

Clinical Implementation Case Studies

Given the significant prevalence, health consequences, and costs of Adverse Childhood Experiences (ACEs) and toxic stress, the science must be translated into widespread clinical assessment and response in order to improve health outcomes at a population level.^{2,15,16,27,30} The current literature captures many examples of successful integration of ACE screening in various clinical settings, including pediatric primary care,^{56,722,727-733} adult primary care,^{734,735} family medicine,⁷³⁶ and prenatal care.^{678,679} ACE screening is documented to be acceptable to both patients and providers, and emerging evidence shows that it may actually improve patient trust in providers and satisfaction with the healthcare experience, in part because it serves as a welcome bridge to needed prevention and buffering interventions such as parenting, economic, legal, educational, and logistical supports.^{678,697,725,731,736,739,794}

As clinical sites work to integrate approaches to mitigating ACEs and toxic stress, current successful clinical implementation efforts of early adopters provide key insights and can help promote the diffusion of this innovative approach. Information gathered in interviews conducted from April to June 2020 with implementation leaders at diverse clinical sites are featured here as case studies, which summarize the sites' unique characteristics and innovations in the realms of provider and staff training, integration of ACE screening and response, and systems change and/or integration. Key metrics (if available), challenges and opportunities (including those related to the coronavirus disease 2019, COVID-19, pandemic), and next steps are also highlighted.

The seven implementation case studies (**Table 11**) presented in this section were selected based on depth and breadth of clinical experience in addressing ACEs and toxic stress, ensuring an adequate variety of practice settings, patient populations, and provider types, as well as a preference for California-based examples (all but one are based in California) to enhance local learning.

Table 11. Summary characteristics of implementation case study sites in ACE screening and response.

Abbreviations used:

ACEs: Adverse Childhood Experiences

BRFSS: Behavioral Risk Factor Surveillance System

CALQIC: California ACEs Learning and Quality Improvement Collaborative

EMR: Electronic medical record

FQHC: Federally qualified health center

NPPC: National Pediatric Practice Community on ACEs

PEARLS: Pediatric ACEs and Related Life-Events Screener

SHARK: Strong, Healthy, and Resilient Kids

Site Description	Who/How Screened	Response	Findings
<p>Southern California Permanente Medical Group (SCPMG)</p> <ul style="list-style-type: none"> • Large integrated managed care • Pediatric patients in six clinics • Diverse in race/ethnicity and socioeconomic characteristics • Led by Mercie DiGangi, DO 	<ul style="list-style-type: none"> • Children at 3-, 5-, 10- and 13-year-old well-child visits • De-identified paper screen based on original ACE study tool³ (but the provider asks the patient/family if they are willing to disclose their specific ACEs) • Moving to PEARLS by Spring 2021 • Results entered in EMR • Began: 2018 	<ul style="list-style-type: none"> • Patients with ≤ 1 ACE receive handout on ACEs, resilience, stress reduction, and positive parenting • Patients with ≥ 1 ACE and AAHCs offered referral to social medicine team and connected to SCPMG or community behavioral health services or parenting class 	<ul style="list-style-type: none"> • Published findings:⁷³³ • More than 7,000 children screened • More than 99% of patients who received the screen completed it • Prevalence of ≥ 1 ACE increased with age: 15% in 3-year-olds, 17.5% in 5-year-olds, 30.5% in 10-year-olds, and 33.8% in 13-year-olds • Among all ages, the prevalence of ≥ 4 ACEs was very low ($\leq 2.4\%$) <p>From case interview:</p> <ul style="list-style-type: none"> • Does not prolong visits • Provides new information • Increases the quality of patient-provider relationships • Is appreciated by families • No adverse events or patient safety concerns

Site Description	Who/How Screened	Response	Findings
<p>Los Angeles County Department of Health Services (LAC-DHS)</p> <ul style="list-style-type: none"> • Large municipal healthcare • Eight clinics (pediatrics, obstetrics, family medicine, and internal medicine) • Diverse in race/ethnicity (with large Latinx population) and socioeconomic characteristics; rural and urban • Mostly Medi-Cal, some uninsured • Led by Shannon Thyne, MD and Amy Shekarchi, MD 	<ul style="list-style-type: none"> • Children at 9-, 18-, and 30-month well-child visits • Adolescents yearly • Pregnant women at prenatal care entry • New patients upon establishing care • De-identified paper PEARLS. Identified telehealth screens. • Results entered in EMR • Began: May 2020 	<ul style="list-style-type: none"> • All patients receive handout on ACEs and toxic stress • As needed, eConsult for Behavior, Development, and Adversity, and SHARK program to provide bridge services as children transfer to community services • Social work and behavioral health for acute patient need 	<ul style="list-style-type: none"> • More than 500 screens conducted • Less than 10% of patients had >3 ACEs • Most referrals were due to positive answers to part 2 of PEARLS or optional social determinants of health questions • Resilience questions well received by patients • Currently developing data reports on screening, results, and referrals. • Plan to conduct focus groups on patient, family, provider, and staff perspectives. • Six pediatric clinics have joined CALQIC for streamlined data collection and analysis (in addition to other support).

Site Description	Who/How Screened	Response	Findings
<p>True Care (formerly North County Health Services)</p> <ul style="list-style-type: none"> • FQHC in North San Diego and Riverside Counties • Pediatrics, adult Medicine, women's health, behavioral health in 11 health centers • Large Spanish-speaking Latinx population • Led by Leon Altamirano, PsyD and Mercedes Dodge, PA-C 	<ul style="list-style-type: none"> • Children annually during well-child visits starting at newborn • Adults on establishing care • Pregnant women and partners on entering prenatal care • All patients as needed based on toxic stress symptoms • Initially used identified paper screen based on original ACE study tool;³ later transitioned to PEARLS • De-identified data entered in EMR • Began: 2014 	<ul style="list-style-type: none"> • Providers may give handout on ACEs, toxic stress, and relevant patient resources • Providers may refer to True Care behavioral health provider, who may meet the patient on-site for warm handoff • Case managers and care coordinators also help address patients' social determinants of health 	<p>Internal data collection:</p> <ul style="list-style-type: none"> • About 90% of providers have completed the online Becoming ACEs Aware in California Core Training <p>From case interview:</p> <ul style="list-style-type: none"> • No adverse events or patient safety concerns

Site Description	Who/How Screened	Response	Findings
<p>Sutter Health</p> <ul style="list-style-type: none"> • Large integrated healthcare system • Sacramento multispecialty clinic • Predominantly White, diverse in age • Internal medicine clinic • Led by Michael Flaningam, MD and Andrew Factor, MD, MPH 	<ul style="list-style-type: none"> • Adults who have symptoms or health conditions that may be related to toxic stress • Identified paper screen based on original ACE study tool³ • Began: 2019 	<ul style="list-style-type: none"> • Supplement usual care with education on stress and its relationship to ACEs, stress management strategies, and reinforcing patients' existing self-care practices • May refer to behavioral health services, mind-body therapies, stress-management resources 	<p>From case interview:</p> <ul style="list-style-type: none"> • Has helped provide better care • Has increased patients' self-awareness and self-care • Significantly decreased burnout in participating providers

Site Description	Who/How Screened	Response	Findings
<p>Santa Rosa Community Health (SRCH)</p> <ul style="list-style-type: none"> • FQHC in Sonoma County • One school-based teen clinic; one pediatrics clinic • Large Latinx population, many Spanish-speaking, immigrants, and/or work in agriculture • Led by Deirdre Bernard-Pearl, MD, • Meredith Kieschnick, MD, and Luisa Ramirez 	<ul style="list-style-type: none"> • Children annually during well-child visits starting at 4 months (if <12 years, parents also screened) • Teens screened upon establishing care and annually • Identified paper screen based on original ACE study tool³ (plus eight questions on resilience/protective factors) • Results entered in EMR • Began: 2013 	<ul style="list-style-type: none"> • Patients (and parents with ACEs) offered resources based on specific needs. • Providers can refer to integrated behavioral health services, on-site trauma-informed parenting program, parenting program for Spanish-speaking families, community-based parenting groups 	<p>Internal data collection:</p> <ul style="list-style-type: none"> • Over 15,000 ACE screenings conducted <p>From case interview:</p> <ul style="list-style-type: none"> • Families appreciate being screened for ACEs • Screening adolescents privately has led to increased disclosure of ACEs • No adverse events

Site Description	Who/How Screened	Response	Findings
<p>Dartmouth CO-OP Primary Care Practice-Based Research Network (Dartmouth CO-OP PBRN)</p> <ul style="list-style-type: none"> • New Hampshire, Vermont, and Maine practice network focused on healthcare research • Family medicine practice in one university-affiliated clinic, one FQHC, and one private practice • Rural, predominantly White; diverse socioeconomic characteristics • Led by Patricia Glowa, MD 	<ul style="list-style-type: none"> • All patients >18 years attending non-acute visits during 2-week pilot • Identified paper screen based on original ACE study tool³ • Began: 2015 (two-week pilot) 	<ul style="list-style-type: none"> • Patients offered resources based on specific needs • Resources varied by site (for example, university-affiliated site had some behavioral health services and care coordinators who could refer patients to psychiatry or community resources) 	<p>Published findings:⁷³⁶</p> <p>100% of patients who received the screen completed it</p> <p>62% of patients had ≥ 1 ACE, and 22% had ≥ 4 ACEs</p> <p>≥ 4 ACEs were found in 10% of patients at prevention visits, 30% of patients at chronic illness visits, 33% at other nonacute visits</p> <p>Providers felt that the screen did not interfere with visits, the screen was acceptable to patients, and the screen provided new information</p> <p>Visit length was increased by ≤ 5 minutes in 91% of visits with patients with ACEs</p> <p>From case interview:</p> <ul style="list-style-type: none"> • No adverse events or patient safety concerns

Site Description	Who/How Screened	Response	Findings
<p>Kaiser Permanente Northern California (KPNC)⁶⁷⁸</p> <ul style="list-style-type: none"> • Large integrated managed care • Two obstetric clinics • Diverse in race/ethnicity and socioeconomic characteristics • Led by Tracy Flanagan, MD, Carey Watson, MD, and Kelly Young-Wolff, PhD, MPH 	<ul style="list-style-type: none"> • English-speaking pregnant patients ≥ 18 years at 2nd or 3rd prenatal visit between 16 and 23 weeks gestation • Identified paper screen based on BRFSS Questionnaire (plus Connor-Davidson Resilience Scale) • Began: 2016 (four-month pilot) 	<ul style="list-style-type: none"> • All patients received handout on KPNC and community-based resources, such as support groups and classes on depression, anxiety, stress-reduction, and parenting • Providers could refer to KPNC mental/behavioral health services 	<p>Published findings:</p> <ul style="list-style-type: none"> • 88% of patients who received the screen completed it • 54% of patients had 0 ACEs, 28% had 1-2, and 18% had ≥ 3 • Most patients felt comfortable completing the screen and discussing ACEs • Providers' comfort with ACE screening and response increased after the pilot • Providing adequate training, streamlining workflows, including resilience screening, and ensuring the availability of patient resources were important factors in providers' willingness to screen <p>From case interview:</p> <ul style="list-style-type: none"> • Few patients required or desired behavioral health services during the pilot

Key learnings from the seven case study sites are highlighted below, grouped thematically. Relevant corollary findings from the literature and information about ACEs Aware recommendations and tools are incorporated where appropriate.

IMPLEMENTING SYSTEMS CHANGE

Case study sites obtained initial buy-in for implementing ACE screening and response from institutional leadership, providers, and staff by presenting data on the health impacts of ACEs and toxic stress. They aligned ACE screening with existing institutional efforts to implement trauma-informed, integrated care to address the health impacts of ACEs and also co-address social determinants of health. For example, True Care implemented ACE screening as a part of an organization-wide initiative to promote integrated care, which included embedding behavioral health providers within each clinical site and service line. Training and engaging leadership is a key element of organizational change in trauma-informed care, which ACEs Aware recommends for all primary care practices.^{659,664}

Some case study sites collaborated with external partners for technical and/or funding support. For example, the implementation team at LAC-DHS partnered with First Five LA in the creation of the SHARK program, where specialists in childhood trauma, mental health, behavior, and development collaborate to provide temporary bridge services as children transition to community-based services that may take longer to establish. Six LAC-DHS pediatric clinics have joined the California ACEs Learning and Quality Improvement Collaborative (CALQIC). SRCH also joined the CALQIC, and it obtained an ACEs Aware Supplemental Provider Training grant to support its trauma-informed, ACE screening efforts.

Systems integration

Case study sites engaged both providers and staff to develop ACE screening and response workflows that could be adapted to different clinical settings. Developing these workflows was often an iterative process that incorporated evolving provider and staff feedback. For example, the implementation team at the SCPMG worked with the National Pediatric Practice Community on ACEs (NPPC)⁷⁴¹ to develop a clinical workflow that was piloted by staff at one site and adapted to the others.

Integration of ACE screening results in the electronic medical record (EMR), and electronic prompts for features of screening and response to toxic stress, such as presence of ACE-Associated Health Conditions (AAHCs), and patient education materials, helps streamline care. Four of the seven case study sites (SCPMG, LAC-DHS, True Care, and SRCH) integrated the screening results into their EMR, which was helpful in monitoring screening data longitudinally.⁷³³ The other three sites (Sutter, Dartmouth CO-OP PBRN, and KPNC) did not. (Dartmouth CO-OP PBRN

only piloted ACE screening for two weeks, and incorporation into the EMR was not part of that effort.) KPNC reported that clinicians at the ACE screening pilot sites felt that having ACE screening results integrated into the EMR would make screening more accessible and also make tracking impacts of interventions easier, but the organization also reported that “the pros and cons of adding patient ACE scores to the EMR need to be carefully considered.”⁶⁷⁸

Some case study sites generated periodic progress reports; others did not have the capacity to systematically collect and analyze data.

Training providers and staff

Both child-serving and adult-serving providers have reported lack of confidence when asking about childhood adversity, and for a variety of reasons, current screening efforts may underestimate the prevalence of ACEs or under-recognize their associated health impacts.^{1535,1552,1553} Based on learnings from the NPPC and the Resilient Beginnings Collaborative sufficient provider training on screening for ACEs and toxic stress can not only improve provider comfort with screening, but also increase awareness of health impacts of ACEs, generate support for screening, and establish a common language.¹⁵⁵⁴

Most of the case study sites conducted training for both providers and non-clinical staff, like front desk personnel, because of their essential role in implementing ACE screening and response. The training topics included the health impacts of ACEs and toxic stress, the role of resilience and protective factors in buffering toxic stress, the screening tool and clinical workflow, principles of trauma-informed care, and patient resources. Many sites emphasized the importance of training all non-clinical staff to ensure a uniformly trauma-informed workforce. For example, True Care integrated its training into the onboarding process for all new hires. Some sites also conduct refresher courses to review concepts.

High-quality training is recognized as a critical component of successful ACE screening and response, and was thus the focus of the first phase of the ACEs Aware initiative, which included development and promotion of the *Becoming ACEs Aware in California*.¹⁵⁵⁵ Completion of this training or another approved Core Training is required to receive Medi-Cal payment for ACE screenings.¹⁵³⁸ Since the launch of ACEs Aware, many sites have incorporated the *Becoming ACEs Aware in California* Core Training¹⁵⁵⁵ into their training curriculum.

Supporting providers and staff

Case study sites recognized that providers and staff may experience vicarious trauma and burnout related to ACE screening and response. Besides including these concepts and highlighting staff resources in their trainings, some sites

developed additional supports. For example, SRCH developed a staff support group and also strives to monitor provider and staff burnout through an annual survey, which has shown stable results. Some sites developed robust technical assistance systems. For example, providers at ACE screening sites at LAC-DHS work directly with a coach during the first month of screening. They also have regular check-ins with the coach and access to a website with training materials, phone and email support lines, and an online feedback form. Consistent with the efforts of these case study sites, The Substance Abuse and Mental Health Services Administration guidelines for implementing trauma-informed care describe the necessity of having procedures in place to support providers experiencing vicarious trauma, and providing ongoing workforce training and development.⁶⁶⁴

Screening approaches and tools

Because the published research on specific screening tools for ACEs and toxic stress is somewhat limited,^{53,1539,1540} the California Surgeon General convened a clinical advisory team of subject matter experts and physicians experienced in ACE screening to review the literature and develop targeted recommendations. For pediatric ACE screening, the Pediatric ACEs and Related Life-Events Screener (PEARLS), developed by the [Bay Area Research Consortium on Toxic Stress and Health \(BARC\)](#),¹⁰⁸³ was recommended because of the rigorous research framework under which it was developed. It also enables patients' answers to be de-identified, meaning that respondents can disclose the total number of ACEs rather than specifying which ones. According to early data in pediatrics from a single large FQHC, randomization to the de-identified option invites greater patient disclosure and comfort.¹⁵⁴² PEARLS's initial development, face validation, and concurrent validation with a limited set of health outcomes are published;^{56,703} more extensive validation and outcomes evaluation⁷⁰³ are currently underway. For adult patients, a screening tool based on the original 10 ACE questions, with the questions updated, was recommended.³ As for the PEARLS, both identified and de-identified formats are available for providers in multiple languages. Data on disclosure quality, and patient and provider preference for adult ACE screening tools is more mixed than in pediatrics.^{678,734} These screening tools, the ACEs and Toxic Stress Risk Assessment Algorithms, as well as patient education materials, are available for free at [ACEsAware.org](#).⁷⁴³

As recommended by ACEs Aware, all sites except KPNC used either PEARLS or a screening tool based on the original ACE study.³ KPNC used an identified paper screen based on the Behavioral Risk Factor Surveillance System questionnaire, plus the Connor-Davidson Resilience Scale. In addition to KPNC, SRCH also asked about resilience and protective factors in eight additional questions. More detailed consideration of the impacts of identified and de-identified screening,

and screening for protective factors, is presented below under **Patient Safety, Acceptability, and Privacy Considerations.**

Case study sites varied in whom they screen for ACEs. For example, Sutter Health patients were screened as needed based on symptoms or conditions that may be related to toxic stress. True Care takes a systems-level approach and screens all children annually, adults upon establishing care, and pregnant women and their partners upon entering prenatal care. SRCH takes an intergenerational approach by also screening the parents of younger children during preventive health visits. Glowa and colleagues found that higher-risk ACE scores (≥ 4) were present in 10% of adult patients at preventive health visits, compared to 30% at chronic illness follow-up and 33% at other non-acute visits.⁷³⁶ Three sites included pregnant women in ACE screening. Screening in this population not only helps identify toxic stress-related pregnancy health risks and provide opportunities for interventions that improve pregnancy outcomes, but also offers an early intervention that could prevent toxic stress transmission to the next generation.⁴²²

ACEs Aware recommends that children be screened for ACEs and provided buffering care as early as possible, because adversity can be biologically embedded as early as the prenatal period,⁴²¹ and the signs of toxic stress can manifest even in infancy.⁷⁰⁰ Assessment for ACEs should be ongoing, starting in infancy, with the recognition that ACEs tend to accumulate. In a multisite study of children exposed to or at risk of maltreatment, Thompson and colleagues found that by age six, children had an average ACE score of 1.94. Between ages six and 12, on average, they accumulated another 1.53 ACEs, and then between ages of 12 and 16, another 1.15.⁷⁴² Thus, continuous assessment is crucial, because health risks increase in a dose-response fashion with each ACE category experienced.³ Children should thus be rescreened periodically to monitor for additional ACEs that might accumulate over their childhoods. Adults should be screened at least once in adulthood—and though ACEs occur in childhood (by definition) and therefore don't change, patient comfort with disclosure may change over time, so re-screening for adults may be considered.

Only two sites, SCPMG and Dartmouth CO-OP PBRN, tracked and reported the impact of screening on visit duration. Although time constraints were the most-cited anticipated barrier among providers completing the *Becoming ACEs Aware in California* training (71% of participants reported this concern),^{1535,1552} Dartmouth CO-OP PBRN tracked and published data on visit duration, finding that visit length increased by less than 5 minutes for 91% of visits,⁷³⁶ and SCPMG reported that ACE screening did not prolong visit length. These findings cohere with the literature, which has found little (usually adding under five minutes) or no increase in visit times.⁷³⁶ Two published studies have even found that screening for ACEs increased

efficiency of visits and actually reduced visit length.^{730,731}

Patient safety, acceptability, and privacy considerations

None of the case study sites reported an increase in patient safety concerns, adverse events or mandated reporting as a result of screening. Because potential harms of ACE screening have been speculated, but have not been well documented or systematically described, one of the goals of the ACEs Aware initiative is to rigorously assess for any potential harms associated with screening as part of the statewide 53-site CALQIC effort.

The case study sites also did not experience challenges or barriers related to patient acceptability of ACE screening and response. This finding is consistent with the literature. Kia-Keating and colleagues reported high pediatric provider and patient acceptability with 92% infant well-child visits receiving an ACEs screening. Key to parent acceptability were the screening being offered by a trusted primary care provider, and receiving immediate education about the results. Providers said ACE screening helped patients understand the connection between mental and physical health.⁷²⁹ Conn and colleagues also found that parents strongly supported ACE screening as a bridge to needed services, understood the intergenerational impact of ACEs, expressed a desire to break the cycle of adversity, and saw their child's pediatrician as a potential change agent who could help them meet their parenting goals.⁷²⁸ Adult patients in the primary care and family practice settings have also reportedly expressed comfort with being asked about childhood adversity and recognized the relevance of these questions to their current health.^{734,1536}

To enhance patient privacy, some case study sites (SCPMG, LAC-DHS, True Care) used a de-identified screening tool, which asks only for the total number of ACEs, while others (Sutter Health, SRCH, Dartmouth CO-OP PBRN, KPNC) used an identified screening tool, which asks patients to disclose which ACEs they have experienced. In a single large FQHC setting, early pediatric data show that patient randomization to use of the de-identified over the identified PEARLS format is associated with enhanced disclosure rates and patient comfort, and specifically, lower affective activation.¹⁵⁴² However, some case study sites preferred the use of an identified screen. One of the True Care providers interviewed pointed out the benefits of knowing patients' specific ACEs in order to tailor behavioral health interventions that can assist in trauma recovery. SCPMG balances the benefits of each approach by using a de-identified ACE screening tool while also encouraging patients and families to disclose specific ACEs if they feel comfortable doing so.

ACEs Aware highlights that the ACE screening tool is intended for rapid identification of risk in the primary care setting, where brevity enables routine screening of multiple patients per day. In contrast, the mental health setting typically schedules

much longer visits and is therefore conducive to tools designed to encourage more detailed disclosure of trauma histories. Thus, ACEs Aware recommends that primary care providers employ a tool with de-identified scoring as a way to be sensitive to patient comfort and facilitate fuller disclosure, particularly for children and adolescents.⁷⁴³ For those patients requiring mental health intervention, treatment planning in the mental health setting may be facilitated by a broad suite of validated tools for ascertaining a more detailed trauma history to guide individualized and targeted treatment. Clinical workflows can outline the complementary roles of primary care and mental health providers in the process of ACE screening and response.⁶⁸⁶⁻⁶⁸⁸

RESPONDING TO ACEs AND TOXIC STRESS RISK

ACE screening involves assessing for the triad of adversity (ACE score), clinical manifestations of toxic stress (ACE-Associated Health Conditions, AAHCs), and protective factors. The first two components are used in assessing clinical risk for toxic stress and all three help to guide effective responses (see more in **Primary and Secondary Prevention Strategies in Healthcare**, in Part II). The ACEs Aware initiative recommends validating existing strengths and protective factors as a key part of clinical assessment and treatment planning for patients identified with ACEs and increased risk for toxic stress.⁸⁶

The case study sites emphasize empathetic listening and building trusting relationships as crucial interventions for patients with ACEs. Patients with a history of adversity report that being listened to with compassion and understanding is one of the most important factors to facilitating their healing.¹⁵⁵⁶ Building trust between providers and patients is one of the key principles of trauma-informed care^{659,664} recommended in this report as a fundamental primary prevention approach for all healthcare settings (again, see **Primary and Secondary Prevention Strategies in Healthcare** for further discussion).

The case study sites recognized the importance of reinforcing patient resilience and strengths in their response to ACE screening. KPNC used an identified paper screen based on the Behavioral Risk Factor Surveillance System questionnaire, plus the Connor-Davidson Resilience Scale. In addition to KPNC, SRCH also asked about resilience and protective factors in eight additional questions. Inquiring about positive experiences and strengths enhances patients' feelings of empowerment and self-efficacy, and helps clinicians and staff gain specific tools to address adversity and toxic stress.¹⁵⁵⁷ Building on strengths and reinforcing resilience-based coping have been identified as important to promote healing when addressing recent and past trauma in adult healthcare,¹⁵⁵⁸ and can amplify resilience, help patients feel "known" in positive ways, and increase the likelihood that strengths

can be used during the delivery of care.¹⁵⁵⁷ A study of ACE intervention in low-income Black primary care patients using strengths-based and efficacy-promoting questions to motivate patient-identified health risk behavior change found that participants were well equipped with a variety of adaptive coping skills, numerous strengths, and high motivation to change despite having an ACE history and living in a highly under-resourced environment. The authors of the study concluded that these themes can guide trauma-informed approaches, which “can ultimately advance health equity for marginalized groups.”¹⁵⁵⁹

Case study sites varied in their interpretation of the ACE score. For example, SCPMG initially offered resources to patients with one to three ACEs and automatically referred those with four or more. However, some patients with low scores required support based on their specific experiences, while some patients with high scores did not require or desire assistance. Thus, providers now refer patients with at least once ACE to resources if they have toxic stress symptoms and want support or if the provider believes that a referral is necessary for any other reason. LAC-DHS providers gave materials related to ACEs, toxic stress, and community resources to all patients because even patients with low ACE scores had other needs (job placements, educational resources, COVID-related services, and housing/food support). The California Surgeon General’s Clinical Advisory Subcommittee conducted a comprehensive review of the scientific literature and promising practices in the process of developing [screening and response recommendations](#), including toxic stress risk assessment and response algorithms for both pediatric and adult care.⁷³⁷ These clinical algorithms synthesize current science and best practice, and help standardize clinical assessment and approaches to addressing risk of toxic stress to improve quality of patient care.

Patient and family resources

The case study sites highlighted the importance of providing patient education on the impacts of ACEs and toxic stress as a clinical intervention. Many sites created their own patient handouts on stress management, parenting tips, and other issues. The ACEs Aware initiative recommends patient education on toxic stress and strategies to regulate the stress response as supplements to usual care for AAHCs. Strategies include supportive relationships (including caregivers for children, other family members, and peers); high-quality, sufficient sleep; balanced nutrition; regular physical activity; mindfulness and meditation; and access to nature (for in-depth discussion of each, see **Tertiary Prevention Strategies in Healthcare**, in Part II).^{86,704} The ACEs Aware website also contains patient tools and informational handouts in the provider toolkit.¹⁵⁶⁰

For those with neuropsychiatric manifestations of toxic stress, appropriate mental and behavioral healthcare is also necessary. The most commonly used referral

resources for the case study sites were integrated or community-based, trauma-informed mental or behavioral health services and parenting programs. Some case study sites developed novel resources, such as the eConsult for Behavior, Development, and Adversity, and the Strong, Healthy, and Resilient Kids program at LAC-DHS.

Many case study sites emphasized the need for further collaboration with county- and community-based resources to develop local networks of care. For example, one interviewee from KPNC highlighted Nurse-Family Partnership, a home visitation program, and the Black Infant Health Program, an evidence-informed intervention that uses a group-based approach to improve infant health among Black women,¹⁵⁶¹ as important partners for preventing and addressing the impacts of toxic stress.

OPPORTUNITIES AND CHALLENGES

While most case study sites found it feasible to implement ACE screening and response with institutional support, they aspire to increase access to resources and bolster local networks of care. Due to the COVID-19 pandemic, many have experienced challenges such as increased patient stress and overall disruptions in primary care, including screening. Some case study sites found new opportunities in the pandemic, such as normalizing conversations about toxic stress and increasing telehealth capabilities (see [EXAMPLES OF CLINICAL SYSTEMS' ADAPTATIONS TO COVID-19](#)).

Many of the case study sites are planning exciting future initiatives. For example, the Dartmouth CO-OP PBRN plans to conduct a study on resilience factors among patients with ACEs, and LAC-DHS hopes to expand screening to all of its pediatric, women's health, and adult primary care, and juvenile correctional settings. Three of the sites have formally published research findings. Opportunities for the future include securing additional research funding to advance practices for screening and response for ACEs, toxic stress, and AAHCs. Longitudinal studies on longer-term impacts of clinical interventions targeting the toxic stress response are sorely needed.

EXAMPLES OF CLINICAL SYSTEMS' ADAPTATIONS TO COVID-19

The COVID-19 pandemic posed numerous challenges for case study sites, including delays across all sites and programs, increased patient and team stress, and disruptions to care, such as decreased access to medications and insurance, and difficulties in making the technology necessary for telehealth available and accessible to patients. During the height of the pandemic, when non-urgent in-person visits transitioned exclusively to telehealth appointments, difficulties were exacerbated for those most in need of screening and services: families and communities isolated by the digital divide, that is, lacking financial means to own a computer or living in areas without reliable high-speed internet or mobile network service. Even when telehealth services are accessible, not all patients may be familiar or comfortable with the process. Despite these setbacks, some early adopters found that the pandemic provided a few new opportunities, such as normalizing conversations about toxic stress and increasing providers' telehealth capabilities.

Challenges and Next Steps

Southern California Permanente Medical Group. SCPMG slowed its goal of training all pediatricians to screen for ACEs at all well-child visits. Once clinics reopened, ACE screenings restarted as part of in-person visits. The group also continues to work toward developing local coordinated-care networks and is on the way to

rolling out PEARLS screening region-wide by spring 2021.

Los Angeles County Department of Health Services. Trainings, visits, and treatment services were converted to virtual interfaces. Ultimately, the county hopes to expand screening to all pediatric clinics, women's health, adult primary care, and juvenile correctional settings.

Santa Rosa Community Health. The organization transitioned most visits to telehealth, although screening continues for younger children at in-person well-child visits. Pediatric providers were meant to complete the online *Becoming ACEs Aware in California* Core Training¹⁵⁵⁵ and trainings were to be developed for family medicine sites, but both of these efforts were paused. However, SRCH has joined CALQIC and obtained an ACEs Aware Supplemental Provider Training grant to support its trauma-informed ACE screening efforts.

Kaiser Permanente Northern California. The physician ACEs lead built on the lessons learned from the pilot to restart screening efforts at KPNC. Some sites currently screen for ACEs in routine prenatal care for English-speaking women 18 years or younger, and they are considering avenues to expand screening to other patients and sites.

Dartmouth CO-OP Primary Care Practice-Based Research Network. The physician ACEs lead plans to conduct a follow-up study to assess resilience factors among patients

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with ACEs, evaluate the utility of this information, and examine whether patients are interested in pursuing treatment related to their history of ACEs.

True Care. True Care consolidated its clinical sites and is screening for ACEs via telehealth visits. It plans to develop on-site parenting and group-therapy programs, as well, once these activities are safe. Anecdotally, it noted an increase in patients experiencing stress and mental health symptoms and was quickly able to transition

its behavioral health services to telehealth.

Sutter Health. Many providers worried about not having enough time or support to implement ACE screening. On the other hand, the ACEs physician lead at Sutter believes that, particularly in light of increased patient stress due to COVID-19, ACE implementation efforts to date have helped to normalize conversations about toxic stress.