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Overview: A Tiered Clinical Response Framework for Addressing Toxic Stress

Once the clinician has conducted the clinical assessment and determined the patient's risk for toxic stress, they should work with the patient to develop the treatment and follow-up plan. The treatment plan may include: 1) **patient education** about toxic stress and its likely role in ACE-Associated Health Conditions; 2) **intervention and support services**; and 3) **follow-up** (see ACE Screening, Clinical Assessment, and Treatment Planning for Toxic Stress).

Although treatment plans should be tailored to each patient, the implementation team can use a framework – including primary, secondary, and tertiary prevention strategies – to determine the patient education, level of intervention, and additional supports that may be needed for patients at different levels of risk for toxic stress.

A "tiered" approach to the clinical response

The clinical response starts with the clinician, but may be supplemented by the broader clinical team within the clinic and clinic system and/or by others in the Trauma-Informed Network of Care (for more information about building a Trauma-Informed Network of Care, read the Trauma-Informed Network of Care Roadmap).

Below is an overview of the tiered framework.

Tier 1 – Primary Prevention

Efforts that **prevent** harmful exposures that could lead to toxic stress from occurring, such as preventing ACEs and enhancing protective factors. Tier 1 efforts can be targeted to all patients and individuals at lower risk of toxic stress physiology.

Tier 2 – Secondary Prevention

Efforts to **reduce accumulation of risk factors** for toxic stress, such as subsequent ACEs or other stressors, before the onset of ACE-Associated Health Conditions. Tier 2 is targeted to individuals who are at intermediate risk of toxic stress physiology.

Tier 3 – Tertiary Prevention

Efforts that seek to **lessen the severity, progression, or complications** from toxic stress and ACE-Associated Health Conditions. Tier 3 is targeted to individuals who are at high risk of toxic stress physiology.

A focus on toxic stress mitigation strategies

The seven evidence-based strategies for mitigating toxic stress are focal points for education and interventions. These strategies should be relevant to the patient's interests and fit within their lifestyle. It is important to work together with the patient to determine what changes and activities might work best for them.

The seven strategies are:

- Supportive relationships, including with caregivers (for children), intimate partner, other family members, and peers/friends;
- High-quality, sufficient sleep;
- Balanced nutrition;

- Regular physical activity;
- Mindfulness and meditation;
- Experiencing nature; and
- Mental health care, including psychotherapy or psychiatric care, and substance use disorder treatment, when indicated.

Figure 1. Toxic Stress-Mitigation Strategies

Source: Bhushan D, et al. The Roadmap for Resilience: The California Surgeon General's Report on Adverse Childhood Experiences, Toxic Stress, and Health. Office of the California Surgeon General, 2020 DOI: 10.48019/PEAM8812: Gilgoff et al. Adverse Childhood Experiences, Outcomes, and Interventions. Pediatric Clinics 2020; 67(2): 259-73.

Applying a tiered approach to patient education

Patient education plays a critical role in supporting all tiers of response. While education on ACEs, toxic stress, and toxic stress mitigation strategies can occur within and outside the clinical setting, patient education is a critical part of the clinical response within the primary care ACE screening workflow.

General patient education

Given the prevalence of ACEs and other life stressors, all patients can benefit from general education about the relationship between early adversity, current stressors, and health. This education should focus on what ACEs are, what toxic stress is and how to recognize it, health conditions that can result from ACEs and toxic stress (referred to as ACE-Associated Health Conditions), and strategies for preventing and mitigating toxic stress. Review the ACEs Aware Sample Scripts for Pediatric Clinical Teams for guidance on how to talk to pediatric patients/caregivers about ACEs and toxic stress.

Tip: Educate everyone

Consider educational videos, posters, flyers in the waiting rooms, and patient materials to support general education. (Find materials you can use or adapt in the Patient/Family Education Handouts Resources section of the website.)

Tip: Incorporate trauma-informed care

The principles of trauma-informed care, including establishing trust, safety, and collaborative decision-making, should be applied universally for every patient. (Read w.)

Tip: Incorporate toxic stress-mitigation strategies

Use the ACEs Aware Self-Care Tools for Pediatrics and Adults to support conversations around toxic stress-mitigation strategies.

Anticipatory guidance

Patient education can also take the form of anticipatory guidance. Anticipatory guidance is "proactive counseling that anticipates likely upcoming concerns."[1] To be effective, it must be timely, appropriate to the patient in their specific community, and relevant so that key recommendations can be adopted by the patient.[2]

For Tier 1 (individuals considered at low risk for toxic stress):
The focus of anticipatory guidance is on how ACEs and toxic stress may impact health, ways to mitigate the toxic stress response, and the general importance of evidence-based stress mitigation strategies. For example:

6-month-old Infant Crying and Failure to Thrive Example[3]

Discuss crying patterns and toxic stress-mitigation strategies with all new parents at their first newborn appointment to prevent ACEs (such as maternal depression, neglect, or physical abuse).

The CDC Violence Prevention Division offers tools and strategies to prevent abusive head trauma that include tips for parents around infant crying. Letting parents know that caring for an infant is hard work, that it is ok to ask for help, and that while Infant crying is worse in the first few months, it gets better over time. Provide tips around rocking, swaddling, talking, singing, walking, strolling or even a riding in the car with their infant. Discuss strategies for when a infant continues to cry including checking for signs of illness, and calming yourself down. Letting parents know it is ok to put the baby down in a safe place and call a friend, relative, neighbor, parent helpline, or the clinic. However, it is also important to check on the baby every 5 to 10 minutes and to not leave a baby crying alone for an extended period of time.

Obesity Example[4]

Discuss the toxic stress-mitigation strategies — healthy eating strategies, physical activity, mindfulness, supportive relationships, experiencing nature, sleep, and mental health — with all patients to prevent ACE-Associated Health Conditions, including obesity.

For Tier 2 (individuals considered at intermediate risk of toxic stress): Anticipatory guidance focuses more specifically on reducing the accumulation of risk factors for toxic stress, such as subsequent ACEs or other stressors, or increasing toxic stress-mitigation strategies to prevent the onset of ACE-Associated Health Conditions. For example:

6-month-old Infant Crying and Failure to Thrive Example

For intermediate risk of toxic stress such as an infant whose mother has depression (infant's ACE score = 1), and the infant crying is determined to be normal for developmental age (no ACE-Associated Health Conditions), you can respond to parent complaints of the baby crying by: (1) discussing helpful ways to soothe a crying baby and regulate the infant stress-response; (2) providing anticipatory guidance around the caregiver's stress level in coping with a colicky baby to ACEs such as abusive head trauma and neglect; and (3) having a trauma-informed discussion about the importance of the caregiver receiving mental health therapy for depression.

Anticipatory guidance can include a trauma-informed discussion about ways the parent could use toxic stress-mitigation strategies including mental health to help themselves regulate such that the parent could be in a better place to soothe their baby. Phrases such as "put on your own oxygen mask first," "self-care is not selfish," and "you cannot pour from an empty cup," can all be helpful.

Obesity Example

For patients with an elevated ACE score and high-normal BMI, an example of anticipatory guidance would be to discuss how stress can biologically increase our desire for high-fat, high-sugar foods.[5] Then work with the patient to identify healthy high-fat, high-sugar foods such as fruits and nuts that they could eat when the craving hits.

From the California Surgeon General's Report: "Nutritional counseling for patients found to be at intermediate or high risk for toxic stress should include consideration of the biological drive for high-fat, high-sugar foods and the complex interplay between food, stress, and neuro-endocrine-immune-metabolic function. Any implication that dietary choices and weight gain are due solely to lack of willpower and poor personal choices is not biologically accurate. A trauma-informed approach can help decrease blame and shame and identify a more comprehensive strategy to treat eating disorders or obesity as part of a toxic stress phenotype."[6]

For Tier 3 (individuals considered at high risk for toxic stress): Anticipatory guidance focuses on lessening the severity, progression, or complications from toxic stress and ACE-Associated Health Conditions and should include discussions around evidence-based, toxic stress-mitigation strategies. (Tier 3 would most likely also involve interventions and support services as well. See next section.) For example:

6-month-old Infant Crying and Failure to Thrive Example

In the case of an infant crying in which the provider has significant concerns related to ACEs and toxic stress, such as maternal depression (an infant ACE) and failure to thrive (FTT, an infant ACE-Associated Health Condition), a higher level of care including education and anticipatory guidance will be needed.

Assuming for this case scenario that other medical causes for increased crying and FTT have been ruled out, the clinical assessment for this infant would be:

6-month-old female presenting with increased crying and failure to thrive likely due to maternal depression and toxic stress physiology. The clinician can use anticipatory guidance to help the caregiver understand

how their depression is impacting the health of their infant. The clinician can have a trauma-informed discussion about the importance of the caregiver receiving mental health therapy for depression and identifying ways to support healthy bonding with their infant (including referral to targeted dyadic therapy discussed in next section).

Examples of how to say this to mom:

"I think that because of what your daughter is experiencing, her body is making more stress hormones than it should. This may be what's affecting her growth. I want to refer you to a specialist that can help you learn how to support the two of you and reduce the amount of stress hormones that her body is making."

"We also know that a healthy caregiver is one of the most important ingredients for healthy children so an important part of helping your daughter heal will involve managing your own stress level and practicing taking care of yourself."[7]

(See the next section for interventions and support services according to this tiered approach.)

Obesity Example

For a patient with a high ACE score and obesity (an ACE-Associated Health Condition), in addition to Tier 2 advice above, the anticipatory guidance can involve motivational techniques to create concrete goals around the seven toxic stress-mitigation strategies to address toxic stress. As a provider you can help the patient understand how the 7 stress-mitigation strategies can help heal the toxic stress – the psychological, neurological, endocrine, metabolic, and immune dysregulation – that is contributing to the patient's obesity.

Examples of how to say this to the patient:

"I think that because of your past Adverse Childhood Experiences, the stress hormones in your body are telling you to get prepared for future threats – to eat high fat, high sugar foods and store up that energy in case you need it in the future. I would like to make sure you feel safe now, and to work with you on ways to ways to calm down those stress hormones."

Then transition to motivational interviewing techniques such as asking open ended questions:

"How does this sound to you?"

"Have you noticed stress being a part of your weight gain?"

"How do you manage your stress?"

"What ideas do you have for how you could lose weight?"

Make affirming statements:

"That's a good idea for how you can avoid situations where you may be tempted to eat high fat or high sugar foods."

"It is wonderful that you are getting a good night sleep because that is a great way to calm those stress hormones."

Then transition to Reflective Listening and Summarizing:

*"Okay, let me make sure I understand.
[Summarize what the patient said.]
Do I have that right?"*

Applying a tiered approach to interventions and support services

A tiered approach to applying toxic stress-mitigation strategies can also be used as a framework for considering interventions and support services that can help regulate the toxic stress response. Interventions and support services can be useful in primary and secondary prevention to help patients augment their protective factors. For tertiary prevention efforts, clinicians can use these areas of focus as a guide for which interventions may be most effective.

Interventions and support services include those that are physician-led and/or clinic-based. They could also be links to subspecialty services and external resources. What you recommend to patients will depend on the resources at your clinic and in your community – it will also help you identify where additional support services may be needed. Some examples include:

- **Physician-led interventions:** Group well-child visits to promote supportive relationships, discuss sleep hygiene or the use of medication such as melatonin if necessary, write "park prescriptions" to increase access to nature, discuss the importance of dietary strategies such as omega-3 fatty acids in decreasing inflammation, and teaching diaphragmatic breathing technique (belly breathing) as a mindfulness strategy.
- **Clinic-based efforts:** Access to integrated behavioral health, offer a parenting skill development program, offer support groups on site, and host a farmer's market in front of the clinic.
- **Subspecialty services:** Referral to a dietician, a sleep specialist, social worker, psychiatrist, psychologist, developmental or behavioral pediatrician, and medical specialists such as neurologists, pulmonologists, endocrinologists, immunologists, and gastroenterologists.
- **Community-based resources:** Connections to school- or community-based programs and social services.

Check Out ACEs Aware Resources

- Utilize the age-appropriate ACEs Aware ACEs and Toxic Stress Risk Assessment Algorithm, which provides recommendations for the clinical response and follow-up based on risk of toxic stress.
- Review evidence-based toxic stress-mitigation strategies. See Part II of the Roadmap to Resilience, published by the Office of the California Surgeon General, for interventions that can be employed at varying degrees of intensity to address a patient's toxic stress physiology.[8]
- Review the ACEs Aware Trauma-Informed Network of Care Roadmap for more information on the role of the Network of Care.

For Tier 1 (individuals considered low risk for toxic stress):
The focus of the intervention is to highlight the general importance of evidence-based toxic stress mitigation strategies. For example:

6-month-old Infant Crying and Failure to Thrive Example[9]
Universal strategies to promote parent-child bonding and stress-mitigation strategies can help all parents feel better equipped to deal with a crying infant and can prevent ACEs and AAHCs. Depending on the resources at your clinic facility and community, helpful interventions and support services for all new parents could include programs such as Reach Out and Read, Video Interaction Project, group clinic visits, local parenting classes, and other programs that bolster the "supportive relationships" toxic stress-mitigation strategy.[10] Similarly, all parents could be provided a list

with helpful toxic stress-mitigation strategies available at your clinic or in the community such as local parks, exercise programs, farmer's markets that accept Electronic Benefit Transfer (EBT), mindfulness programs, etc.

Obesity Example[11]

Depending on the resources at your clinic facility, helpful interventions and support services for all patients could include recommendations on the importance of an anti-inflammatory diet such as the Mediterranean diet, staying away from pro-inflammatory foods such as processed and fast-foods,[12] as well as links to helpful toxic stress-mitigation strategies such as local parks, exercise programs, farmer's markets that accept EBT, mindfulness programs, etc.

For Tier 2 (individuals considered at intermediate risk of toxic stress): Interventions focus more specifically on reducing the accumulation of risk factors for toxic stress, such as subsequent ACEs or other stressors, or increasing toxic stress-mitigation strategies to prevent the onset of ACE-Associated Health Conditions. For example:

6-month-old Infant Crying and Failure to Thrive Example

For intermediate risk of toxic stress such as an infant whose mother has depression (ACE = 1), and the infant crying is determined to be normal for developmental age (no ACE-Associated Health Conditions), interventions and support services could include a referral for home visiting and care coordination to connect mother with mental health treatment for her depression.[13]

Obesity Example

For patients with an elevated ACE score and high-normal BMI, a higher level of interventions and support services may be needed. This could include considering anti-inflammatory supplements such as omega-3 fatty acids to buffer risk for metabolic syndrome,[14] connecting the patient to nutritionist support, and using motivational interviewing techniques to explore other toxic stress-mitigation strategies such as taking walks with a friend (nature/ exercise/ supportive relationships), practicing self-compassion-centered mindfulness,[15] and improving sleep quality.[16]

For Tier 3 (individuals considered at high risk for toxic stress): Interventions and support services focus on lessening the severity, progression, or complications from toxic stress and ACE-Associated Health Conditions and should include evidence-based, toxic stress-mitigation strategies. For example:

6-month-old Infant Crying and Failure to Thrive Example[17]

In the case of an infant crying in which the provider has significant concerns related to ACEs and Toxic Stress such as maternal depression (an infant ACE) and failure to thrive (an infant ACE-Associated Health Condition), a higher level of care will be needed.

Assuming for this case scenario that other medical causes for FTT have been ruled out, the clinical assessment for this infant would be:

6 month-old female with excessive crying and failure to thrive likely due to maternal depression and toxic stress physiology. This infant needs a higher level of intervention and support services that can include:

- Nutritional supplementation.
- Addressing food insecurity and referring to WIC if needed

- Referring to targeted dyadic intervention such as Attachment and Biobehavioral Catch-up (ABC), Child Parent Psychotherapy, or Parent-Child Interaction Therapy (PCIT) to support the caregiver and the infant's health and well-being.[18]
- Addressing potential sleep disorders or problems.
- Depending on degree of failure to thrive and level of concern for neglect, consideration of whether a report to Child Welfare Services is needed.
- Follow-up visits weekly to every few months depending on need.

Obesity Example[19]

For a patient with a high ACE score and obesity (an ACE-Associated Health Condition) the clinical assessment would include high risk for toxic stress. In addition to tier 1 and 2 recommendations above, interventions and support services may involve:

- Creating a multidisciplinary team of support including an obesity medical specialist, dietician or nutritionist, specialist in physical activity, psychiatrist or psychologist, nurse, social worker, and the primary care provider.
- Helping the patient better engage in aerobic physical activity and resistance training by linking to professional trainers, support groups or clinic-based exercise programs.
- Addressing potential sleep issues such as obstructive sleep apnea, trouble falling asleep, sleep eating, nightmares, etc.
- Referring to a mindfulness-based intervention[20] to address binge eating or emotional eating.

- Referring to behavioral weight-loss program and/or Cognitive Behavioral Therapy of Obesity[21]
- Screening for co-morbidities such as glucose intolerance, diabetes dyslipidemia, asthma, heart disease and mental health issues including depression or anxiety[22] and addressing positive screens such as referring to mental health therapy if indicated.

Putting it All Together

You and your clinical team can start using a tiered approach to patient education and interventions and support services. Review ACE Screening, Clinical Assessment, and Treatment Planning for Toxic Stress for a case example of education, anticipatory guidance, and interventions and support services for a patient with high risk of toxic stress. ACEs Aware is working on providing additional information on how to apply a tiered approach to each of the seven toxic stress-mitigation strategies.

A helpful example of a tiered approach to relational health interventions and support services that could be used to treat toxic stress in pediatric primary care comes from an article by Dr. Garner and Dr. Young and the Committee On Psychosocial Aspects Of Child And Family Health, Section On Developmental And Behavioral Pediatrics, Council On Early Childhood. See Figure 2. on the following page.

Figure 2. An Example of an Integrated Public Health Approach for Relational Health Interventions & Support Services

Public Health Level	Types of Prevention	Approaches to Toxic Stress	Examples	Approaches to Relational Health
3	Tertiary	Indicated Treatments for toxic stress related diagnoses (e.g. anxiety depression, PTSD)	ABC PCIT CPP TF-CBT	Repair strained or compromised relationships
2	Secondary	Targeted Interventions for those at higher risk for toxic stress responses	Parent/Child ACEs SDoH BStC	Identify / Address potential barriers to SSNRs
1	Primary	Universal Preventions for all	Positive Parenting ROR Play Consistent Messaging	Promote SSNRs by building 2-Gen relational skills

Figure notes: A public health approach to prevent childhood toxic stress is a public health approach to promote national health. Many of the components of a public health approach to prevent, mitigate, and treat toxic stress responses (see examples) are also components of a public health approach to promote, identify barriers to, and repair SSNRs. The examples provided are illustrative and not intended to be comprehensive or exhaustive. BStC, biological sensitivity to context; PTSD, posttraumatic stress disorder. Adapted with permission from Garner AS, Saul RA. Thinking Developmentally: Nurturing Wellness in Childhood to Promote Lifelong Health. Itasca, IL: American Academy of Pediatrics; 2018

Source: Garner, A. and Yogman, M., 2021. Preventing Childhood Toxic Stress: Partnering With Families and Communities to Promote Relational Health. Pediatrics.

While the scientific literature does not offer a specific example of a tiered response to treating toxic stress in the adult primary care setting, there are a number of frameworks for other treatable conditions. Below is an example for pain management that could be used as a model for implementing a similar ACEs and toxic stress mitigation stepped care approach.

Figure 3. Project STEP-ing out

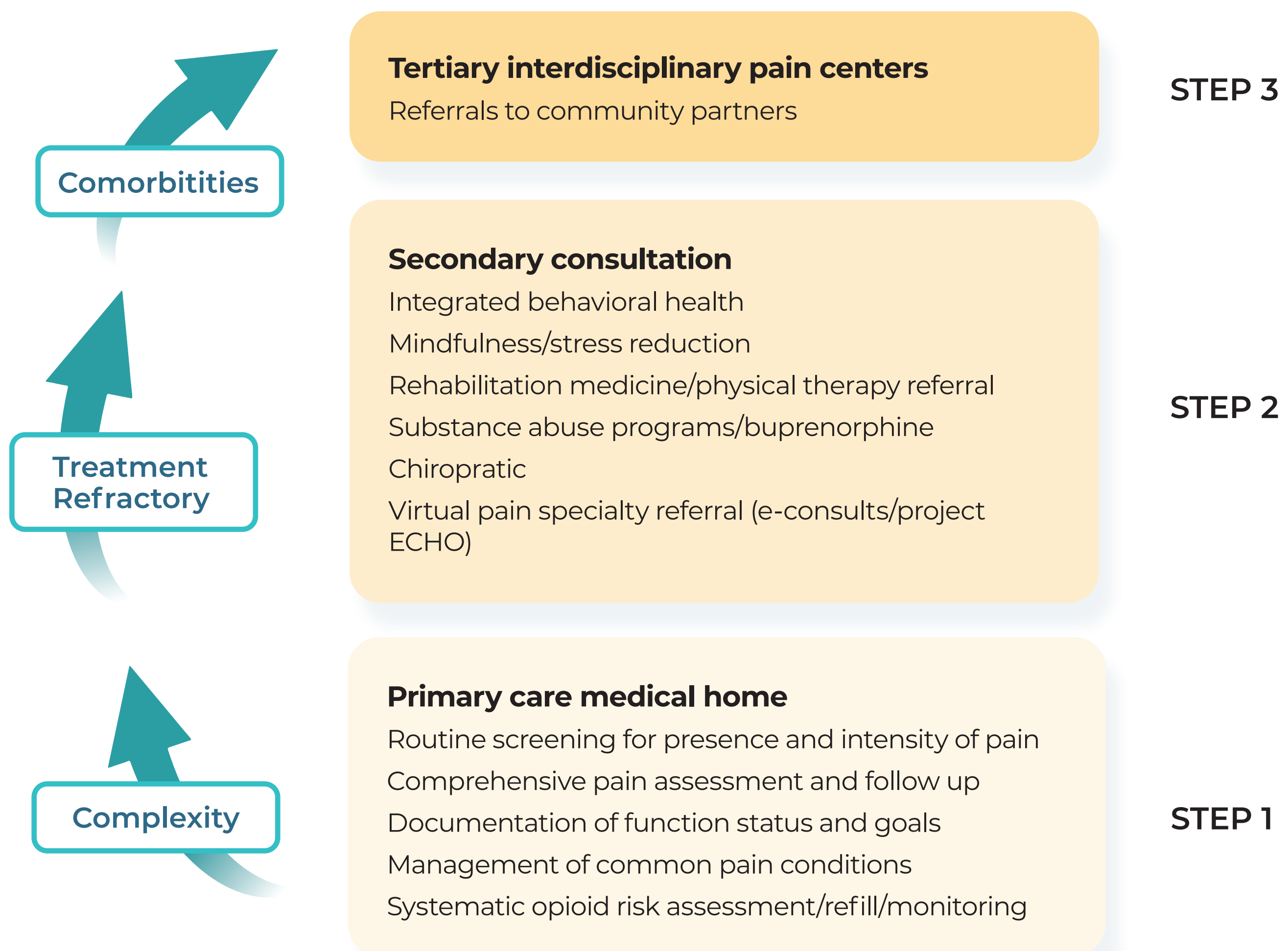

Figure notes: Modified Stepped Care Model for Pain Management at CHCI. Abbreviations: CHCI, Community Health Center, Inc.; ECHO, Extension for Community Health Outcomes.

Source: Anderson DR, Zlateva I, Coman EN, Khatri K, Tian T, Kerns RD. 2016. Improving pain care through implementation of the Stepped Care Model at a multisite community health center. J Pain Res. 2016 Nov 11;9:1021-1029.

Prepare clinicians to provide a tiered clinical response

There are several ways the implementation team can make it easier for clinicians to integrate these clinical responses into their workflow.

- **Offer training on toxic stress-mitigation strategies:** Train clinicians on the seven evidence-based toxic stress-mitigation strategies, which may include bringing in experts on specific strategies. Provide patient education tools such as the ACEs Aware Self-Care Tool for Adults and ACEs Aware Self-Care Tool for Pediatrics, scripts, and handouts (e.g., for each of the evidence-based toxic stress-mitigation strategies; see the Patient/Family Education Handouts of ACEs Aware Resources).
- **Provide scripts:** How your clinical team communicates with patients is important. Consider developing scripts and/or using acronyms to help prepare your clinical team to offer patient education and to introduce interventions and support services. See Stage 2 - Step 1 of the How-to Guide for sample scripts that you can tailor for your practice. Educate clinical teams on techniques for interacting with patients in ways that are non-judgmental, empathic, and patient centered. Consider the following techniques:
  - Motivational interviewing, including OARS: Open ended questions, Affirming, Reflective listening, and Summarizing[23]
  - REAP: Reflect, Empathize, Assess, and Plan[24]
- **Offer additional resources and tools:** It can be helpful to include clinic-based interventions that offer patients support in navigating resources or that provide support and intervention services directly. Note that the following resources are helpful, but are not required, to implement ACE screening.
  - Care coordination and case management
  - On-site social worker

- Behavioral health integration
- Support groups
- Group clinic models
- On-site behavior and development specialist

Conclusion

A "tiered" approach to the clinical response to toxic stress offers the busy clinician a way to quickly organize their treatment plan and clinical response based on the needs of the unique patient in front of them. The tiered approach – that includes primary, secondary, and tertiary prevention strategies – also provides the implementation team with a framework to help clinicians determine the level of intervention and support that is needed for patients at different levels of risk for toxic stress.

Endnotes

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