 2007 from http://www.statesman.com/news/content/news/stories/local/11/04/1104meth.html.

[250] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[251] National Association of State Alcohol and Drug Abuse Directors. (June 12, 2006). ONDCP highlights meth, prescription drug control in strategy document. *Alcoholism & Drug Abuse Weekly*, *18*(24).

[252] National Association of State Alcohol and Drug Abuse Directors. (July 18, 2005). Mothers addicted to meth face losing their children; Crisis looms in child welfare systems. *Alcoholism & Drug Abuse Weekly, 17*(27).

[253] Haight, W., Jacobsen, T., Black, J., Kingery, L., Sheridan, K., & Mulder, C. (2005). In these bleak days: Parent methamphetamine abuse and child welfare in rural Midwest. *Children and Youth Services Review, 27*: 949-971.

[254] National Association of State Alcohol and Drug Abuse Directors. (June 12, 2006). ONDCP highlights meth, prescription drug control in strategy document. *Alcoholism & Drug Abuse Weekly*, *18*(24).

[255] National Drug Intelligence Center, Chemical Precursor Committee. (2002). *Information Bulletin: Children at Risk*. U.S. Department of Justice. Accessed December, 2006 from http://www.usdoj.gov/ndic/pubs1/1466/index.htm.

[256] *Ibid.*

[257] Altshuler, S.J. (2005). Drug-endangered children need a collaborative community response. *Child Welfare League of America*: 171-190.

[258] No author. (November 5, 2007). More Calgary children seized from grow ops. *Calgary Herald*. Accessed November 5, 2007 from http://www.canada.com/calgaryherald/news/city/story.html?id=56831323-db8b-4fd9-abbb-a910bedd7ed2.

[259] Whitten, L. (2006). Community-based treatment benefits methamphetamine abusers. *NIDA Notes, 20*(5): 4-5.

[260] National Association of State Alcohol and Drug Abuse Directors. (June 12, 2006). ONDCP highlights meth, prescription drug control in strategy document. *Alcoholism & Drug Abuse Weekly*, *18*(24).

[261] Hser, Y., Huang, D., Chou, C., Teruya, C., & Anglin, D., (2003). Longitudinal patterns of treatment utilization and outcomes among methamphetamine abusers: A growth curve modeling approach. *Journal of Drug Issues, 33*(4): 921-938.

[262] Whitten, L. (2006). Community-based treatment benefits methamphetamine abusers. *NIDA Notes, 20*(5): 4-5.

[263] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[264] International Narcotics Control Board. (2007). *Report of the International Narcotics Control Board for 2006*. United Nations: New York.

[265] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[266] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[267] Grella, C.E., Hser, Y., & Huang, Y. (2006). Mothers in substance abuse treatment: Differences in characteristics based on involvement with child welfare services. *Child Abuse & Neglect, 30*(1): 55-73.

[268] Saskatchewan Health. (2004). *A Strategic Plan for Crystal Meth and Other Amphetamines in Saskatchewan.* Accessed January, 2007 from http://www.health.gov.sk.ca/mc_dp_crystalmeth_skstrategy.pdf.

[269] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[270] Hohman, M., Oliver, R., and Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3): 373-381.

[271] Callaghan, R.C., Brands, B., Taylor, L., & Lentz, T. (2007). The clinical characteristics of adolescents reporting methamphetamine as their primary drug of choice: An examination of youth admitted to inpatient substance-abuse treatment in Northern British Columbia, Canada, 2001-2005. *Journal of Adolescent Health, 40*: 286-289.

[272] Crystal Meth Anonymous. Accessed February, 2007 from http://www.crystalmeth.org/index.php

[273] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[274] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[275] Rawson, R., Huber, A., Brethen, P., Obert, J., Gulati, V., Shoptaw, S., & Ling, W. (2002). Status of methamphetamine users 2-5 years after outpatient treatment. *Journal of Addictive Diseases, 21:* 107-119.

[276] Rawson, R., et al. (2004). A multi-site comparison of psycho-social approaches for the treatment of methamphetamine dependence. *Society for the Study of Addiction, 99:* 708-717.

[277] Rawson, R.A., Huber, A., Brethen, P., Obert, J., Gulati, V., Shoptaw, S., & Ling, W. (2002). Program helps patients reduce, discontinue methamphetamine use. *Brown University Digest of Addiction, 21*(4): 1,7.

[278] Meredith, C., Jaffe, C., Ang-Lee, K., & Saxon, A. (2005). Implications of chronic methamphetamine use: A literature review. *Harvard Review of Psychiatry, 13*(3): 141-154.

[279] Rawson, R., et al. (2004). A multi-site comparison of psycho-social approaches for the treatment of methamphetamine dependence. *Society for the Study of Addiction, 99:* 708-717.

[280] Rawson, R., Gonzales, R., Obert, J., McCann, M., & Brethen, P. (2005). Methamphetamine use among treatment-seeking adolescents in Southern California: Participant characteristics and treatment response. *Journal of Substance Abuse Treatment, 29*: 67-74.

[281] Roll, J., Huber, A., Sodano, R., Chudzynski, J., Moyneir, E., & Shoptaw, S. (2006). A comparison of five reinforcement schedules for use in contingency management-based treatemtn of methamphetamine abuse. *The Psychological Record, 56*: 67-81.

[282] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[283] Semple, S., Grant, I., & Patterson, T. (2005). Utilization of drug treatment programs by methamphetamine users: The role of social stigma. *The American Journal on Addictions, 14*: 367-380.

[284] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[285] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[286] Shoptaw, S., Klausner, J.D., Reback, C.J., Tierney, S., Stansell, J., Hare, C.B., Gibson, S., Siever, M., King, W.D., Kao, U. & Dang, J. (2006). A public health response to the methamphetamine epidemic: The implementation of contingency management to treat methamphetamine dependence. *BMI Public Health, 6*: 214-218.

[287] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[288] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[289] McKetin, R., Kelly, E., & Indig, D. (2005). Characteristics of treatment provided for amphetamine use in New South Wales, Australia. *Drug and Alcohol Review, 24: 433-436.*

[290] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[291] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[292] Ritchey, T. (2007). Treatment of methamphetamine. *Personal communication*. More information available at www.lifelineinterventions.org

[293] Dyer, K. & Cruickshank, C. (2005). Depression and other psychological health problems among methamphetamine dependent patients in treatment: Implications for assessment and treatment outcome. *Australian Psychologist, 40*(2): 96-108.

[294] *Ibid.*

[295] McKetin, R., Kelly, E., & Indig, D. (2005). Characteristics of treatment provided for amphetamine use in New South Wales, Australia. *Drug and Alcohol Review, 24: 433-436.*

[296] Brecht, M., Greenwell, L., & Anglin, D. (2005). Methamphetamine treatment: Trends and predictors of retention and completion in a large state treatment system. *Journal of Substance Treatment, 29*: 295-306.

[297] Semple, S., Grant, I., & Patterson, T. (2005). Utilization of drug treatment programs by methamphetamine users: The role of social stigma. *The American Journal on Addictions, 14*: 367-380.

[298] *Ibid.*

[299] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[300] Engler, J., Haveman, J., Yaldoo, C., & Madden, S. (2002). *Michigan Methamphetamine Control Strategy*. Accessed December, 2006 from http://www.michigan.gov/documents/MethStrategy2002_44051_7.pdf.

[301] Brecht, M., Anglin, D., & Dylan, M. (2005). Coerced treatment for methamphetamine abuse: Differential patient characteristics and outcomes. *The American Journal of Drug and Alcohol Abuse, 31:* 337-356.

[302] Hser, Y., Teruya, C., Evans, E., Longshore, D., Grella, C., & Farabee, D. (2003). Treating drug-abusing offenders: Initial findings from a five-county study on the impact of California's proposition 36 on the treatment system and patient outcomes. *Evaluation Review, 27*(5): 479-505.

[303] Saskatchewan Health. (2004). *A Strategic Plan for Crystal Meth and Other Amphetamines in Saskatchewan.* Accessed January, 2007 from http://www.health.gov.sk.ca/mc_dp_crystalmeth_skstrategy.pdf.

[304] Brecht, M., Anglin, D., & Dylan, M. (2005). Coerced treatment for methamphetamine abuse: Differential patient characteristics and outcomes. *The American Journal of Drug and Alcohol Abuse, 31:* 337-356.

[305] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[306] Sechrest, D., & Shicor, D. (2001). Determinants of graduation from a day treatment drug court in California: A preliminary study. *Journal of Drug Issues, 31*(1): 129-148.

[307] Ministry of Public Safety and Solicitor General. (April 10, 2006). B.C., Ottawa renew Vancouver Drug Court. *News Release*. Accessed February, 2007 from http://www2.news.gov.bc.ca/news_releases_2005-2009/2006PSSG0013-000411.htm.

[308] Brecht, M., Anglin, D., & Dylan, M. (2005). Coerced treatment for methamphetamine abuse: Differential patient characteristics and outcomes. *The American Journal of Drug and Alcohol Abuse, 31:* 337-356.

[309] *Ibid.*

[310] Hser, Y., Evans, E., & Huang, Y. (2005). Treatment outcomes among women and men methamphetamine abusers in California. *Journal of Substance Abuse Treatment, 28*: 77-85.

[311] *Ibid.*

[312] No author. (2006). Legislation to improve access to drug addiction treatment for pregnant and parenting women for meth addiction introduced in house and senate. *NCADD Washington Report*, *9*(6): 1. Retrieved from EBSCOhost November, 2006.

[313] National Association of State Alcohol and Drug Abuse Directors. (May 15, 2006). Advocates seek funding for Patriot Act's Meth Provision. *Alcoholism & Drug Abuse Weekly, May 15 2006:* 6-7.

[314] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[315] Grella, C.E., Hser, Y., & Huang, Y. (2006). Mothers in substance abuse treatment: Differences in characteristics based on involvement with child welfare services. *Child Abuse & Neglect, 30*(1): 55-73.

[316] *Ibid.*

[317] Cretzmeyer, M., Sarrazin, M., Huber, D., Block, R., & Hall, J. (2003). Treatment of methamphetamine abuse: Research findings and clinical directions. *Journal of Substance Abuse Treatment, 24*: 267-277.

[318] *Ibid.*

[319] Semple, S., Grant, I., & Patterson, T. (2005). Utilization of drug treatment programs by methamphetamine users: The role of social stigma. *The American Journal on Addictions, 14*: 367-380.

[320] National Institute on Drug Abuse. (2006). *National Institute on Drug Abuse Research Report – Methamphetamine Abuse and Addiction.* U.S. Department of Health and Human Services: National Institute of Health. Accessed December 2006 from http://www.nida.nih.gov/ResearchReports/Methamph/Methamph.html

[321] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf. p.21.

[322] No author. (2007). *Saint Jude Retreat House homepage*. Accessed February, 2007 from http://www.soberforever.net/six-reasons-to-choose-a-rehab-center.cfm.

[323] Goldblatt, A. (2004). *A Community Stakeholder View of Crystal Meth in Edmonton: Trends, Strategies, Challenges, and Needs*. Social Development Working Group of the Safer Cities Advisory Committee: Edmonton, AB.

[324] National Association of State Alcohol and Drug Abuse Directors. (June 6, 2005). Study shows meth damage reversible after period of abstinence. *Alcoholism & Drug Abuse Weekly, 17*(22): 4-5.

[325] Hartz, D., Frederick-Osborne, S., & Galloway, G. (2001). Craving predicts use during treatment for methamphetamine dependence: A prospective, repeated-measures, within-subject analysis. *Drug and Alcohol Dependence, 63*: 269-276.

[326] National Association of State Alcohol and Drug Abuse Directors. (June 6, 2005). Study shows meth damage reversible after period of abstinence. *Alcoholism & Drug Abuse Weekly, 17*(22): 4-5.

[327] Dyer, K. & Cruickshank, C. (2005). Depression and other psychological health problems among methamphetamine dependent patients in treatment: Implications for assessment and treatment outcome. *Australian Psychologist, 40*(2): 96-108.

[328] National Association of State Alcohol and Drug Abuse Directors. (June 6, 2005). Study shows meth damage reversible after period of abstinence. *Alcoholism & Drug Abuse Weekly, 17*(22): 4-5.

[329] Hser, Y., Huang, D., Chou, C., Teruya, C., & Anglin, D., (2003). Longitudinal patterns of treatment utilization and outcomes among methamphetamine abusers: A growth curve modeling approach. *Journal of Drug Issues, 33*(4): 921-938.

[330] National Association of State Alcohol and Drug Abuse Directors. (June 12, 2006). ONDCP highlights meth, prescription drug control in strategy document. *Alcoholism & Drug Abuse Weekly*, *18*(24).

[331] Kresina, T., Normand, J., Khalsa, J., Mitty, J., Flanigan, T., & Francis, H. (2004). Addressing the need for treatment paradigms for drug-abusing patients with multiple morbidities. *Clinical Infectious Diseases, 38* (Suppl. 5): 398-401.

[332] *Ibid.*

[333] Rawson, R., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment, 23*: 145-150.

[334] Jobe-Armstrong, M. (2005). *A Community Guide: Strategies and Interventions for Dealing with Crystal Methamphetamine and other Emerging Drug Trends.* Prepared for the Methamphetamine Task Group of the Fraser Health Addictions Services Planning Steering Committee. Accessed November, 2006 from http://www.fraserhealth.ca/NR/rdonlyres/euvxdbiyihnllnf4groi47atty2npz2xlbvl632nok2esuoy67zmsm3xdjrp7cgs3iuqgtteym4ncf/CMCommunityGuide.pdf

[335] Street Spirits Theatre Company. (2007). *Street Spirits Theatre Company homepage.* Accessed January, 2007 from www.streetspirits.com.

[336] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[337] Federal Advisory Committee. (2000). *Methamphetamine Interagency Task Force: Final Report.* Department of Justice, Executive Office of the President of the United States, Department of Health and Human Services, Department of Education. Accessed December, 2006 from http://www.ncjrs.gov/pdffiles1/nij/180155.pdf.

[338] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[339] *Ibid.*

[340] Federal Advisory Committee. (2000). *Methamphetamine Interagency Task Force: Final Report.* Department of Justice, Executive Office of the President of the United States, Department of Health and Human Services, Department of Education. Accessed December, 2006 from http://www.ncjrs.gov/pdffiles1/nij/180155.pdf.

[341] Lucas, C. (November 5, 2007). Push to turn young off using ice. Accessed November 5, 2007 from www.theage.com/au.

[342] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[343] Saskatchewan Health. (2004). *A Strategic Plan for Crystal Meth and Other Amphetamines in Saskatchewan.* Accessed January, 2007 from http://www.health.gov.sk.ca/mc_dp_crystalmeth_skstrategy.pdf.

[344] Goldblatt, A. (2004). *A Community Stakeholder View of Crystal Meth in Edmonton: Trends, Strategies, Challenges, and Needs*. Social Development Working Group of the Safer Cities Advisory Committee: Edmonton, AB.

[345] Federal Advisory Committee. (2000). *Methamphetamine Interagency Task Force: Final Report.* Department of Justice, Executive Office of the President of the United States, Department of Health and Human Services, Department of Education. Accessed December, 2006 from http://www.ncjrs.gov/pdffiles1/nij/180155.pdf.

[346] National Association of State Alcohol and Drug Abuse Directors. (June 23, 2003). *Alcoholism & Drug Abuse Weekly, June 23 2003*: 3-4.

[347] Centre for Substance Abuse Prevention. (2006). *Meth Prevention: What you and Your Community CAN Do!* Satellite Broadcast and Webcast, accessed February 2007 from http://wdh.state.wy.us/SAD/Docs/Meth/methbroadcast7_06.pdf

[348] Goldblatt, A. (2004). *A Community Stakeholder View of Crystal Meth in Edmonton: Trends, Strategies, Challenges, and Needs*. Social Development Working Group of the Safer Cities Advisory Committee: Edmonton, AB.

[349] Alberta Alcohol and Drug Abuse Commission. (2006). *Alberta Drug Strategy: Co-ordinated Alberta Response to Methamphetamine* (2nd ed.). Accessed December, 2006 from http://corp.aadac.com/content/corporate/other_drugs/coordinated_response_to_meth.pdf.

[350] Arria, A., et al. (2006). Methamphetamine and other substance use during pregnancy: Preliminary estimates from the infant development, environment, and lifestyle (IDEAL) study. *Maternal and Child Health Journal, 10*(3): 293-302.

[351] McKenna, R. (2005). *Operation: Allied Against Meth, Task Force Final Report*. Attorney General of Washington.

[352] Arria, A., et al. (2006). Methamphetamine and other substance use during pregnancy: Preliminary estimates from the infant development, environment, and lifestyle (IDEAL) study. *Maternal and Child Health Journal, 10*(3): 293-302.

[353] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73.

[354] Alberta Alcohol and Drug Abuse Commission. (2006). *Alberta Drug Strategy: Co-ordinated Alberta Response to Methamphetamine* (2nd ed.). Accessed December, 2006 from http://corp.aadac.com/content/corporate/other_drugs/coordinated_response_to_meth.pdf.

[355] Danks, R., Wibbenmeyer, L., Faucher, L., Sihler, K., Kealey, P., Chang, P., Amelon, M., & Lewis, R., (2004). Methamphetamine-associated burn injuries: A retrospective analysis. *Journal of Burn Care & Rehabilitation, 25*(5): 425-429.

[356] *Ibid.*

[357] Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. *Office for Victims of Crime (OVC) Bulletin.* 1-12.

[358] Altshuler, S.J. (2005). Drug-endangered children need a collaborative community response. *Child Welfare League of America*: 171-190.

[359] National Drug Intelligence Center, Chemical Precursor Committee. (2002). *Information Bulletin: Children at Risk*. U.S. Department of Justice. Accessed December, 2006 from http://www.usdoj.gov/ndic/pubs1/1466/index.htm.

[360] Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. *Office for Victims of Crime (OVC) Bulletin.* 1-12.

[361] McKenna, R. (2005). *Operation: Allied Against Meth, Task Force Final Report*. Attorney General of Washington.

[362] Lineberry, T.W., & Bostwick, J.M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1): 77-84.

[363] Editorial. (2006). The meth epidemic: Its effect on children and communities. *The Journal of School Nursing, 22*(2): 63-65.

[364] Loyie, F. (2007). Drug endangered children act gives police tool to halt abuse. *The Edmonton Journal.* Accessed February, 2007 from

http://www.canada.com/edmontonjournal/news/cityplus/story.html?id=9875a2a6-fd66-465d-9e31-d242fe791267.

[365] McKenna, R. (2005). *Operation: Allied Against Meth, Task Force Final Report*. Attorney General of Washington.

[366] Centre for Substance Abuse Prevention. (2006). *Meth Prevention: What you and Your Community CAN Do!* Satellite Broadcast and Webcast, accessed February 2007 from http://wdh.state.wy.us/SAD/Docs/Meth/methbroadcast7_06.pdf

[367] *Ibid.*

[368] No author. (2007). Meth users turning to urine to get high. *CBS 5*. Accessed February, 2007 from http://cbs5.com/topstories/topstories_story_033121028.html.

[369] Drug Enforcement Agency. (2007). *Methamphetamine*. Accessed May, 2007 from http://www.dea.gov/concern/18862/meth.htm.

[370] Premier's Task Force on Crystal Meth. (2006). *Fighting Back: Report and Recommendations of the Premier's Task Force on Crystal Meth.* Accessed May, 2007 from http://www.premier.alberta.ca/cmeth/.

[371] *Ibid*.

[372] Centre for Substance Abuse Prevention. (2006). *Meth Prevention: What you and Your Community CAN Do!* Satellite Broadcast and Webcast, accessed February 2007 from http://wdh.state.wy.us/SAD/Docs/Meth/methbroadcast7_06.pdf

[373] McKenna, R. (2005). *Operation: Allied Against Meth, Task Force Final Report*. Attorney General of Washington.

[374] *Ibid.*

[375] *Ibid.*

[376] McDaniel, R. (2004). Solving the meth problem: The Wyoming plan. *Spectrum: Journal of State Government*: 33-34.

[377] Rawson, R. (2000). Drug court practioner fact sheet. *National Drug Court Institute.* Accessed February, 2007 from http://www.ndci.org/publications/methamphetamine_factsheet.pdf.

[378] Grella, C.E., Hser, Y., & Huang, Y. (2006). Mothers in substance abuse treatment: Differences in characteristics based on involvement with child welfare services. *Child Abuse & Neglect, 30*(1): 55-73.

[379] Semple, S., Grant, I., & Patterson, T. (2005). Utilization of drug treatment programs by methamphetamine users: The role of social stigma. *The American Journal on Addictions, 14*: 367-380.

[380] McDaniel, R. (2004). Solving the meth problem: The Wyoming plan. *Spectrum: Journal of State Government*: 33-34.

[381] Alberta Alcohol and Drug Abuse Commission. (2006). *Alberta Drug Strategy: Co-ordinated Alberta Response to Methamphetamine* (2nd ed.). Accessed December, 2006 from http://corp.aadac.com/content/corporate/other_drugs/coordinated_response_to_meth.pdf.

[382] *Ibid.*

[383] British Columbia. (April 18, 2006). *Fact sheet: B.C.'s Crystal Meth Strategy*. Ministry of Public Safety and Solicitor General. Accessed May, 2007 from http://www.pssg.gov.bc.ca/crystalmeth/pdf/crystal_meth_strategy.pdf.

[384] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf.

[385] Ministry of Public Safety and Solicitor General. (May 11, 2007). *News Release: Vancouver Island Communities Tackle Crystal Meth*. Accessed May, 2007 from http://www2.news.gov.bc.ca/news_releases_2005-2009/2007PSSG0030-000605.htm.

[386] British Columbia. (April 18, 2006). *Fact sheet: B.C.'s Crystal Meth Strategy*. Ministry of Public Safety and Solicitor General. Accessed May, 2007 from http://www.pssg.gov.bc.ca/crystalmeth/pdf/crystal_meth_strategy.pdf.

[387] British Columbia. (2006). Provincial Government Crystal Meth Program Grants: Community Responses as reported by the Union of BC Municipalities, June 30, 2006. Accessed May, 2007 from http://www.pssg.gov.bc.ca/crystalmeth/pdf/CrystalMethGrants2006.pdf.

[388] British Columbia. (April 18, 2006). *Fact sheet: B.C.'s Crystal Meth Strategy*. Ministry of Public Safety and Solicitor General. Accessed May, 2007 from http://www.pssg.gov.bc.ca/crystalmeth/pdf/crystal_meth_strategy.pdf.

[389] No author. (March 24, 2006). Matrix model used in meth pilot project. *Maple Ridge Times*. Accessed May, 2007 from http://www.mrtimes.com/issues06/034206/news/034206nn4.html.

[390] British Columbia. (April 18, 2006). *Fact sheet: B.C.'s Crystal Meth Strategy*. Ministry of Public Safety and Solicitor General. Accessed May, 2007 from http://www.pssg.gov.bc.ca/crystalmeth/pdf/crystal_meth_strategy.pdf.

[391] *Ibid.*

[392] *Ibid.*

[393] British Columbia (2007). *No2Meth website.* http://www.no2meth.ca/.

[394] Crystal Meth Society of BC. (2007). *Backgrounder, March 2007*. Available from www.crystalmeth.bc.ca.

[395] Meth Watch Program. (2007). *Meth Watch website*. Accessed May, 2007 from http://www.methwatch.com/index.aspx.

[396] Crystal Meth Society of BC. (2007). *Backgrounder, March 2007*. Available from www.crystalmeth.bc.ca.

[397] *Ibid.*

[398] Haugeneder, R. (2007). Drug-house bylaw getting sharper teeth. *Goldstream Gazette*. Accessed May, 2007 from http://www.mapinc.org/drugnews/v07/n530/a09.html.

[399] Fontaine, P. (2007). Crown can seize Abbotsford grow-op homes, court rules. *The Abbotsford Times*. Accessed May, 2007 from http://www.mapinc.org/drugnews/v07/n534/a05.html.

[400] Saskatchewan Health. (2004). *A Strategic Plan for Crystal Meth and Other Amphetamines in Saskatchewan.* Accessed January, 2007 from http://www.health.gov.sk.ca/mc_dp_crystalmeth_skstrategy.pdf.

[401] Alberta Alcohol and Drug Abuse Commission. (2006). *Alberta Drug Strategy: Co-ordinated Alberta Response to Methamphetamine* (2nd ed.). Accessed December, 2006 from http://corp.aadac.com/content/corporate/other_drugs/coordinated_response_to_meth.pdf.

[402] Government of Alberta. (2006). *Backgrounder: Recommendations of the Premier's Task Force on Crystal Meth.* Accessed May, 2007 from http://www.premier.alberta.ca/cmeth/.

[403] No author. (2007). *Manitoba Meth Strategy.* Accessed January, 2007 from http://www.gov.mb.ca/healthyliving/meth.html.

[404] Tennessee Meth Task Force. (2004). *The Govenor's Task Force on Methamphetamine Abuse: Final Report.*

[405] Engler, J., Haveman, J., Yaldoo, C., & Madden, S. (2002). *Michigan Methamphetamine Control Strategy*. Accessed December, 2006 from http://www.michigan.gov/documents/MethStrategy2002_44051_7.pdf.

[406] No author. (2005). *Western Canadian Summit on Methamphetamine: Bringing Together Practitioners, Policy Makers and Researchers, Consensus Panel Report.* Vancouver Coastal Authority: Vancouver. Accessed November, 2006 from http://www.sfu.ca/dialog/Meth_Booklet_2005_Final.pdf. p.26.

[407] Gettig, J.P., Grady, S.E., & Nowosadzka, I. (2006). Methamphetamine: Putting the brakes on speed. *The Journal of School Nursing, 22*(2): 66-73. p.66

[408] Adapted from the National Drug Intelligence Center, Chemical Precursor Committee. (2002). *Information Bulletin: Children at Risk*. U.S. Department of Justice. Accessed December, 2006 from http://www.usdoj.gov/ndic/pubs1/1466/index.htm.