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**Disrupting Negative Developmental Trajectories Using Evidence-Based Preventive Interventions for Children with a Substance-Dependent Caregiver**

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## Abstract

Disrupting pathways to negative outcomes in children and adolescents who have caregivers with substance use disorder (SUD) is of the highest priority if we are to gain control over the opioid epidemic. This population is at very high risk for becoming the next generation of individuals with SUD, as well as other types of psychopathology and eventual juvenile/criminal justice involvement. In addition to experiencing severe/chronic adversities during their development, these youth are now further propelled toward these negative trajectories due to the COVID-19 crisis, which substantially compounds the issues (e.g., estrangement from otherwise normalizing social influences, such as school, nondelinquent peers, extended families, health care, etc.) for both the young person and the parent with SUD. We review the literature establishing the linkages between adverse childhood experiences and pathways to SUD. Our focus is particularly on opportunities for intervention across development using family-based programs that directly address parenting skills and trauma. Invoking structural level change to merge SUD treatment and evidence-based family intervention infrastructures in communities promises to both reduce externalizing behaviors and internalizing symptoms in these youth, as well as reinforce recovery in the parents. Currently, these systems do not intersect; thus, children do not often receive programming and treatment of caregivers for SUD is less effective without engagement of the family unit.

The rising tide of opioid use disorder (OUD) in this country has led to a national crisis that cannot be underestimated.<sup>1</sup> All segments of our society have been affected. From fetuses to the elderly, across all economic classes, races, and ethnicities, and in urban, suburban, and rural contexts, millions of families are suffering the effects on some level. In places where the problem is most concentrated, opioid dependence has shattered the very fabric of those communities and placed a tremendous strain on the whole range of social systems that are otherwise there to serve us. Clearly, we have not yet found a solution to this monumental problem. And now, in the midst of a pandemic, with the rates of substance abuse even further escalating, the call for a national strategy is even more dire.

Current policy initiatives primarily focus on relapse and recovery supports for individuals with active OUD—an approach sorely needed to effectively address a problem already entrenched and remediable with effective treatment. A more balanced strategy, however, invests at least as heavily in disrupting developmental pathways to substance use disorders (SUDs) in children at risk for initiating, escalating, and becoming dependent on substances. Such an approach has potential to substantially reduce the number of adults struggling with SUD, alleviating a significant amount of the burden on treatment, mental health, and child welfare systems that are currently attempting to manage the consequences of our inattention to earlier phases of development. The science over the past 40 years has clearly delineated the social determinants of health that, when awry, forecast maladaptive developmental trajectories, leading to a host of behavioral and mental health problems, including SUDs. Fortunately, prevention research has designated dozens of strategies as evidence-based with the potential to redirect these pathways, which are largely driven by malleable, preventable, and/or treatable individual-level and social contextual conditions.<sup>2</sup>

One group at especially elevated risk includes children of caregivers with SUDs. Proximal conditions that often characterize the social ecology of caregivers with OUD/SUD have potential to directly threaten the safety, healthy development, and school readiness of these children.<sup>3-5</sup> And as they age into adolescence and early adulthood, the resultant developmental deficits and delays place them at extreme disadvantage. We can reasonably predict that, in the absence of an evidence-based, wide-scale approach to early intervention, the rate of OUD/SUD in this generation and those to follow may exceed the impact of today's morbidity and mortality from opioid dependence and overdose. Despite the prospect of significant intergenerational impacts, the issue has received little attention in our policy priorities and has been considered less urgent.<sup>6</sup> In effect, children of caregivers with SUDs are quiet constituents, easy to ignore, stigmatized and neglected, with little to no access to needed services.

To provide background regarding the risks to children posed by parents with SUD, we begin with a brief review of the literature on social determinants of SUDs among children of caregivers with SUD throughout childhood and adolescence. An emphasis is placed on the well-established body of work demonstrating that SUDs do not develop in a vacuum but rather are profoundly impacted by childhood experiences and exposures that have potential to alter neurodevelopment, for better (e.g., parental involvement) or for worse (e.g., adversity). Following this overview, the role of parenting and family functioning specifically pertaining to caregivers with SUD in child developmental pathways is discussed. Based on this foundational knowledge, subsequent sections focus on the malleability of both individual-level and social conditions in response to well-targeted, evidence-based intervention. Various modalities and settings for intervention are presented, along with the potential for educational initiatives and policy reforms to strengthen resiliency in otherwise at-risk children and adolescents more

broadly. Importantly, we provide support for the contention that, if we wait until substance use initiation in adolescence, we may have missed critical opportunities to address the intermediate phenotypes (e.g., poor self-regulation, aggression, inattention) that commonly antedate and predict risk for SUD. However, due to substantial social and neurobiological growth in adolescence, it is never too late.

### **What Science Tells Us about Pathways to SUDs**

Scientists in the research trenches have extensively addressed the individual characteristics and environmental conditions conducive to substance abuse and the nature of “resistance” factors that protect some individuals from escalating their use or that promote recovery.<sup>7,8</sup> There is now abundant knowledge on the problem, its causes, prevention, and treatment.<sup>9</sup> Well-known is that adverse childhood experiences (ACEs)—such as trauma, child maltreatment, poverty, witnessing violence, parental incarceration, or loss of a parent—are the common denominator in pathways to a wide range of negative behavioral and mental health outcomes.<sup>9,10</sup> Chronic and/or severe exposure to adversity has potential to exhaust available internal and external resources that lead to dysregulated behavioral and emotional responses to both daily challenges and future acutely stressful events, thus exerting long-term effects on developmental pathways. Research has established that increasing levels of emotional and physiological stress are directly associated with decreases in behavioral control, heightened impulsivity and reward sensitivity, and high levels of maladaptive behaviors.<sup>11–13</sup> And there is a significant body of evidence to support the role of stress specifically in the development of SUDs,<sup>9,14,15</sup> a relationship that is particularly marked when adversity occurs in early childhood.<sup>16</sup> This fundamental relationship is clearly demonstrated by results of the ACEs study (Table 1).<sup>16–</sup>  
<sup>18</sup> These findings suggest that very early development sets the stage for drug use initiation

through primary biological, psychological, and social responses to stress.

**Table 1. Estimates of the Population-Attributable Risk of ACEs for Selected Outcomes among Women**

Population-Attributable Risk of Adverse Childhood Experience	Substance Use
65%	Alcoholism
50%	Harmful use of drugs
78%	Injecting drug use

\*Early life adversity is markedly associated with increased risk of substance use, harmful substance use, and drug dependence. Drug use may occur as a maladaptive response to stressful experiences.

The mechanism underlying the impact of ACEs on risky behaviors is the damage stress can inflict on the maturation and functioning of the developing brain, which is exquisitely sensitive to environmental experiences throughout life. Dramatic alterations in the architecture of the growing brain results, in part, from the flood of hormones and changes in neurotransmitter and neuropeptide systems triggered during acute and severe stress reactions.<sup>19–23</sup> The impacts can be observed in the brain’s prefrontal cortex (PFC), the key structure for performing executive cognitive functions (e.g., goal-setting, problem-solving, attention, working memory, impulse control), and the limbic system, which regulates emotion reactivity. Under normal conditions, these systems function to maintain system-wide stability, or allostasis.<sup>24</sup> Under undue stress, activities of structures within these regions and their shared circuitry are altered, resulting in impaired organization and coordination between a myriad of cognitive and emotional processes, as well as poorly regulated physiological responses to stress. As such, these stress-induced maladaptations increase risk for developing dysregulated behavior (e.g., aggressiveness, poor emotional and attentional self-control, conduct problems) and poor social competency skills (e.g., low self-efficacy, poor academic achievement, lack of prosocial skills), increasing risk for substance use<sup>25</sup> and characterizing the substance abuse phenotype (Figure 1).

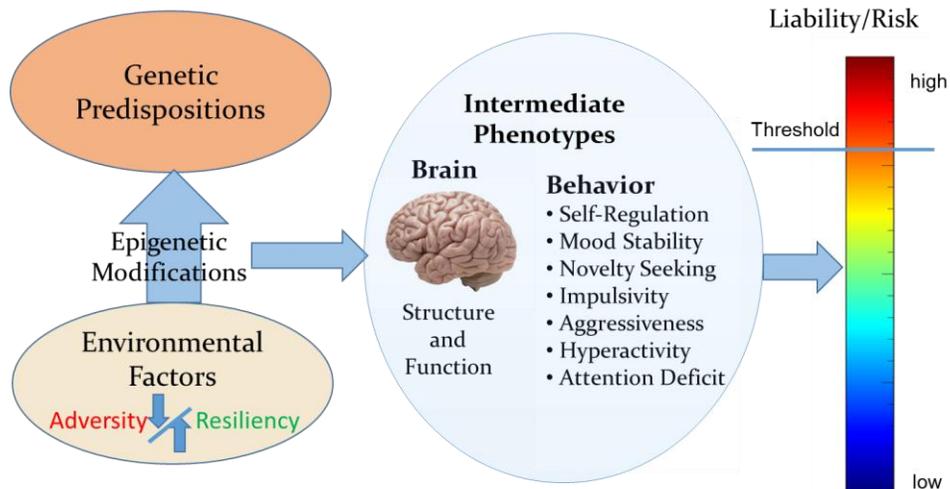


Figure 1. The Accumulative Risk Model. Shown here are the two main categories of factors that constitute the accumulative developmental context, i.e., genetic and environmental factors. The combined effect of the number, type, and severity of these factors confers risk for substance abuse. This conceptualization reflects the common binary consideration of genetic risk (i.e., individuals are often considered at risk or not, depending on the particular variant of a given gene they happen to carry). To reflect their more continuous nature, the influence of environmental factors depends on the nature (e.g., protective versus adverse) and magnitude of the experience. The unique combination of genetic variants and environmental factors drives neurodevelopmental trajectories that underlie particular cognitive, behavioral, and affective intermediate phenotypes, which, in turn, can result in an increased liability threshold, beyond which an individual is considered to be at greater likelihood of developing problematic substance use behaviors and eventual SUD. Importantly, some environmental factors may exacerbate (e.g., stress) or attenuate (e.g., nurturance) the effects of the particular genes via epigenetic modifications.

Because the neural and behavioral systems responsible for adaptive responses to stress are “under construction” during childhood and adolescence, they are especially vulnerable to the impacts of adversity and may be compromised in their development. On the other hand, as discussed below, the brain’s experience-dependence offers critical opportunities to promote healthy development.

### Parenting and Family Functioning

For the brain to develop robustly, caring relationships are a key ingredient.<sup>26</sup> From infancy through childhood and even into adolescence, parents are virtually an extension of the child and are required for their healthy development. Because caregivers are the single most profound influence on early child development in multiple domains of functioning,<sup>27</sup> the positive ways in which parents interact with their children can have a huge impact on children’s overall

development, including that of the brain. Healthy parenting supports the emergence of a network of biological and psychological functions<sup>28</sup> that enable children to function in multiple domains, such as the ability to learn, self-regulate behavior and emotion, establish healthy relationships, and navigate their social environment.

Although the social and emotion regulatory skills prerequisite to resisting substance use and other problem behaviors in adolescence are ideally instilled very early in life, adolescence continues to be an extraordinarily “plastic” period of development. Parenting and family also remain important influences through adolescence when youth expect more autonomy and are presented with greater opportunities for risky behaviors. Adolescent brains have still not matured to the point that they can restrain their most risky impulses and often express poor decision-making ability even under normative circumstances.<sup>29</sup> This neurobiological immaturity in interaction with newfound autonomy and social demands helps to explain why adolescence is the most common period for substance use initiation, even in the absence of ACEs.<sup>30,31</sup>

Because parenting and home environment remain influential throughout development, parenting styles that are harsh, restrictive, emotionally triggered, inconsistent, hostile, and/or high in conflict significantly increase the likelihood that mental and behavioral health problems will surface during adolescence.<sup>32</sup> Abuse, neglect, and domestic violence represent more severe forms of ACEs from within the home, and, as such, they threaten every aspect of children’s development. Children exposed to high rates of these types of stress and conflict show more behavioral and emotional maladjustment than children in families that experience lower levels of conflict; they are 2 to 4 times more likely to have high levels of mental and physical health issues compared to national norms.<sup>33</sup>

### ***Caregiver OUD/SUD as an ACE***

Based on the knowledge amassed and summarized above, the strong and consistent association between parental SUD and risk for SUD in their children is not surprising.<sup>34</sup> These families often reside in resource-poor, stressful environments, which can affect parenting and family contexts and pose a threat to children exposed to unstable lifestyles, violence, and crime.<sup>35</sup> The caregiving environment for these children is more likely to be disorganized and lacking in appropriate stimulation and support, thereby creating conditions that are stressful for children.<sup>36</sup> Moreover, these children are often exposed to significant ACEs, such as maltreatment, poverty, violence, and substandard housing conditions.<sup>37</sup> Further complicating outcomes, availability of quality childcare, educational programs, and healthcare are often either absent or suboptimal. Exposure to these adversities impedes growth, leads to dysregulated stress responses, increases risk for psychological disorders (e.g., depression, anxiety, and traumatic stress disorders) and compromises development of self-regulatory, social competency and learning skills.<sup>38</sup>

Longer-term, caregiver SUD places children at heightened risk for academic failure, severe behavioral and mental health problems, inability to enter the workforce, juvenile delinquency, and increased likelihood of developing an SUD themselves.<sup>3,5</sup> For many, exposure to parental SUD further increases risk for criminal justice involvement (e.g., acting out, juvenile delinquency, truancy). This cascade of detrimental effects from ACEs such as caregiver SUD can trigger a dual crisis of negative health and poor mental and behavioral health outcomes, impeding the future potential of the children affected.<sup>39-41</sup> The prevalence and impacts of ACEs are particularly dire in low-income urban and rural areas where SUDs and ACEs are more common, health care services are underutilized, and children are lost in the shuffle.<sup>42-44</sup>

Intervening at the level of parental conditions that directly impact parenting behavior is, thus, crucial to improving overall outcomes.

### ***Preventive Interventions for Intergenerational Effects***

The take-home message is not that intensive monitoring of adolescents is the only option for preventing risky behavior due to their incapacity to assess risks and exert internal controls. Rather, the key point is that the substantial reorganization of the brain that occurs during adolescence offers a critical time to strengthen and support brain connectivity through experience, by teaching adolescents social, emotional, cognitive, and competency skills. And an environment optimal for these experiences is within the home environment, working in concert with multiple other influential systems.

As such, the risk factors for SUD can be comprehensively and effectively addressed by scaling up a comprehensive set of evidence-based individual, family, school, and community-level preventive interventions and policies. Evidence-based programs exert their benefits by reducing exposure to the detrimental conditions and their harmful consequences that lead to SUDs in the first place.<sup>45</sup> At least 16 family-based programs significantly improve the quality of family life or raise resistance to poor quality and prevent many behavioral problems, including substance misuse, antisocial behavior, anxiety, depression, risky sexual behavior, school absences, and academic performance.<sup>46</sup> Numerous tested and effective school-based interventions can prevent these problems as well, from early childhood into adulthood.<sup>27</sup> In addition to traditional in-person delivery of school-based programs, web-based interventions that enable low-cost delivery and ensure program fidelity are being developed and tested for middle school, high school, and college students. These programs often include personalized feedback and, in some cases, embed prevention messages and skill development into highly engaging

games. Research on the efficacy of these web-based programs is promising.<sup>47-52</sup> Also, more than 40 policies have proven benefits in increasing families' economic and social stability,<sup>53</sup> which in turn reduces substance misuse. Extensive analyses of the costs and benefits of these programs indicate that most cost far less than they save in reduced healthcare, criminal justice, and educational costs, and in increased income to recipients.<sup>54</sup> Scaling these interventions and health-level policies is recommended to increase capacity of government agencies, practitioners/clinicians, schools, and communities to prevent the development of SUDs before the problem becomes entrenched.

### ***Developmentally Appropriate Programming***

It is crucial that prevention efforts for this population focus on parenting techniques that foster healthy development throughout childhood and adolescence (e.g., appropriate discipline practices, warmth, affection, positive attention, secure attachment, involvement, limit setting, supervision and monitoring, and positive reinforcements for acceptable behaviors). Training in parent skills often involves relieving the stressors and mental health problems that caregivers with poor skills often experience. Structural and functional characteristics of the family (e.g., cohesive, supportive, communicative) are equally as influential in a child's development of resiliency skills. Effective parenting intervention for caregivers with SUD can be especially helpful in preventing long-term problems for the children; instilling positive parenting skills serves to nurture their children's healthy development and strengthen family bonds, which is so critical to averting pathways to substance abuse. In essence, these efforts are likely to result in decreases in academic failure, behavioral problems, mental health disorders, and SUDs in the children,<sup>36</sup> and an increased commitment to recovery along with a reduction in relapse and overdose among caregivers.<sup>55</sup>

Providing evidence-based family programs to caregivers in treatment for SUD and their children is a well-established approach to reducing risk for drug use and deescalating ongoing use in their children.<sup>36,55</sup> Because children of caregivers with active SUD are at extreme risk for substance misuse due to a high level of exposure to child maltreatment, food insecurity, and other ACEs, evidence-based preventive interventions that are trauma-informed have been shown to significantly reduce those exposures.<sup>56–58</sup> Combining early intervention with a focus on families with caregiver treatment has been shown to boost the benefits and significantly reduce substance use initiation.<sup>57</sup> The family system must be factored into the understanding of disease development and maintenance as well as be included in the efforts necessary for successful ongoing treatment. Reinforcing the effects of ongoing treatment for caregivers by building parenting skills to strengthen family facilitates recovery and, in turn, has potential to reduce relapse and overdose risk.<sup>59</sup> Accordingly, merging these systems is likely to increase retention, reduce relapse, and reinforce recovery.<sup>59</sup>

Working closely with healthcare systems to imbed a reciprocal pipeline to both SUD treatment and family intervention would serve as a structural intervention—one that holds promise to benefit many more patients and their families and be more sustainable and systematized than any single intervention. In general, professionals who work with this population are well aware of the impact of caregiver SUD on families, particularly with regard to the effects of ACEs on the behavioral problems often experienced by the children. But they are often unaware of services available that will address this growing need. Building a bridge between treatment and prevention systems can increase access to evidence-based programs for these families. Several family and parenting programs have been shown to redirect trajectories of at-risk children away from substance misuse and in favor of positive outcomes, including

social competency and coping skills, self-regulation of behavior, improved academic performance, and reduced rates of school dropout, pregnancy, and juvenile justice involvement.<sup>60</sup>

Participating in such a dual system of care is likely to exert synergistic effects.

### **Establishing a Screening and Referral Infrastructure (SRI) for Family Intervention**

The multiple life-course conditions that influence whether an individual will develop SUDs are fortunately alterable and, in many cases, preventable. Protective conditions can be strengthened while detrimental factors can be attenuated or even prevented. Ready access to SUD treatment facilities, a greater number of available beds, and sufficient insurance coverage for effective treatment constitute one well-established approach for individuals who have already developed an SUD. Even more promising are proactive strategies for early identification of the warning signs and preventing exposure to contributory conditions during childhood. However, despite the acute risks posed by caregiver SUD, very little of the attention has focused on the systematic provision of evidence-based programs to children affected by caregiver SUDs. To ensure these children receive the services they need, one approach is to educate and equip professionals working with these families in some capacity. Court personnel, local agencies (e.g., law enforcement, public health services), schools, community organizations, and clinical facilities (e.g., treatment programs, primary care providers) are all well situated to address the needs of children who have caregivers with SUD.

An approach with potential to benefit an infinitely larger swath of families dealing with caregiver SUD than the provision of individual-level services focuses instead on structural change. This model involves an integral partnership between SUD treatment and a well-established family intervention, with potential to reduce behavioral problems that lead to substance use in children and adolescents, and to reinforce recovery in adults with SUD.<sup>57,61</sup>

Although each of these infrastructures commonly exists in communities, there is rarely a formalized relationship between them to provide a comprehensive set of services to the entire family unit. Several barriers limit the extent to which this integration has been actualized: (a) not all treatment providers are appropriately trained in evidence-based family interventions; (b) prevention providers are often not trained in the specialized needs of SUD-involved families; (c) intervention resources for treatment and/or prevention are often not available or accessible to families in need; (d) networks providing parent SUD treatment and family services are often not well coordinated; and (e) treatment dollars are limited, especially for family intervention. In effect, in outpatient SUD treatment, neither the children nor parents with SUD routinely receive family programming; in the absence of a family-centered approach, treatment is far less effective, and children do not benefit to the extent possible. A complement of family-based services is essential given that relationships with family and children play a key role in SUD treatment and relapse.

There are a number of ways to facilitate routine family programming for families impacted by caregiver SUD. Evidence-based family and parenting support services can be embedded into systems that regularly serve these families, e.g., SUD treatment providers, child protective services, drug courts, and family courts. In the case of SUD treatment, providers could train existing clinical staff in the delivery of these models or add clinicians who specialize in working with families to their staff. Child protective services, drug courts, and family courts can establish relationships with agencies that provide these services and adopt policies to routinely refer all families impacted by caregiver SUD for family and parenting evaluation and support.

Greater access to parenting support could be afforded through child-serving systems, the most obvious being well-child pediatric care. Regularly screening parents regarding their

parenting or child behavior concerns and providing brief guidance and referral to more intensive support when warranted could dramatically increase the number of families exposed to evidence-based parenting strategies.<sup>46,62</sup> Embedding parenting support into pediatric primary care would reach families across the continuum of risk including families impacted by caregiver SUD.

Alternatively, a community-based approach supportive of coordinating systems of care across different agencies and providers could be adopted. One such system, the Community HUB model, involves identifying an at-risk population. For families impacted by caregiver SUD, agencies are encouraged to identify and refer all eligible families to a single agency that provides a home or community visit by a case manager who assesses family needs and facilitates appropriate referrals with an emphasis on evidence-based service.<sup>63</sup> A Community HUB for this population would train their case managers in the need for parenting support services and again encourage all families to participate in evidence-based parenting support services.

### **Web-based Parenting Programs to Prevent Youth Substance Use Disorder**

Parenting and family-based interventions are among the most effective way to decrease risk factors and substance use among children and adolescents exposed to parental SUD<sup>38</sup>; however, family engagement, especially for underserved families, is a challenge. The majority of families eligible for parenting interventions tend not to participate<sup>64</sup> despite efforts by program developers to decrease barriers to attendance by holding interventions in community-based settings like schools, scheduling interventions after typical work hours, and providing meals, childcare, and incentives.<sup>65,66</sup>

Online interventions are a promising way to increase access and engagement in parenting interventions. Ninety percent of adults in the United States use the internet and approximately 75% have access to high-speed internet connections in their homes, although African Americans,

Latinx, lower-income individuals, those with a high school education or less, and rural adults are less likely to have high-speed internet access in their homes and may rely on smart phones to access the internet.<sup>67</sup>

Web-based parenting interventions, including adaptations of well-established programs such as Triple P, the Family Check-Up, and Familias Unidas, have been developed and tested.<sup>57,68,69</sup> Recent systematic reviews and a meta-analysis indicate that the programs show promise in terms of parent engagement and can produce improved parenting skills, family functioning, and positive youth outcomes such as decreased behavioral problems.<sup>64,70,71</sup> These web-based parenting programs promote positive developmental trajectories likely to prevent substance abuse as children mature into adolescence and adulthood.

Few web-based parenting interventions have specifically targeted and measured substance use among adolescents as a program outcome. One exception, a gender-specific intervention for mothers and daughters, resulted in long-term increased family protective factors (more family rules, higher levels of parental monitoring, and better communication between mothers and daughters) and desired substance use outcomes among the adolescent girls (less use of alcohol, marijuana, prescription drug, and inhalants and lower intention to smoke or use drugs).<sup>72</sup> The intervention was effective for a diverse population including single-mother families, African Americans, Latinas, and Asian Americans.<sup>69–73</sup>

eHealth Familia Unidas, a culturally tailored program for Latinx families, is an adaptation of a well-established in-person, group-based intervention. The adapted program combines self-directed online parent education modules with family sessions delivered via video conference software. The intervention has resulted in less use of cigarettes, marijuana, inhalants, and prescription drugs among adolescents, as well as increased family functioning.<sup>68</sup>

Further study on the efficacy, acceptability, and uptake of web-based parenting interventions is needed to determine if these programs produce results comparable to in-person parenting interventions. If the promise of web-based parenting interventions is fulfilled and these interventions are deemed to be an efficacious and acceptable alternative to in-person programming, investments in access to high-speed internet and devices amenable to optimal participation (e.g., desktops, laptops, or tablets), especially for low-income households and rural populations, will be needed to ensure that all families have equitable access to these programs.<sup>67</sup>

### ***Education***

Instrumental to this effort is the education of professionals who work with these families about the fundamentals of brain development throughout childhood and adolescence and its susceptibility to adverse exposures and experiences, particularly proximal influences from within the home. Providing accredited courses covering the multiple impacts of caregiver SUD on development and emphasizing the need for evidence-based parenting programming to improve outcomes for both parents and their children will accomplish several goals. First, professionals who receive this information will become familiar with the early warning signs of trauma exposure expressed by children with whom they come into contact. For example, agency staff, teachers, and other professionals often do not recognize externalizing behaviors as a manifestation of maltreatment. As a result, children who engage in disruptive behaviors tend to receive harsher penalties and/or such professionals may be less receptive to providing appropriate treatment. Awareness of the signs and symptoms will facilitate the referral of these children to needed services. Second, professionals who have received this education will be more likely to employ screening tools to formally identify the source of a problem and determine the best course of follow-up. Third, familiarity with research showing that intervention has potential

to help children and adolescents recover from the detrimental impacts of early life adversity will significantly motivate professionals to take corrective action. And Fourth, an understanding of the ability to disrupt pathways to SUDs across development by providing access to evidence-based intervention will emphasize the critical importance of activating referral pipelines. Including an educational platform provides another tool in the toolbox for professionals working with these families, thereby increasing the extent to which preventive measures can be sustained.

The Brain Story – developed by the [Harvard Center on the Developing Child](https://www.harvard.edu/center-on-the-developing-child/) and offered by the Palix Foundation – exemplifies this large-scale educational approach. The Brain Story has been provided to all sectors of society in Alberta, Canada, to increase knowledge and change attitudes and behaviors in professionals, parents, and child-serving systems in the service of reducing ACEs, improving child outcomes, and building healthier communities. The course demonstrates how adverse experiences at sensitive stages of development change the brain in ways that can increase risk for later physical, behavioral, and mental health problems, including delinquency and substance abuse. It covers best practices in children's mental health and adult addiction treatment and highlights the principles of evidence-based interventions that align with brain science; e.g., using a 2-generation approach and treating the whole family. The goal is to increase understanding of the importance of providing parenting support to these families and the ability of these professionals to offer evidence-based parenting interventions; The Palix Foundation has found that when professionals in a community complete The Brain Story, they form an infrastructure that supports and utilizes evidence-based practices and programs (<https://www.albertafamilywellness.org/resources>).

Initiatives to increase knowledge and change attitudes and behaviors regarding the needs of children of caregivers with SUD have potential to achieve the following outcomes through

wide-scale implementation of such an educational model:

1. Raise awareness about the prevalence of exposure to adverse childhood experiences (ACEs) and its impact on child and adolescent brain development. (Knowledge)
2. Help change the public's perception of children labeled as "angry, bad, withdrawn, or acting out" to seeing them as kids who "have been hurt and need our help." (Attitude)
3. Reduce stigma associated with children's misbehavior related to ACEs by teachers and professionals working in child-serving agencies/organizations. (Attitude)
4. Motivate adults who regularly interact with children in the school, community, and health settings to be caring, concerned, and supportive figures in the life of a child. (Behavior)
5. Guide responses to children with ACEs in schools, homes, agencies, and communities, to include systematic delivery of evidence-based programming that addresses negative consequences. (Behavior)
6. Reform policy at all levels of government to reduce exposure at the outset. (Behavior)

## **Conclusion**

Recognition of the risk factors and their developmental impacts for children of parents with SUD will direct us to more effective solutions and, therefore, wiser expenditures with potential to make a measurable dent in the problem. Importantly, numerous players need to be activated in the process of responding to the needs of this population--from teachers and community organizations to health care, juvenile justice, and child welfare systems, to policymakers.

A number of strategies will need to be considered to protect these vulnerable children from adversity and increase their resilience. Evidence-based parenting supports can be implemented as

part of publicly funded SUD treatment, with evaluation of its long-term impact on caregiver SUD recovery and developmental trajectories in children of caregivers with SUD. It will also be important to fund evidence-based parenting supports specifically for Child Protective Services-involved families where the children have experienced caregiver SUD even if the caregiver is no longer living with the children (foster and kinship foster families). Routine referrals to evidence-based parenting support can emanate from family, drug, or juvenile court when the case involves children living with an addicted caregiver. And providing a dual system of care, whereby both SUD treatment and family/parenting intervention are systematically offered to families with children expressing behavioral and mental health problems and a parent with SUD, promises to yield significant benefits.

In addition to various referral strategies, the education of professionals, teachers, the general public, and policymakers about the effects of parental SUD on children's developmental outcomes offers new tools in the toolbox for all of these constituents. Increased knowledge about the impacts of ACEs on child development and behavioral outcomes has potential to both motivate and guide the application of screening and early detection instruments that assure needed services are appropriately provided. Caregivers and professionals who support them are likelier to recognize their role in the prevention of maltreatment. We also anticipate that the stigma directed toward both caregivers and the disruptive behaviors of the children will diminish.

Removing barriers to insurance reimbursement is yet another critical facet of this work. A survey of Medicaid directors of 48 states and the District of Columbia in 2016 reported that only 12 states provided Medicaid reimbursement for parenting programs designed to help parents foster healthy social-emotional development in their children and only 2 of these states required that the programs be evidence-based.<sup>73</sup> Evidence-based parenting support programs are rarely

covered by private insurance plans.<sup>46</sup> Evidence-based parenting support and education should be considered necessary well-child care. Parenting support and education should not require a diagnosis of a mental illness in the child to be reimbursable by Medicaid or private insurance, particularly for families who exhibit risk factors for negative child developmental trajectories.

In sum, the multiple life-course conditions that influence whether an individual will develop a serious problem with substances are fortunately alterable and, in many cases, preventable. Protective conditions can be strengthened, while detrimental factors can be attenuated or even prevented. Recognition of these facts will direct us to more effective solutions and, therefore, wiser expenditures with potential to make a measurable dent in the problem. Ready access to treatment facilities, a greater number of available beds, and sufficient insurance coverage for effective treatment comprise one well-established approach for individuals who have already developed addiction. Even more promising are proactive strategies for early identification of the warning signs and preventing exposure to contributory conditions during childhood. True improvements in our nation's drug policies require taking a less reactionary and more preventive and rehabilitative approach informed by science.

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