

INTRODUCTION

On Sept 6, 2017, Maine Public Radio released an article reporting that despite increased efforts, drug-related deaths in Maine are *not* projected to go down in 2017. Over the last year, Maine has increased its effort to bring awareness to the drug crisis. There was hope that this, combined with widespread use of the anti-overdose drug naloxone, would *significantly* decrease the number of overdose deaths this year. It hasn't. Maine Attorney General, Janet Mills, explained that 4 of 5 drug-related deaths are caused by an overdose of two or more substances. She concludes that Maine needs more treatment facilities and prevention efforts. "Otherwise... Maine is on track to witness at least one drug death per day in 2017," (Leary, 2017).

ADDICTION

Scientists began studying addiction in the 1930s. Since that time, research has evolved from being a "moral failing" to a health problem, dramatically changing how we respond to persons who are addicted or have substance use disorders. Discoveries about the brain have changed the understanding of compulsive drug use, enabling health professionals to respond effectively to the problem (Drugs, Brains and Behavior, 2017).

Substance use and addiction interfere with normal health functioning, contributing to physical and behavioral health problems, injuries, lost income and productivity, and often leads to family dysfunction (Substance Abuse Prevention for Early Childhood, 2016). Scientific research has found that addiction is a disease that affects both brain and behavior. It is caused by both environmental and biological factors, and possibly genetics as well. Scientists have been able to use this knowledge to develop effective prevention and treatment approaches that reduce the impact of drug use on individuals, families, and communities (Drugs, Brains and Behavior, 2017).

SUBSTANCE USE AND ADDICTION INTERFERE WITH NORMAL HEALTH FUNCTIONING, CONTRIBUTING TO PHYSICAL AND BEHAVIORAL HEALTH PROBLEMS, INJURIES, LOST INCOME AND PRODUCTIVITY, AND OFTEN LEADS TO FAMILY DYSFUNCTION.

- SUBSTANCE ABUSE PREVENTION FOR EARLY CHILDHOOD, 2016

Transitions

Personal risk increases at various points in life, especially during times of transition. Transitions introduce new potential risk factors and are times when individuals are more vulnerable. The increased risks make these periods of life prime opportunities for preventive intervention (Substance Abuse Prevention for Early Childhood, 2016). For adults, transitions may be divorce, job loss, graduation, moving, or illness. For adolescents, times of transitions may be entering middle school or high school. These are times when youth are exposed to new challenges both socially and academically (Drugs, Brains and Behavior, 2017). For children, transitions may be biological, such a puberty, or entering into a new environment, such as starting a new school. How

people respond to these transitions are based on their development at that point in time, as well as history, family, and their environment (Substance Abuse Prevention for Early Childhood, 2016).

Mental Illness

The relationship between substance use disorder and other psychiatric disorders is complex, and not fully understood. Research suggests that those with mental health disorders are more likely to experience alcohol or substance use disorder. Though the reason for this is less certain; genetic or biological risk factors may cause or influence each other (Substance Abuse Prevention for Early Childhood, 2016). When both disorders are present, it is referred to as a co-occurring disorder. Co-occurring disorders can be difficult to diagnose due to the complexity of symptoms, varying in severity (Co-Occurring disorders, 2016).

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- SUBSTANCE ABUSE PREVENTION FOR EARLY CHILDHOOD, 2016

Individuals with co-occurring disorders are best treated with integrated treatment where both disorders can be treated simultaneously, thus producing better results. Increasing awareness and building service systems are important in helping to identify and treat people suffering from co-occurring disorders (Co-Occurring Disorders, 2016).

STRATEGIES

In the sections below, Strategies will be discussed as 1) Prevention and 2) Treatment and Recovery.

PREVENTION

Prevention is the best strategy. Early drug use increases one’s chances of developing addiction, therefore preventing early use of drugs or alcohol can help reduce risks. (Drugs, Brains and Behavior, 2017).

In studying addiction, scientists have created prevention programs to positively balance risk and protective factors, and mitigate the threat of drug use in families, schools, and communities. Risk factors are additive, the more risk factors an individual is exposed to, the more likely he or she will abuse drugs. (Drugs, Brains and Behavior, 2017). Risk and protective factors are listed in Table 1.

RISK FACTORS	DOMAIN	PROTECTIVE FACTORS
Aggressive behavior in childhood	Individual	Good self-control/ Impulse control
Lack of parental supervision	Family	Parental monitoring and support
Poor Social Skills	Individual/Family	Positive relationships
Drug Experimentation/ Substance Abuse	Peer	Academic competence
Drug Availability	School	Anti-use policies
Poverty	Community	Neighborhood pride/ Neighborhood attachment

Table1: Risk and Protective Factors, (Drugs, Brains and Behavior, 2017) and (NIDA Preventing Drug Use in Children and Adolescents, 2003)

Productive prevention programs help to boost protective factors and eliminate or reduce risk factors for substance use. There are three categories of programming: Universal, Selective, and Indicated. *Universal programs* address risk and protective factors common to all children in a given community or setting. *Selective programs* target groups who have factors that put them at increased risk of substance use. *Indicated programs* are designed for those who are already using (NIDA Drugs, Brains and Behavior). ***When research-based substance use prevention programs are properly implemented by schools and communities, use of alcohol, tobacco, and illegal drugs is reduced*** (NIDA Drugs, Brains and Behavior).

While substance use and abuse can affect persons at any stage of life, the following sections focus on pregnancy, childhood (to curtail future drug use), adolescence, and older adults.

Pregnancy

Exposure to substances during pregnancy can affect children throughout their lifetimes. Alcohol, tobacco, and other drugs can permeate the placenta exposing the developing brain to the effects of the substance (Substance Abuse Prevention for Early Childhood, 2016).

- Smoking has been linked to increased risk for slowed fetal growth and low birth weight, stillbirth, pre-term birth, infant mortality, Sudden Infant Death Syndrome (SIDS), and respiratory problems.
- Alcohol can cause miscarriage, stillbirth, and a range of lifelong disorders that are characterized as Fetal Alcohol Spectrum Disorders (FASDs) – which can lead to physical, cognitive, and behavioral problems.
- Illicit drug use can have adverse effects ranking from low birth weight to development problems related to behavior and cognition.
- Even some types of prescription drugs may have an effect. Babies of mothers who chronically take opioid medications for pain, or who are abusing the medications, may be born with physical dependency, causing withdrawal, called Neonatal Abstinence Syndrome (NAS), which can require prolonged hospitalizations (Substance Abuse Prevention for Early Childhood, 2016).

**DRUG AFFECTED
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- DIOMEDE, 2015**

Maine has increased awareness and education of providers to notice, identify, and work to address substance use during pregnancy; however, Drug Affected Baby Notifications has increased considerably. From 2005 to 2014, the number of Drug Affected Baby Notifications increased by 480%; Penobscot and Washington counties reported the highest rates (Diomedede, 2015).

Possible Actions:

- Increase awareness of the threats of substance use during pregnancy and lasting impacts;
- Encourage medical professionals to identify and address substance use during pregnancy; and
- Connect pregnant women with medical intervention and support programs that they need.

Childhood

Life at home, especially during childhood, effects the likelihood of substance experimentation or addiction. Adverse childhood experiences (ACE) are stressful or traumatic events that may include abuse, neglect or dysfunction. Research has shown there is a strong correlation between these types of experiences (ACEs) and a variety of health problems, including substance use (Adverse Childhood Experiences, 2017). Research also indicates, when family members abuse alcohol or drugs, or engage in criminal behavior, it increases the likelihood that children will follow suit (Drugs, Brains and Behavior, 2017).

While substance use typically begins in adolescence, research has shown there are known biological, psychological, social, and environmental factors that contribute to accumulating risk factors that begin as early as prenatal. This provides an opportunity to intervene early, and research has indicated that **“early intervention can prevent many adolescent risks,”** (Substance Abuse Prevention for Early Childhood, 2016).

For young children exhibiting serious risk factors, early intervention can have the most positive effects. Delaying interventions may increase the difficulty in overcoming numerous risk factors as a child grows. Research supports interventions that: reduce risk factors; promote positive factors; and increase access to resources and support services, for both the child and caregivers (Substance Abuse Prevention for Early Childhood, 2016).

Research has shown that early risk factors for substance use are simultaneously risk factors for other mental, emotional, and behavioral problems. Risk factors identified in the research are early-onset externalizing behavior problems, such as aggressive and disruptive behaviors in preschool, which have been linked to conduct disorders, substance use, delinquency, and risky sexual behaviors in adolescence (Substance Abuse Prevention for Early Childhood, 2016). Interventions designed to prevent substance use may provide positive benefits in other parts of children’s lives, including improved personal and social skills, family functioning, higher academic and career achievement, and less involvement with the criminal justice system and mental health services (Substance Abuse Prevention for Early Childhood, 2016).

Research continues to support that a stable home environment, adequate nutrition, physical and mental stimulation, warm supportive parenting, and high-quality early childhood education can lead to developing strong emotional and behavioral control. These factors help to protect against potential risks factors (Substance Abuse Prevention for Early Childhood, 2016). Well-designed intervention for very young children can improve both children’s and their families’ quality of life, and benefit the community as a whole (Substance Abuse Prevention for Early Childhood, 2016).

Possible Actions:

**THERE IS A STRONG
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VARIETY OF HEALTH
PROBLEMS,
INCLUDING
SUBSTANCE USE.**

**- ADVERSE CHILDHOOD
EXPERIENCES, 2017**

- Educate and increased communication between early childhood educators, medical professionals, and parents to identify early risk factors in children and provide support and resources, as necessary, to address issues early;
- Support programs that stabilize families, enabling them to provide a safe, decent home, and adequate nutrition for their families;
- Invest in early intervention programs, such as the Nurse Family Partnership which works to keep children healthy and safe, and improve the lives of mothers and babies; and
- Invest in high-quality early education programs that screen and identify risk factors, partner for intervention in the case of trauma, and provide family resources and support.

Adolescence and Young Adults

Research has indicated that most people begin using substances during adolescence and early adulthood. This includes tobacco, alcohol, prescription, and illegal drugs (Adolescent Substance Use Disorder Treatment, 2014). Normal adolescent and teen development cause them to take greater risks, explore, and experiment. (Substance Abuse Prevention for Early Childhood, 2016). Research indicates that adolescents are biologically wired to seek new experiences and take risks in order to carve out their own identity. Drug and substance experimentation can fulfill that desire (Adolescent Substance Use Disorder Treatment, 2014).

TEENAGERS ARE STILL DEVELOPING JUDGEMENT AND DECISION-MAKING SKILLS, AND THIS MAY LIMIT THEIR ABILITY TO ASSESS THE RISKS OF DRUG USE.

- DRUGS, BRAINS AND BEHAVIOR, 2017

Availability of drugs and alcohol play a role in whether an adolescent will experiment. Once teens enter high school, they may find themselves in situations in which substances are easily accessible. Studies show that teenagers use drugs to share experiences with friends, improve their appearance or performance, or to help them study or lose weight. Teenagers are still developing judgment and decision-making skills, and this may limit their ability to accurately assess the risks of drug use (Drugs, Brains and Behavior, 2017).

Nationally, almost 70% of seniors have tried alcohol, 50% have used an illegal drug, 40% have tried cigarettes, and 20% have used prescription drugs for nonmedical purposes (Adolescent Substance Use Disorder Treatment, 2014). For high school students in Maine, the report *Substance Abuse Trends in Maine* (2015) found that *in the last month*: 26% reported consuming alcohol, of whom 15% reported binge drinking (having five or more drinks in a row); 22% reported using marijuana; 13% reported smoking at least one cigarette; 9% reported using inhalants; 6% have taken prescription drugs that were not prescribed to them; and 5% reported using cocaine (Hornby Zeller Associates, 2015). [*Please note national statistics are for individuals who have ever tried substances, while Maine statistics are for those who have used in the last month.*]

While most teens do not escalate from trying drugs to developing addictions, research has found that even experimentation can lead to harmful side effects and other risky behavior, such as unsafe sex or driving while intoxicated (Adolescent Substance Use Disorder Treatment, 2014).

Possible Actions:

- Reduce social access (getting drugs and alcohol from friends and family);
- Reduce or eliminate retail availability (not carding, over prescribing/dispensing);
- Reduce pricing and promotion (two for one specials, industry sponsorships or signage);
- Increase enforcement (lack of compliance checks, enforcing policies, laws);
- Change the perception of alcohol, tobacco, and drug use in the community. Educate families and community about addiction and supporting people in treatment or recovery, identify support groups and community forums, and engage recovery community. How substances are discussed and viewed within the family and community affects:
 - Social/ Community Norms (parental/ community attitudes and belief)
 - Perception of Harm (individual’s belief of whether a substance is harmful)
 - Perceived risk of being caught (Individuals belief that s/he will be caught)
 (Hornby Zeller Associates, 2015)

The actions suggested here are strategies not only for adolescents, but adults as well. It is assumed that making changes to these factors at the community level will result in changing behaviors around substance use and related problems in Maine. It is believed that addressing these factors will help Maine to achieve population-level changes in substance consumption and consequences (Hornby Zeller Associates, 2015).

Older Adults

According to the U.S. Census, the five-county region has a higher population of persons over the age of 65 than the state average (U.S. Census, ACS v2014). This is relevant, as substance use is emerging as a public health concern among older adults. This population is more likely to have chronic health conditions and take prescription medications, which can complicate adverse effects of substance use (Mattson, 2017).

Alcohol has emerged as a cause for concern. While alcohol is legal, its interaction with prescription drugs can be dangerous, including over the counter drugs, herbal remedies, and prescriptions. It can also exacerbate common medical conditions, including stroke, high blood pressure, diabetes, osteoporosis, memory loss, and mood disorders. The combination of multiple medications, or combining medications and alcohol, may have adverse effects that could lead to trips to the Emergency Department (Mattson, 2017).

Signs of possible substance misuse among older adults may include: physical symptoms such as injuries, increased tolerance to medication, blackouts, and cognitive impairment; psychiatric symptom such as sleep disturbances, anxiety, depression, and mood swings; and social symptoms such as legal, financial, and family problems (Mattson, 2017).

As substance use in older adults continues to be investigated here in Maine, it has been noted that this is “a situation that remains underestimated, under-identified, underdiagnosed and in some ways, misunderstood,” (Substance Abuse & Misuse Among the Elderly, AdCare).

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Possible Actions:

- Work with healthcare professionals, social workers, and families to identify risk factors;
- Educate older adults in the harm of combining substances and offer support; and
- Continue to study substance use in older adults to understand the extent of the issue.

The National Institute on Drug Abuse has identified the following Strategies for Prevention for Communities to follow. They include the following:

- Identify specific drugs and other problems in the community/region;
- Identify what existing resources and programs currently exist in the region. Assess their effectiveness. Core elements of an effective program are: structure, content, and delivery;
- Develop short- and long-term goals, relevant to implementation of research-based prevention programs; and
- Incorporate ongoing assessments to evaluate effectiveness (NIDA Preventing Drug Use in Children and Adolescents, 2003).

TREATMENT AND RECOVERY

Drug addiction is a chronic disease that is defined by compulsive, uncontrollable drug seeking and use, despite harmful consequences. Ongoing drug use changes the way the brain works, leading to unpredictable and sometimes harmful behaviors. Many things can “trigger” drug cravings within the brain, often leading to relapses, or returns to drug use after an attempt to stop (NIDA Treatment Approaches for Drug Addiction, 2016). Treatment is possible, but difficult. Those in recovery must learn how to recognize, avoid, and cope with triggers they are likely to be exposed to during and after treatment. Addiction is chronic, and most patients need long-term or repeated care (NIDA Treatment Approaches for Drug Addiction, 2016).

Addiction treatment has three primary goals, to help a person stop using drugs or alcohol, stay substance free, and be a productive member of society (NIDA Treatment Approaches for Drug Addiction, 2016). Successful treatment is comprised of several steps, including:

1. Detoxification, which removes the substances from the body, sometimes causing withdrawal symptoms (NIDA Treatment Approaches for Drug Addiction, 2016).
2. Behavioral therapy, which assists users to be active participants in their recovery and addiction, enhancing their ability to resist drug use. A holistic approach, including personal incentives, personal tools, family, life skills, and environmental changes aid in success.
3. Addiction medications have been found effective in treating addiction to opioids, alcohol, and nicotine in adults. However, none have been approved by the FDA for adolescents.
4. Recovery support and long-term treatment are essential to provide the follow-up necessary for success. Community programs, where peers in recovery share experiences, provide mutual support, and encourage a substance-free lifestyle have been beneficial, although not a substitute for treatment (Adolescent Substance Use Disorder Treatment, 2014).

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- TREATMENT APPROACHES
FOR DRUG ADDICTION, 201**

People who use more than one drug, which is very common, need treatment for all substances that they use (NIDA Treatment Approaches for Drug Addiction, 2016). All treatment must be tailored to the person's specific drug use patterns, personality, and other medical, social, or psychiatric needs (Drugs, Brains and Behavior, 2017).

Research has shown that combining efforts, specifically detoxification and behavioral counseling, have produced the most successful results. Medications help patients treat withdrawal, stay in treatment, and prevent relapse (Drugs, Brains and Behavior, 2017). Behavioral therapy engages one in their own recovery, modifying their drug-related attitudes and behaviors. Successful therapies also work to increase life skills to handle stressful circumstances, and identify and appropriately deal with triggers that may lead to intense cravings and possible relapses (Drugs, Brains and Behavior, 2017).

Research indicates that family intervention is the most successful approach for adolescents. Engaging the family, parents, siblings, friends, and sometimes peers helps to create positive influences. Parents, specifically, need to be on board to create the structure, rules, accountability, and support adolescents need for successful recovery. Family-based approaches often address a wide variety of problems in addition to substance use, including: family communication and conflict; co-occurring behavioral, mental health, and learning disorders; problems with school or work attendance; and peer networks (Adolescent Substance Use Disorder Treatment, 2014).

Possible Actions:

- Reduce bias and stigma through education and compassion;
- Support people in treatment and recovery by creating opportunities for employment, housing, and education, and reduce barriers to treatment, such as transportation;
- Engage the recovery community in mentoring and peer-to-peer support;
- Support harm reduction strategies, including drug take-backs programs, needle exchanges, and educational efforts for safe storage;
- Expand medical coverage, especially Medicaid, to the most vulnerable populations, who experience homelessness, substance use, and co-occurring disorders and are often without medical insurance to cover the cost of treatment and ongoing recovery; and
- Continued to increase collaboration and communication among providers to work together to find solutions; including engaging multiple state agencies (Health and Human Services, Office of Corrections, Education, Labor, CDC, Attorney General, and others) agencies to work in tandem with with local municipal offices, hospitals, stakeholders, and the general community to address the issue.

LIST OF REFERENCES

- Adverse Childhood Experiences, (Updated September 2017) *Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services*. Retrieved on 10/2/17, <https://www.samhsa.gov/capt/practicing-effective-prevention/prevention-behavioral-health/adverse-childhood-experiences>
- Co-occurring Disorders, (March 2016) *Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services*. Retrieved on 09/05/17, <https://www.samhsa.gov/disorders/co-occurring>
- Diomedes, T., (2015) SEOW Special Report: Heroin, Opioids and Other Drugs Maine. *State Epidemiological Outcomes Workgroup; Office of Substance Abuse and Mental Health Services; Maine Department of Health and Human Services*. Retrieved on 07/16/17, http://www.maine.gov/dhhs/samhs/osa/data/cesn/Heroin_Opioids_and_Other_Drugs_in_Maine_SEOW_Report.pdf
- Drugs, Brains and Behavior: The Science of Addiction. (April 2007) *National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services*. Retrieved on 08/17/17, https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/soa_2014.pdf
- Family Checkup: Positive Parenting Prevents Drug Abuse, (August 2015) *National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services*. Retrieved on 09/05/17, https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/familycheckup_8_15.pdf
- Hornby Zeller Associates, (July 2015) Substance Abuse Trends in Maine State Epidemiological Profile 2015. *Office of Substance Abuse and Mental Health; Department of Health and Human Services*. July 2015. Retrieved on 06/27/17, <http://www.maine.gov/dhhs/samhs/osa/documents/SEOWEpiProfile2015FINALDRAFT.pdf>
- Leary, Mal. Maine Drug Deaths Continue At About Same Level As 2016. *Maine Things Considered!; Maine Public*. Retrieved on 09/07/17, <http://mainepublic.org/post/maine-drug-deaths-continue-about-same-level-2016#stream/0>
- Mattson, M., Lipari, R., Hays, C., Van Horn, S., (May 2017) A Day In the Life of Older Adults: Substance Use Facts, *Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services*. Retrieved on 09/19/17, https://www.samhsa.gov/data/sites/default/files/report_2792/ShortReport-2792.html
- Mental and Substance Use Disorder, (September 2017) *Substance Abuse and Mental Health Services Administration*. Retrieved on 08/17/17, <https://www.samhsa.gov/disorders>
- National Institute on Drug Abuse: Media Guide, (October 2016). *National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services*. Retrieved on 08/17/17, https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/mediaguide_11_16.pdf
- Nurse Family Partnership website, Retrieved on 9/14/17, <https://www.nursefamilypartnership.org/about/>
- Preventing Drug Use Among Children and Adolescents, A Research Guide for Parents, Educators and Community Leaders, 2nd Edition. (October 2003) *National Institute on Drug Abuse; National Institutes of Health*

Health; U.S. Department of Health and Human Services. Retrieved on 9/5/17,
https://www.drugabuse.gov/sites/default/files/preventingdruguse_2.pdf

Principles of Adolescent Substance Use Disorder Treatment: A Research-Based Guide, (January 2014)
National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services. Retrieved on 08/17/17,
https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/podata_1_17_14.pdf

Principles of Substance Abuse Prevention for Early Childhood: A Research Based Guide. (March 2016)
National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services. Retrieved on 08/17/17,
https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/early_childhood_prevention_march_2016.pdf

Quick Facts by County, State and U.S. Population Estimate. (2014). *U.S. Census, ACS V2014*.

Recommendations of the Maine Opiate Collaborative. (May 2016), Prevention and Harm Task Force, Law Enforcement Task Force, and Treatment Task Force. Retrieved 09/19/17,
<http://www.themha.org/Publications/Recommendations-of-the-Maine-Opiate-Collaborative.aspx>

Substance Abuse & Misuse Among the Elderly. *AdCare Educational Institute of Maine*. Retrieved on 09/19/17, <http://adcareme.org/seniorsubstanceabuse/>

Treatment Approaches for Drug Addiction. (July 2016) *National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services*. Retrieved on 09/08/17,
<https://www.drugabuse.gov/publications/drugfacts/treatment-approaches-drug-addiction>