Systems-Level Implementation Considerations

Coordinating a thoughtful cross-sector response to address toxic stress as a health condition represents an emerging, evidence-based clinical innovation. By deploying a well-formulated public health approach to prevention, screening, and treatment through the ACEs Aware initiative and coordinated cross-sector efforts, the state of California aims to cut the burden of ACEs and toxic stress in half in the next generation.

This report has provided the evidence to support a broad effort to finance and implement a coordinated response system for intervening on toxic stress across California.

Screening for and responding to toxic stress in primary care addresses a significant upstream root cause for myriad poor health and social outcomes, enhances family and community resilience, and can help advance health equity. Such cutting-edge clinical innovation relies on well-coordinated, rigorously designed implementation science and quality improvement (QI) principles and efforts.[1562-1570] Success requires integration of complementary efforts across systems partners, including primary care providers, mental health and social service providers, and cross-sector leaders, including in education, justice, early childhood, public health, social services, and entities that regulate and pay for services. Cross-sector trauma-informed and toxic stress-responsive training for all relevant workforces is essential.

Across the spectrum of desired goals—prioritizing prevention, catalyzing practice transformation, and fostering research and innovation—specific implementation strategies emerge as crucial to success (**Figure 34**). Prevention involves a sustained plan of action to promote safe, stable, nurturing relationships and environments and to address the structural determinants of health and well-being through evidence-based policies and programs.[23,31] These efforts require coordinating the expertise of myriad community and ecological partners into a thoughtful network of care and response. Practice transformation requires universal screening for

Figure 34. *The spectrum of coordinated interventions needed to achieve prevention, practice transformation, research, and ongoing innovation. Reproduced with permission from the Center for Youth Wellness.*[1532]

ACEs to identify risk for toxic stress, effective referral systems, a comprehensive and coordinated service array, and adequate payment for these services.

This report has provided the evidence to support a broad effort to finance and implement a coordinated response system for intervening on toxic stress across California. This includes creating methods for continuous QI, promoting trauma-informed and patient-centered medical homes, reimbursement strategies, addressing adequacy of mental healthcare services, innovating on data-sharing and integration platforms, deep provider engagement and training, implementation of best and promising practices, avoiding unintended harms, expanding available networks of referrals and supports to address toxic stress, and supporting systems-level policies to coordinate these resources. Effective implementation requires alignment of health services, health delivery, and allied service systems.

ACEs Aware is guided by the best evidence to date and incorporates rigorous analysis and planning to bring to bear the substantial body of science on effective interventions to address the myriad impacts of ACEs and toxic stress. A secondary aim is to advance the knowledge base in regard to clinical approaches to screening and coordinated cross-sector responses for toxic stress, utilizing QI and qualitative inquiry methodologies through the California ACEs Learning and Quality Improvement Collaborative (CALQIC). Further, ongoing investment in research is an important part of the pipeline, as exemplified by the $9 million investment in the California Initiative to Advance Precision Medicine, to hone precision medicine approaches for advancing diagnostic and therapeutic capabilities to address toxic stress.[337]

SYSTEMS FOR QUALITY IMPROVEMENT

ACEs Aware seeks to embed thoughtfully designed strategies around coordinated data gathering, evaluation, dissemination, and continuous QI among key partners. CALQIC serves as a centerpiece of ACEs Aware. This 18-month public–private partnership is focused on rigorously and iteratively studying implementation of

ACE screening and response in 53 clinics in seven diverse California regions. Led by the University of California, San Francisco, with partners at the RAND Corporation and the Center for Care Innovations, CALQIC methodically assesses best practices and monitors for adverse events to inform the next phases of implementation and learning, with a focus on promoting health equity. Participating organizations receive on-site and virtual coaching, technical assistance, site visits to exemplar organizations, and grants. The CALQIC network was designed to drive QI at scale for intervening upon and stemming the crisis of ACEs and toxic stress, while surfacing and responding to unintended consequences. Authentic community engagement, a health-equity lens, and awareness of historical and ongoing disparities are vital components at every stage of program implementation (see **The ACEs Aware Initiative**, earlier in Part III, for more details).

ACEs Aware seeks to accelerate adoption and spread of best practices to advance successful prevention, screening, and treatment for the impacts of ACEs and toxic stress in the healthcare setting. Innovation theorists often classify adopters of new practices into five categories: innovators, early adopters, early majority, late majority, and laggards (**Figure 35**). Once innovators and early adopters have embraced a change, they pave the way for the early majority by problem-solving and persevering through obstacles to implementation and sharing their learnings. Subsequently, as those in the early majority experience the benefit of the innovation, they serve as proof points to demonstrate efficacy of the innovation, and in so doing, induce the late majority.[1566] Using these principles of

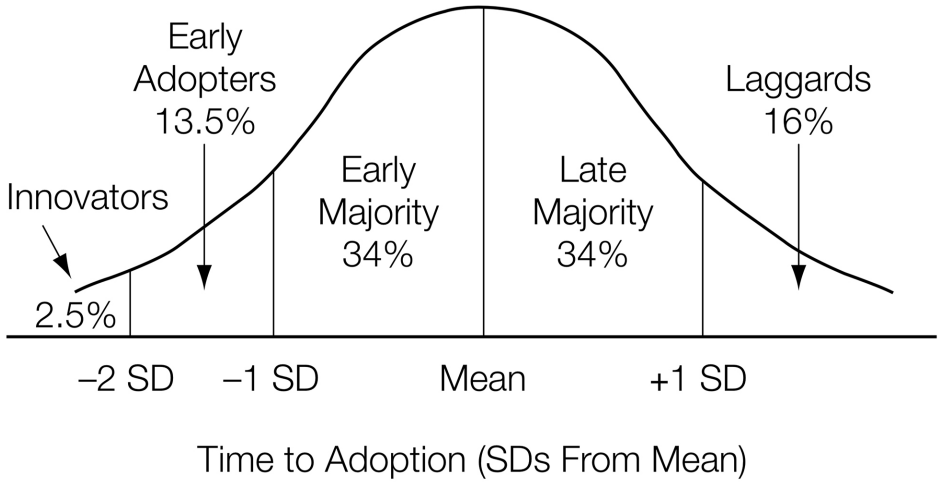

Figure 35. *Innovation adopter categories. Reproduced with permission from JAMA. 2003. 289(15): 1969-1975. Copyright © 2003 American Medical Association. All rights reserved.*[1566]

innovation diffusion, ACEs Aware is finding and supporting innovators, investing in early adopters, and facilitating visibility and shared learning through grant funding, training and capacity-building, communications strategies, and through its learning collaborative (CALQIC).

Trauma-informed practice and the Patient-Centered Medical Home model

The medical home philosophy emphasizes primary care coordination that is patient-centered, accessible, culturally competent, and focused on comprehensive, high-quality support.[1571] The capacity for a medical home to become a trauma-informed, multidisciplinary system is a foundational building block of this initiative. Universal implementation of **trauma-informed care** (TIC) improves care for all patients, but especially for those with a history of adversity.[659] Its principles support a strengths-based and non-judgmental approach to toxic stress assessment and intervention, and help prevent inadvertent re-traumatization of patients. Providers can also empathize, motivate, and empower patients or clients with active listening skills and motivational interviewing techniques.[660,661] TIC is therefore beneficial for all patients, providers, and staff. The TIC framework, adapted by ACEs Aware from the Substance Abuse and Mental Health Services Administration with an enhanced focus on the health impacts of adversity, involves the following key principles:[659,664]

1. Establish the physical and emotional safety of patients and staff.
2. Build trust between providers and patients.
3. Recognize and respond to the signs and symptoms of trauma exposure on physical and mental health.
4. Promote patient-centered, evidence-based care.
5. Ensure provider and patient collaboration by bringing patients into the treatment process and discussing mutually agreed-upon goals for treatment.
6. Provide care that is sensitive to the patient's racial, ethnic, and cultural background, and gender identity.

Another key element in trauma-informed care is self-care. Just as all healthcare workers are trained in measures of infection control to limit risk of contracting a communicable disease, all staff working with trauma-exposed patients must also learn to recognize and attend to compassion fatigue, secondary or vicarious trauma, and burnout.[628,1046,1572] A recent study found a 2.5-fold increased risk of burnout for physicians with four or more ACEs.[1573] Practicing compassionate resilience to maintain provider well-being while caring for patients is an important step for combatting staff compassion fatigue, burnout, secondary traumatic stress,

vicarious trauma, and other workforce concerns. Systems must be in place to help support the health and well-being of staff who are implementing ACE screening as a tool for identifying risk of toxic stress and applying evidence-based staff interventions like supportive coaching to enhance the success of their clinicians and reduce risk of turnover.[1574]

These principles can be used within the Patient-Centered Medical Home (PCMH) model to create a safe and healing experience for children, families, and adults who have experienced ACEs.[56,1040,1575] PCMHs dedicated to preventing and healing toxic stress should train all staff in TIC principles, and how to clinically assess risk for and intervene on toxic stress physiology, and in doing so, provide care coordination for a range of clinical and community interventions and resources within an integrated, multidisciplinary system of care (see **Primary and Secondary Prevention Strategies in Healthcare** and **Tertiary Prevention Strategies in Healthcare** in Part II for more details).

California's existing PCMH infrastructure and transformation efforts can be leveraged to meet the prevention, early intervention, and healing goals of toxic stress screening.[1576-1578] Key PCMH components relate to access to care, teamwork, and the technology to coordinate referrals, data, and care.[1579] Attention is also needed in regard to developing an organizational climate that encourages implementation optimization and use of evidence-based interventions in PCMH settings.[1564,1580] Yet even with these structural elements in place, research shows that patients and families often do not experience care or the outcomes intended for the PCMH model.[1576] Several key competencies for optimized outcomes are required:

- Establish *safe environments and trusting, ongoing relationships* between clinical care teams and patients so families can feel safe when they disclose personal experiences and know they can count on clinical teams for their care.
- Conduct and anchor care to *whole person and integrated screening and assessments* of patient and family risks, needs, strengths, and context, including conditions and resources in their communities.
- Engage patients and families in relationship-centered, *shared decision-making* discussions that prioritize goals and troubleshoot problems so families can take steps toward prevention and healing.
- Conduct pre-visit planning to prepare and *optimize encounter time* to implement brief interventions, such as personalized education and counseling.
- Establish *relationships and coordination methods with the wraparound*

services and additional treatment to support patients and families in need so that referrals are successful and follow-up and integration of care is achieved. This includes supporting behavioral health integration and multidisciplinary approaches within the clinic, as well as expanding access to external resources through the development of networks of care.

A systems-level approach to support trauma-informed, patient-centered medical homes would include (a) funding and incentives for best practices; (b) creating, disseminating, and coordinating efforts to expand this model across federally qualified health centers in California; (c) creating performance measurement standards and requirements, (d) offering free provider trainings with Continuing Medical Education (CME) and Maintenance of Certification (MOC) credit;[1555] and (e) supporting QI efforts.

Systems–level changes

State and local policymakers, payers, and leaders of community collaborations can contribute to the success of California's vision to reduce ACEs and toxic stress by half in a generation by coordinating the many interlocking systems, policies, funding streams, and programs that affect the capacity of California's healthcare providers and communities. This coordination will advance successful screening for, preventing, treating, and healing the impacts of ACEs and toxic stress. Such alignment of activities is key for effective implementation and sustainment.[1564]

To support the systems-level changes needed to effectively prevent and address ACEs and toxic stress, ACEs Aware is using the following strategies.

Creating standardized clinical workflows and algorithms to guide screening and response.

ACEs Aware has developed screening workflows and toxic stress risk assessment and response algorithms for both pediatric and adult care.[737] These clinical algorithms were developed to standardize clinical assessment and approaches to addressing risk of toxic stress to improve the quality of patient care. Recommendations include patient education on toxic stress and strategies to regulate the stress response as an adjunct to usual care for ACE-Associated Health Conditions (AAHCs), including: supportive relationships; high-quality, sufficient sleep; balanced nutrition; regular physical activity; mindfulness practices; access to nature; and appropriate mental and behavioral healthcare (especially in the context of integrated primary care and behavioral health where available) as needed.[603,704,1035] Coordination with other sectors, such as schools, child care, justice, welfare, and public health, can be done sustainably when providers leverage the healthcare team.[686-688]

Providing grants to support providers and build their capacity.

ACEs Aware awarded $14.3 million in grants to 100 organizations in the areas of provider engagement, training, and communications, in order to deepen engagement and encourage the proliferation and sharing of best practices and strategies.

Building and supporting functional networks of care.

ACEs Aware is creating a Network of Care Roadmap to improve collaboration and coordination across the healthcare and cross-sector systems to address toxic stress. Networks of care can be locally established between health plans, health centers, clinicians, and clinical and community organizations in addressing ACEs and toxic stress in primary care.

In addition to providing payment, training, and implementation support, the success of the ACEs Aware initiative also requires supportive "top-down" policies and the integration of requirements related to ACE screening, such as:

- Evidence-based or evidence-informed screening and preventive care guidelines related to toxic stress and care management in the context of specific AAHCs;
- Performance metrics and performance feedback to drive continuous QI in prevention, identification and response to ACEs, toxic stress, and AAHCs;
- Programs to identify and financially reward providers and clinics that are meeting or exceeding performance metrics to incentivize high quality of care for ACEs, toxic stress, and AAHCs (value-based purchasing programs);
- Continuing to offer ways to meet provider maintenance-of-certification requirements through continuing education on screening for and addressing ACEs and toxic stress;
- Population health management strategies to identify and focus care for patients at higher risk due to ACEs and toxic stress;
- Effective use of the electronic medical record (EMR) to streamline care for ACEs, toxic stress, and AAHCs;
- Implementation of increasingly effective and relevant evidence-based interventions for preventing, screening for, and responding to ACEs and toxic stress, through investment in toxic stress research and clinical innovation; and
- Support for building system capacity to deliver appropriate targeted services to meet patient and family needs arising from exposure to ACEs and toxic stress.

Billing and referrals to comprehensive services

Currently, ACEs Aware reimburses trained providers to screen for ACEs in primary care and other specified settings. Also important is the alignment of diagnostic services and billing codes to ensure that providers can receive reimbursement for addressing the needs and opportunities to promote healing that are revealed through ACE screening. A systems-level approach is required to consider and facilitate enhanced models of care, payment models for preventive visits, acute hospital and emergency room visits, and resources for individuals with emergent and/or chronic conditions. Creating diagnostic and service codes for symptoms of toxic stress physiology, such as AAHCs, with EMR prompts, will help improve coordination of care, reimbursement for services, and QI measurement.

Currently, clinicians can only choose a diagnostic code for physical, mental, or developmental health diagnoses; they cannot add a unifying diagnosis of toxic stress physiology. This may limit interdisciplinary and root-cause approaches to the medical management of AAHCs, and inhibit efforts to provide trauma-informed and healing-centered interventions.[64] These intervention approaches could target the root impacts on the nervous system, immune system, endocrine system, metabolic systems, and/or genetic regulatory systems.[6-8,11,12,603,1420,1581] Shifts in diagnostic and billing codes for AAHCs and different clinical risk levels for toxic stress, combined with enhanced payment models to support brief interventions, care coordination, referrals, and frequency of follow-up, will enable more effective and coordinated action to prevent and heal the impacts of ACEs.

From a systems perspective, strengthened closed-loop referral systems are necessary to help enact evidence-based interventions for toxic stress mitigation in children, adults, and families. The goal is for patients to be able to seamlessly access appropriately targeted services that can interrupt or mitigate the toxic stress physiology. This will also require enhanced availability of the comprehensive services to address ACEs, toxic stress, and accompanying social determinants of health that can be coordinated through a primary care home, especially in rural and underserved communities.

Intervening on toxic stress requires a coordinated and often multidisciplinary approach. In addition to the primary care provider, there are important roles for, among others, educators, wellness navigators, care coordinators, home visitors, peer support, and referrals are often needed to services such as biofeedback, neurofeedback, mindfulness, meditation, nutritional support, parenting support, and behavioral health services like psychotherapy and psychiatry.[722,1035,1582,1583] In adopting medical home principles, practices and hospital systems should start to identify and amplify their multidisciplinary partners and local referral networks.

Resources and services could include linkages to economic supports, legal supports (including medical-legal partnerships), high-quality evidence-based home visitation services, child care, preschool and school enrichment with family engagement, and parenting or family relational skill-building.[23,31,685,1584,1585]

Policies that allow for the credentialing and/or compensation for non-licensed professionals and non-medical supports could be helpful. Many roles contribute to optimal results, including care coordinators, health educators, patient navigators, and family-to-family and peer-to-peer professionals who are also experts in (1) healthy parenting and establishing healthy parent–child attachment, (2) strategies to coach and activate patients in self-care, and (3) evidence-based trauma healing approaches that build resilience, including fostering healthy responses to stress, restoring a healthy sense of self, and supporting positive relational skills often diminished through exposure to ACEs. Nonmedical certification programs are largely absent in behavioral health, unlike for geriatric care.[1586]

MENTAL AND BEHAVIORAL HEALTH WORKFORCE

It is important to note that most patients with non-neuropsychiatric manifestations of toxic stress will not require a mental or behavioral health referral. However, for those who do require this set of resources, there are some relevant considerations to be made.

In 1991, public mental health services in California shifted to a decentralized system whereby counties became the primary providers for Medi-Cal and uninsured, low-income clients. Through a mix of federal matching funds, Mental Health Services Act funds, and other local revenues, local mental health plans provide a range of services, including inpatient treatment, adult residential treatment, day rehabilitation, case management, and crisis intervention, among others. The Affordable Care Act increased access by deeming behavioral health as one of 10 essential health benefits. California chose to cover all essential health benefits, resulting in a substantial expansion of behavioral health services. At that time, most low-to-moderate-intensity behavioral health services shifted to the responsibility of Medi-Cal managed care plans, leaving counties to continue to provide services for adults with more intensive conditions. Although progress has been made in insurance coverage for behavioral services, there remains a shortage of behavioral healthcare workers to satisfy the growing needs, especially in low-density regions of the state like the Inland Empire and the San Joaquin Valley.[1587] The coronavirus disease 2019 (COVID-19) pandemic has further increased the demand for behavioral health professionals.[1588]

In 2016, there were just over 80,000 licensed behavioral health professionals

in California. Many current license holders are close to retirement; 45% of psychiatrists and 37% of psychologists are over the age of 60.[1587] There is an urgent need to invest in building and fortifying a racially and ethnically diverse behavioral health workforce and to ensure equitable regional distribution, possibly by harnessing the potential of technologies such as telehealth.[1589]

Integrated primary care and behavioral health within the same settings is one promising model[686-688,1035] and should be a key goal of statewide efforts. Though models that allow for warm handoffs and true interdisciplinarity in care planning are the gold standard, there are other ways to expand access to behavioral and mental healthcare when it is needed. These include supporting primary care providers to prescribe psychiatric medications for uncomplicated patients under the guidance of psychiatrists, via telehealth or other consultation. This practice requires education efforts that help primary care providers acquire the knowledge and skills as well as attend to their attitudes around mental health interventions and evidence-based medicine.[1590,1591] California's expansion of reimbursement for telehealth-provided services will provide payments comparable to in-person visits and opens the opportunity for greater coordination between behavioral health and primary care providers.[1592]

DATA SHARING AND INTEGRATION

EMR technology presents challenges as well as opportunities for any healthcare innovation or transformation. Under privacy and security laws, health data are heavily regulated to protect the collection and sharing of individuals' information within and across systems. In addition, data are collected in many different formats, creating obstacles to simple transfers from one program to the next.[1593] Currently, over 85% of office-based physicians use an EMR system.[1594] Though they can increase administrative burden,[1595,1596] EMRs have been associated in several studies with reductions in medication errors, improved health system costs, and improved communication among providers, patients, and other clinicians.[1597-1599]

Novel frameworks are beginning to capture the cross-sector and cross-disciplinary data needed to track ACEs. For example, the Semantic Platform for ACEs Surveillance integrates information streams from multiple sources, including databases and the literature.[1600,1601] By overcoming interoperability challenges, the system aims to assist clinicians, public health agencies, social services, and researchers in studying ACEs and toxic stress, delineating clinical and population-level trends, and coordinating and carrying out preventive or therapeutic strategies. Other efforts focus on providing patients with data-sharing platforms to complete screening tools and share data with providers voluntarily in ways that do not violate privacy or confidentiality regulations, such as the Well-Visit Planner and the CHADIS.[1602,1603]

Platforms for electronic prompts for features of screening and response to toxic stress, such as assessing for presence of AAHCs, and patient education materials, would streamline care. The sharing of key data across the services and programs that are part of the care team would amplify efficiency and positive outcomes.[1604] This is especially important in order to avoid multiple and uncoordinated efforts to screen the same child or adult for ACEs across different service providers and programs. This is also important to coordinate the care of families receiving care separately, for example, in the child and adult health systems. As noted, engaging patients and families to carry and share their own data as they wish is one option to consider. Assessment of methods to enable this option is underway.

In addition to improving patient care, robust data-sharing systems are needed to advance scientific investigation of ACEs, toxic stress, and AAHCs. Optimized data systems are ones in which data are discoverable (so users can find what they need), open (with open and timely access to data), linked (readily associated with related and supporting data, to enable insightful understanding), useful (presented in a compelling, understandable way), and safe (from deterioration, hacks, or becoming obsolete). Because successful data-sharing systems will require participation across multiple sectors, development and management of effective data systems is complex. Developing and maintaining optimal data systems will require communication not just across the sectors involved in advancing the science of ACEs and toxic stress, but also between data users and data system developers, employing a flexible, collaborative approach.[1604]

California also has a wide array of community-based city, county, and regional initiatives that foster a shared vision for well-being and healing, with sustainable cross-agency and cross-sector collaboration to integrate and improve health, education, justice, early childhood, public health, and social services. Increasingly, innovations are emerging to braid and blend funding in ways that optimize the availability, efficiency, and effectiveness of services (see **Part II**). One example is the Handle with Care initiative, currently being implemented in two California counties, which helps law enforcement communicate with schools when children are present at the scene of a traumatic encounter (such as a domestic disturbance). Without communicating any confidential information, the program enables the child's school to be notified that he or she should be "handled with care" and engages educational personnel to surround the child with extra precautions in days that follow a traumatic event to prevent further harms. Such cross-sector initiatives will play a central role in the systems coordination required to successfully recognize, prevent, mitigate, and heal the population-wide and intergenerational impact of ACEs and toxic stress in California.