Evidence Based Practices in the Treatment of Challenging Behavior Exhibited by Individuals with Autism Spectrum Disorder

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The Autism Speaks Thought Leadership Summit on Challenging Behaviors, held in December 2020, convened leaders in autism care and research across North America. The Summit aimed to characterize the landscape of services and supports for people with autism with challenging behavior and acted as a catalyst for innovations in programs and policies to improve systems of care for this population. Six workgroups were formed, utilizing Summit participants, to develop recommendations and priorities related to both practice and public policy.

The following document covers evidence-based practices demonstrated to be efficacious for addressing challenging behavior exhibited by individuals with autism, a need identified by Summit leaders and participants, to better understand what is currently known about outcomes for autistic individuals with severe challenging behaviors, and which practices, programs, and policies have demonstrated impacts; what existing or new mechanism can help in scaling up such efforts; and what potential opportunities exist to enhance capacities in systems supporting services to aid in scaling-up or improving quality of implementation in this topical area.

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Find more resources and information at www.autismspeaks.org/clinician-guide-program-development-best-practices.
The overarching goal of this document is to provide information on evidence-based practices (EBPs) for supporting individuals with autism spectrum disorder (ASD) who engage in challenging behavior.\(^1\) The EBPs later described can be found in various publications, including Hume et al. (2021) and Steinbrenner et al. (2020). The authors recognize that the group of individuals for whom this information is relevant represents a minority of the larger community of individuals with ASD. Given that challenging behavior can vary from individual to individual and moment to moment with respect to its level of intensity, this document describes evidence-based practices in the context of different intensities. Often, challenging behavior is referred to as being of mild, moderate, or severe intensity. However, there does not appear to be consensus in the literature with respect to what defines these levels of challenging behavior and instead the definitions are left to individual interpretation (see challenging behavior severity rating tool in Fisher et al.).

A number of salient variables could impact whether challenging behavior is considered mild, moderate, or severe, which may also impact the intensity of services (see Table 1). Certainly, the extent to which the challenging behavior puts the individual or others in the environment at risk for harm affects the level of severity, as does the extent to which the behavior leads to destruction of the environment. The complexity of the assessment required to design intervention and the level of supervision required to maintain safety and implement an effective intervention also impact severity level. These variables are likely to be agreed upon among practitioners with respect to their impact in categorizing challenging behavior. Other variables that might impact the level of severity are less salient and less often considered. For

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1 Person-first language is adopted in this document as this language is typical within the disability community. The authors understand that “identity-first” (i.e., “autistic” as opposed to “person with ASD”) language is preferred by some in the autism community, but others prefer the term “autistic.”
example, the context in which the challenging behavior occurs could alter the perceived severity level (e.g., disrobing in the home vs. disrobing in a public space). Similarly, social variables such as the primary caregiver’s ability to hire in-home assistants may impact severity level. Finally, family variables and/or variables related to caregivers may impact severity level (e.g., number of people a caregiver is responsible for, caregiver physical and/or mental health, number of caregivers in a home or setting). Each of these variables may change across time for any given individual. As such, the severity of a person’s challenging behavior could vary over time, even if the topography, force, or sequelae remain constant.

The following paragraphs provide a discussion of how challenging behavior severity levels are defined within the context of this document. As suggested in the preceding paragraphs, the provided definitions are intended to be transient, depending on what variables are in play at any given time, coupled with the immediate impact of the behavior.

**Levels of Challenging Behavior**

There are many considerations when categorizing the severity of challenging behavior. These considerations include response variables (e.g., topography, frequency, intensity, impact of the challenging behavior on the environment), clinical variables (e.g., levels of assessment required, resistance to treatment), social variables (e.g., level of family or community support), and caregiver factors (e.g., work schedules, medical status).

**Response Variables: Topography, Frequency, and Intensity.** The degree to which the topography (i.e., the physical form) of the behavior results in harm to self, others, or property can help inform categorization of severity. For example, topographies such as crying and hand mouthing are likely to fall into more mild and moderate categories, whereas topographies such as choking or head-butting are more likely to fall into the severe category. However, many
Topographies of challenging behavior could fall anywhere along the continuum, depending on the frequency and intensity with which they occur.

Frequency refers to the number of times a behavior occurs (within a set time period) and can influence categorization. Behaviors that occur more frequently are likely to be considered more severe than behaviors that occur less frequently. Frequency also can change the impact of the behavior. For example, the relatively high-intensity head banging of a child that occurs once or twice a week might fall into the moderate category, whereas the relatively low-intensity head banging of a child that occurs hundreds of times a day would likely fall into the severe category.

Intensity of the behavior should also be considered when categorizing a behavior. However, this dimension can be more difficult to quantify than dimensions such as frequency and likely requires a specific line of questioning or observation to determine. For example, intensity can be measured by evaluating the impact the behavior has on the environment. More intense aggressive and self-injurious behaviors are likely to result in tissue damage and/or require medical attention. For a behavior like property destruction, milder forms will cause minimal damage or cost to replace items (e.g., tearing up paper, banging on furniture). On the other hand, more severe forms of property destruction, such as ripping a TV off a wall or destroying an iPad, will cause greater amounts of damage and result in a higher replacement cost.

To summarize the interaction of topography, frequency, and intensity and the determination of overall behavioral severity, take the example of hitting (topography), which could be categorized as mild, moderate, or severe depending on the number of times (frequency) an individual hits within a minute/hour/day, and the intensity in which they engage in the hitting
based on the impact the hitting has on the target (e.g., does it require medical attention, does it leave a mark, does it result in the destruction of valuable environmental stimuli).

**Clinical Variables: Assessment Requirements and Resistance to Treatment.** The behavioral assessment field has successfully developed meaningful assessments that identify the function (i.e., relevant evocative and maintaining variables) for challenging behavior. Often, these assessments are based on the functional analysis (FA) of challenging behavior methods first described by Iwata et al. (1982/1994), or by following a less systematic approach known as functional behavior assessment (FBA) that includes indirect assessments such as questionnaires and/or direct observation of behavior in the natural environment without manipulation of variables (descriptive assessment). Both indirect and descriptive functional assessments have the benefit of being relatively quick to administer and are based on information of the individual in the natural environment. Descriptive functional assessment has the additional benefit of focusing on prospective observational data collection instead of requiring informants to recall past events. These forms of functional assessment are limited, however, by the lack of control over extraneous environmental variables, such as attention provided by a sibling or unrestricted access to preferred items. In addition, systematic reviews have identified only a few studies on such assessments, and interventions based on these assessments were less successful than those based on FA. Although FA and descriptive functional assessments are typically conducted by professionals (e.g., board-certified behavior analysts [BCBAs], school personnel), some research suggests that with instruction from a clinician, caregivers (including parents) can be taught to conduct a functional assessment to identify the purpose of behavioral problems that can be used to plan treatment (see Germansky et al., 2020 for a review).
When challenging behavior has a clear function (i.e., the factors that maintain it can be easily identified), assessment can be straightforward, the results easy to interpret, and intervention can be simple to determine. For example, a functional analysis of self-injurious behavior (SIB) may yield results that show SIB only occurs during the attention test condition, with 0 levels of SIB observed across all other conditions. This outcome provides a clear demonstration of an attention function, and intervention can progress directly from the results. Similarly, a descriptive assessment of a mild behavior, such as screaming, may easily connect the presentation of a demand to the onset of the behavior, thereby informing an escape-related function. This ease of transition from assessment to intervention may impact the perception of the challenging behavior’s severity.

When the function is difficult to identify, effective intervention is not as apparent and may result in interventions being applied in a “trial and error” type of approach. For example, a functional analysis of SIB may yield results that show SIB occurring at variable levels across conditions, including the control condition. This type of result does not provide a clear indicator of behavioral function and may suggest (a) further assessment must be conducted, (b) the behavior occurs without regard to environmental events, and/or (c) the relevant variables were not isolated and manipulated in the context of the assessment. Regardless, such results do not lend themselves to a clear intervention pathway. This difficulty with identifying a function, and by result, difficulty identifying an intervention may impact the perception of the challenging behavior’s severity. Similarly, behavior clearly demonstrated to be maintained by social reinforcers such as escape from tasks are perceived to be less difficult to successfully treat than behavior demonstrated to be likely maintained by automatic reinforcement. Thus, assessment outcomes relative to function, even when clear, may impact the perception of severity if the
assessment suggests a more difficult function, or combination of functions, for the challenging behavior.

Resistance to treatment refers to the ease or difficulty of behavior change. Challenging behaviors that are not resistant to change require simple, antecedent management or reinforcement-based treatments. For example, adjusting the pacing of instruction delivery resulting in reduction of challenging behavior. Similarly, providing a reinforcer for complying with instruction may result in a reduction of challenging behavior. Conversely, challenging behaviors that are resistant to change require more complex or intensive intervention approaches to achieve clinically significant reductions and result in the challenging behaviors being categorized as more severe. For example, reinforcement procedures (such as reinforcing compliance) may need to be conducted in concert with a least-to-most prompting strategy, delay fading (i.e., systematically increasing the pace with which instructions are presented), and escape extinction (i.e., keeping instructional expectations in place while challenging behavior occurs). Resistance to treatment might also arise when individuals who exhibit challenging behavior encounter poor procedural fidelity that results in a lack of reinforcement for appropriate, alternative behavior and/or intermittent adherence to extinction components embedded in differential reinforcement and other intervention strategies. In other instances, resistance to treatment may be related to underlying physiological variables such as pain that are not apparent to implementers. If resistance to treatment increases, challenging behavior may move from initially being categorized as mild or moderate to being reconceptualized as severe when it is clear that, to achieve a clinically significant reduction in challenging behavior, a more intensive intervention is needed.
Caregiver Variables: Demographics, Social, and Other. Caregiver factors can also influence the severity of a challenging behavior for a variety of reasons. Factors such as caregiver physical ability, number of other children in the home/setting with a disability and/or challenging behavior, mental health factors, etc. may impact how to determine the best level of service. All of these factors can contribute to specificity of the intervention, treatment components used (e.g., extinction), length and intensity of caregiver training and therefore can influence severity of the challenging behavior. For example, a person who is the primary caretaker of a child who engages in challenging behavior as well as three other children may be less able to implement an intervention that requires constant or near constant supervision than a parent who has a single child. This wide range of variables can make categorizing challenging behavior complicated and fluid. Despite the complicated nature of categorizing challenging behavior, it is necessary to develop metrics and rules to match intensity of treatment to the severity present efficiently and effectively. In the following paragraphs, the authors describe three categories of challenging behavior (mild, moderate, and severe; see Table 2 for summary characterization with example topographies, service models, and case illustrations). These labels are not unique to this document; however, this approach to categorization represents a novel way to consider such classification. Regardless, one point the authors want to highlight is that these categories are not absolute and should be changed if additional information becomes available and provides evidence for reclassification.

Mild Challenging Behaviors are those that carry little risk of harm to the individual, others or the environment; however, these behaviors may become more severe without effective and early intervention. Mild Challenging Behaviors may be “annoying” to the person who exhibits them or others and/or may interfere with learning and adaptive functioning of the
Importantly, some mild challenging behavior may not require intervention. For example, if an individual engages in a behavior that annoys a caretaker but does not result in injury, interfere with learning or functioning, or cause the individual distress, then this response should likely not be targeted for intervention. In this instance, the behavior would not be considered challenging behavior. Often, *Mild Challenging Behaviors* may be addressed simply. From an assessment standpoint, understanding the function of the behavior is important and may be able to be determined through teaching caregivers how to conceptualize behavior as a function of its impact on the environment, or conducting a functional assessment that includes an A-B (antecedent-behavior) approach, environmental inventories, or assessment of arbitrary reinforcers that override functional reinforcers related to problem behavior. Intervention might be simple and include modifying the environment to prevent the behavior from occurring, teaching replacement behaviors such as compliance with tasks or appropriate communicative requests for specific outcomes (e.g., attention from parent), and selectively reinforcing desired behavior.

*Examples of Mild Challenging Behavior:*

- Tantrums that include crying, screaming and dropping on the floor
- Very mild head banging, or banging other body parts against objects, that is unlikely to cause any damage either due to low frequency or low intensity
- Throwing small or inexpensive items, breaking toys, ripping paper
- Hitting or kicking that is unlikely to cause any damage to the individual who is targeted
- Hand biting or hand mouthing that does not result in swelling, redness, or signs of tissue damage
- Inappropriate language (cursing, name calling, teasing, threats to fight)
- Noncompliance/Verbal defiance

_Moderate Challenging Behaviors_ result in some damage or have the potential to result in damage to the individual (e.g., SIB that causes some tissue damage, but likely does not require medical attention), moderate damage to others (e.g., aggression that has the potential to cause some tissue damage to others, elopement that occurs frequently but is unlikely to be life threatening, pica that occurs frequently but is unlikely to be life threatening) or moderate damage to the environment (e.g., moderate property destruction), or causes moderate interference with learning or functioning. Before interventions are provided, _Moderate Challenging Behavior_ will require a functional behavior assessment (FBA) because its severity is such that intervention needs to have an impact quickly and continued expression may not be as tolerable as mild challenging behavior. Non-experimental methods may be sufficient to produce effective intervention, particularly interventions that incorporate teaching and reinforcing replacement behaviors. In some cases, a functional analysis may be required. If so, the analysis may be able to be completed quickly using only one to two experimental conditions and a control condition. Identification of an appropriate intervention requires multiple assessment and treatment sessions prior to generalizing to the natural environment. Thus, intervention is highly individualized, but its implementation requires no more than one therapist to safely manage challenging behavior should it occur. An individual may fall into this category if less intensive treatments have failed, and/or caregiver factors are present that would require a more intensive caregiver training model to achieve clinically significant results.
Examples of Moderate challenging behavior:

- Head banging that leaves a red mark but that does not cause bruising and does not require protective equipment to maintain safety and does not occur at a frequency likely to cause cumulative damage.
- Hand-to-Head SIB that occurs frequently but that is unlikely to cause any permanent damage.
- Aggressive behavior such as biting and hitting that does not cause significant tissue damage but is painful and/or may leave some redness or minor bruising.
- Elopement in a grocery store or other environment that does not put the individual in immediate harm.
- Pica that includes ingesting paper, or other items that are unlikely to cause harm when consumed.

Severe Challenging Behavior results in, or has the potential to result in, significant damage to the individual exhibiting the behavior (e.g., SIB that causes immediate significant tissue damage requiring medical attention or would cause significant damage if allowed to occur), significant damage to others (e.g., aggression that causes significant tissue damage to others or could cause significant damage if allowed to occur, elopement that can lead to bodily harm or could lead to significant harm if allowed to occur, pica that is life threatening or could be life threatening if allowed to occur), or significant damage to the environment (e.g., severe property destruction), or significantly interferes with learning or functioning. From an assessment standpoint, Severe Challenging Behavior requires (a) a functional analysis to identify or rule out environmental variables that are controlling and maintaining these behaviors, (b) a systematic assessment that can identify reinforcers that override the functional reinforcers so that effective concurrent
reinforcement schedules can be arranged, and/or (c) close monitoring of reinforcement-based (and other, for example protective equipment) interventions to determine adjustments when function cannot be identified via a functional analysis due to setting or other practical constraints. Identification of an appropriate intervention may require daily intensive services (e.g., 5 days a week for 5 hours a day) prior to generalizing to the natural environment. In addition, Severe Challenging Behavior typically requires more than one therapist to safely manage and implement intervention. An individual may fall into this category if less intensive treatment has failed, and/or caregiver factors are present that would require a more intensive caregiver training model to achieve clinically significant results.

Examples of Severe Challenging Behavior:

- Head-directed SIB (e.g., headbanging, hand to head SIB, knee to head SIB) results in severe tissue damage, broken bones
- Hitting or kicking others that causes significant tissue damage, bleeding, broken bones, concussion
- Aggression or SIB that does not cause damage in a single instance but that over time can cause significant injury. For example, ear hitting that causes mild redness when it occurs and, over time, results in deformation of the ears.
- Any challenging behavior that increases significantly in intensity when not reinforced.
- Elopement towards busy streets, bodies of water or other acutely unsafe contexts.
- Ingesting safety pins, screws, cleaning liquids or other unsafe objects.
- Pica that occurs at a high rate and the individual will consume anything that is found.
In each of these categories, variables unrelated to the behavior might push it from one category to the next. For example, a child who engages in problem behavior that does not produce injury or threat of injury and occurs relatively infrequently might be considered mild if the caregiver is able to attend a parent training program and implement its components with high fidelity. However, in the same scenario, a caregiver without access to training or who is unable to implement components with fidelity might result in the behavior requiring additional resources to manage successfully and be considered moderate challenging behavior. Conversely, a behavior that meets the topographical and environmental descriptors of moderately challenging behavior but occurs in a context with a caregiver who is well versed in intervention strategies, and/or who has access to in-home supports also able to implement intervention strategies with high fidelity, might result in challenging behavior being considered mild in nature.
<table>
<thead>
<tr>
<th>Factors that May Influence Referral to Higher Intensity Services</th>
<th>Behavior</th>
<th>Intervention</th>
<th>Individual</th>
<th>Caregiver/Family</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Automatic function</td>
<td>-Complex assessment/treatment planning needs</td>
<td>-Significant cognitive/ language impairments</td>
<td>-Caregiver mental health concerns</td>
<td>-Caregiver physical health/mobility concerns</td>
<td>-Community availability of higher intensity service levels</td>
</tr>
<tr>
<td>- Negative social impact (e.g. stigmatizing behaviors)</td>
<td>-Multiple providers needed to implement the treatment plan</td>
<td>-Behavioral/emotional comorbidities</td>
<td>-Caregiver cognitive deficits</td>
<td>-Caregiver advanced age</td>
<td>-Housing factors (e.g. shared walls; behavior increases risk of eviction)</td>
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<td>- Legal risk (e.g. sexual behaviors)</td>
<td>-Older age</td>
<td>-Incongruence between caregivers on behavior plan implementation</td>
<td>-Other siblings with special needs</td>
<td>-Prior caregiver history of low implementation fidelity</td>
<td>-Behavior(s) occur across settings (home, school, community)</td>
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<tr>
<td>- Life threatening</td>
<td>-Physical size</td>
<td>-Medical comorbidities</td>
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<tr>
<td>- High risk of harm to others or destruction of environment</td>
<td>-Treatment resistance with lower-tier service</td>
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<tr>
<td>Factors that May Influence Referral to Lower Intensity Services</td>
<td>-Social function</td>
<td>-Function of behavior can be easily/clearly identified through descriptive/indirect assessment methods</td>
<td>-Average cognitive/language skills</td>
<td>-Multiple caregiver engagement with agreement in treatment plan</td>
<td>-Lack of access community to more intensive services</td>
</tr>
<tr>
<td>- Function of behavior is singular</td>
<td>-Low complexity (e.g. manualized) intervention</td>
<td></td>
<td>-Prior exposure/training in behavior analytic procedures</td>
<td>-Ability to implement procedures with high fidelity</td>
<td>-Social support from community (e.g. social networks, extended family)</td>
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<tr>
<td>- Lack of access community to more intensive services</td>
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<td></td>
<td>-Financial resources that allow for engagement in multiple treatment services</td>
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<tr>
<td>- Social function</td>
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</table>

**Table 1. Factors that Influence Referral Pathways for Service Intensity**
| Mild | Carries little risk of harm and/or result in little to no damage to the individual, others, or environment. | -Crying -Screaming -Tantrums -Tearing paper -Throwing small items -Cursing -Teasing -Noncompliance | -Psychoeducation -Descriptive/indirect assessment to hypothesize function of behavior -Weekly outpatient behavioral support with individual therapist | -4-year-old hitting caregiver with a closed fist one time per day resulting in temporary red spot on caregiver’s leg -12-year-old hitting younger sibling with open hand 1-2 times per week, leaving no mark |
| Moderate | Results in some physical harm/tissue damage to the individual or others, moderate damage to the environment, and/or some risk of safety, but does not require consistent medical attention or is not life-threatening. | -Head banging that leaves a red mark but no bruising -Biting that does not break the skin -Elopement within confined environments (e.g. school building) -Pica (e.g. paper) | -Descriptive/indirect assessment or brief functional analysis to hypothesize function of behavior -One to three outpatient visits per week with individual therapist; Intensive outpatient (5 days/week for a discrete amount of time, e.g. 2 weeks) with a treatment team | 3-year-old hitting her temple 20-30 times per day, resulting in a permanent red mark/abrasion on her temple - 9-year-old hitting caregiver a 4-6 times per week, resulting in bruising on caregiver’s arm and torso |
| Severe | May result in significant damage or bodily harm to the individual or others (requiring medical attention), high risk of safety, or significant damage to the environment. | -Choking -Head-butting -Pica (e.g. sharp objects) -Elopement toward danger (e.g. water, roads) | -Experimental functional analysis to hypothesize function of behavior -Daily inpatient or intensive outpatient services 5 hours/day, 5 days/week with treatment team | 17-year old hitting caregiver 15 times per day. Caregiver’s arm is broken when attempting to block hit, requiring trip to the emergency room |
Evidence Based Practices

Recent reviews of the literature (descriptive and comprehensive) have identified numerous interventions as evidence-based (i.e., evidence-based practices [EBP]) for addressing core and associated features of autism spectrum disorder (ASD). A few descriptive reviews have covered all intervention literature for specific age ranges (e.g., Wong et al., 2015) or across the lifespan (e.g., NAC); however, most reviews center attention on a specific intervention type or focus (e.g., McKeithan & Sabornie 2020; Nevill et al., 2018; Sandbank et al., 2020) or setting (e.g., Whalon et al., 2015). Across settings and ages, 27 EBPs have been identified that address core and associated features of ASD (see Steinbrenner et al., 2020). A subset of those EBPs is designed and/or has been evaluated for their efficacy in addressing challenging behavior, which is the focus of this document.

In the following sections, interventions that have been shown to be effective for addressing challenging behavior are described along with considerations related to variables that impact perceived severity, including function of behavior, intensity of behavior, and support variables. Challenging behavior has been demonstrated to occur as a function of environmental variables, including evocative events and reinforcing consequences (i.e., these behaviors are operant in nature). As discussed previously in this document, these variables can be identified through the process of a functional behavior assessment. That assessment can be simple (e.g., interview with care providers regarding the events that occasion and support the behavior) or more complex (e.g., systematic manipulation of antecedent and/or consequence variables to empirically identify the relation between these events and challenging behavior). In brief, the outcomes of such assessments might broadly identify two types of behavior: 1) behavior evoked and maintained by social variables, and 2) behavior evoked and maintained by nonsocial variables (also known as automatically maintained behavior). When challenging behavior is maintained by social variables (e.g., attention provided by caregivers, escape from aversive instructions or situations, and/or access to preferred stimuli), interventions involve modifying the environment, teaching skills, or
some combination of those approaches. When challenging behavior is maintained by internally produced reinforcers (i.e., automatic reinforcement), intervening is often more difficult because the variables evoking and maintaining challenging behavior are often outside of the control of implementers. In these situations, the focus is often on modifying the environment.

Intensity of the behavior must also be considered when selecting and implementing EBPs. Some practices include components that may result in temporary increases in frequency or severity of behavior. If the pre-intervention level of challenging behavior produces immediate injury, then these practices might not be prudent. For example, functional communication training (FCT) is a widely used intervention to reduce challenging behavior maintained by socially available reinforcers like attention. Research has consistently demonstrated that this treatment approach works best when an extinction (i.e., disruption of the relation between challenging behavior and its maintaining consequence; Hagopian et al., 1996) component is included. However, other research has shown that inclusion of an extinction component can result in temporary increases in the intensity or frequency of the previously reinforced behavior and/or emotional arousal (i.e., extinction burst; Lerman et al., 1999). Thus, FCT might not be a viable option if temporary increases in severity or frequency of the challenging behavior or emotional arousal cannot be tolerated or safely managed.

Caregiver-related variables might also impact intervention selection. Some EBPs require simple manipulations of the environment. For example, antecedent-based strategies might require simply changing the type of instructions that are provided (e.g., instructional level instead of frustration level) to reduce challenging behavior maintained by escape from academic tasks. This approach requires minimal training and skill on the caregiver/implementer’s part and can be put in place without requiring additional support. On the other hand, differential reinforcement of other behavior to address the same type of behavior would require the caregiver/implementer to monitor the occurrence of challenging behavior, manipulate a timer that signals when or if the omission requirement had been met, and potentially protecting themselves or the individual should
problem behavior occur in the presence of instruction delivery. Tables 1 and 2 provide an overview of variables that may influence referral pathways related to service intensity.

**Evidence-Based Interventions for Challenging Behavior**

Various sources (Steinbrenner et al., 2020; Wong et al., 2015) have identified approximately 27 interventions that have been shown to be effective for addressing core and associated features of autism. Evidence for their utility exists in the scientific literature related to behavioral interventions utilized to address behavioral excesses and deficits experienced by individuals with ASD. Practitioners are directed to these citations for more specifics regarding information on these practices, and the methods to determine their status as evidence based. It is important to note that much of the research documenting efficacy of various interventions was conducted in controlled research settings with highly trained implementers. As a result, the extent to which these interventions will yield similar results in less controlled settings and/or with implementers who are not highly trained is less well established. This limitation does not mean that these interventions are not evidence based but rather that their efficacy may depend on both the context they are implemented in and the skills of the implementers.

Because not all of the identified EBPs have been shown to be effective to address challenging behavior, seven practitioners with expertise in assessment and treatment of challenging behavior reviewed the list of interventions and accompanying research citations supporting those interventions. The authors identified 13 interventions (from the list of 27) with research supporting their efficacy for addressing challenging behavior. Some of the 13 EBPs are a single strategy that is rarely used in isolation whereas (e.g., extinction); others are broad treatment packages (e.g., parent implemented instruction and intervention) that include subcomponents included in this list of 13 interventions. In addition, these approaches affect behavior through various mechanisms, including changes in motivating operations (i.e., antecedents), extinction,
reinforcement/skill building (i.e., teaching or strengthening alternative behavior), and punishment. Table 1 lists and categorizes the EBPs identified as relevant to challenging behavior.

It is also worth noting that this document is limited to describing EBPs related to challenging behavior. Individuals with ASD may receive several different types of interventions related to various behavioral excesses, deficits, and skill development. For example, a person may participate in cognitive behavioral intervention to address anxiety and, as part of the intervention, learn strategies that lessen the likelihood of meltdowns and challenging behavior. Other people may take part in additional therapies such as music therapy or occupational therapy that are intended to include strategies to reduce challenging behavior (e.g., addressing sensory issues that lead to challenging behavior). The authors have focused this document on interventions that have evidence specifically related to addressing challenging behavior and recognize that this may preclude inclusion of other approaches (e.g., cognitive behavior therapy, occupational therapy) that may also be helpful. In other words, the fact that a specific intervention or approach does not yet have evidence supporting its effectiveness does not mean that it is not effective. That said, there are several approaches that have been shown to be harmful (e.g., rapid prompting method, chelation therapy). Thus, it is encouraged that anyone considering approaches other than those on this list and in this document to ensure the approach has not been found to be harmful or dangerous (https://www.asha.org/policy/; https://www.abainternational.org/about-us/policies-and-positions.aspx; https://www.aacap.org/App_Themes/AACAP/Docs/practice_parameters/autism.pdf). Professional organizations such as the American Speech and Hearing Association and Association for Behavior Analysis International often publish position statements and guidance related to ineffective and/or dangerous interventions.
Table 1. Identified EBPs relevant to interventions for challenging behavior.

<table>
<thead>
<tr>
<th>Evidence Based Practice</th>
<th>Type (Package, Stand Alone, Component)</th>
<th>Mechanism(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedent Based Interventions</td>
<td>Stand Alone, Package</td>
<td>Antecedent/EO manipulation</td>
</tr>
<tr>
<td>DRA/I/O</td>
<td>Stand Alone, Package</td>
<td>Reinforcement and Extinction</td>
</tr>
<tr>
<td>Exercise</td>
<td>Stand Alone, Package</td>
<td>Antecedent/EO manipulation</td>
</tr>
<tr>
<td>Extinction</td>
<td>Component</td>
<td>Extinction</td>
</tr>
<tr>
<td>FCT</td>
<td>Stand Alone, Package</td>
<td>Reinforcement and Extinction</td>
</tr>
<tr>
<td>Parent-Implemented Instruction &amp; Intervention</td>
<td>Package</td>
<td>Combination of Mechanisms</td>
</tr>
<tr>
<td>PECS</td>
<td>Component</td>
<td>Reinforcement</td>
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<tr>
<td>Prompting</td>
<td>Component</td>
<td>Antecedent</td>
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<td>Reinforcement</td>
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<td>Response Interruption/Redirection</td>
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<td>Time Delay</td>
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<td>Visual Supports</td>
<td>Package, Stand Alone, Component</td>
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In the following paragraphs, these EBPs are described, as are variables that should be considered prior to implementation. Some EBPs overlap. For example, “Exercise” is a type of “Antecedent Based Intervention.” In such instances, the EBPs will be described together. The purpose of the following portion of this document is to describe the use of these EBPs in the context of intervention for challenging behavior exhibited by individuals with autism. Each EBP will be briefly described, and the considerations for its use based on the current level of challenging behavior will be addressed.

Antecedent Based Interventions.

Description. Antecedent Interventions are strategies that manipulate the environment prior to the occurrence of the target behavior and include treatments such as noncontingent reinforcement (NCR), manipulation of motivating events, antecedent exercise, environmental enrichment, high-probability sequences/behavioral momentum, stimulus control strategies and demand/stimulus fading.

Examples from the literature.


**Intervention type.** Antecedent Interventions include a wide range of interventions that can either be used as a standalone treatment or be included as a component in a larger treatment package. For example, a clinician may choose to use NCR as a standalone intervention to treat attention-maintained challenge behavior by providing noncontingent access to attention or attention on a fixed time schedule with no other contingencies provided for either appropriate or challenge behavior. On the other hand, a clinician may choose to use demand fading as part of a larger treatment package with demand fading functioning as an antecedent intervention (i.e., abolishing operation) to engage in challenging behavior while also providing differential reinforcement for compliance.

**Behavioral mechanism(s).** There are two likely mechanisms related to the effect of antecedent-based interventions: motivating operations and stimulus control. Most antecedent interventions manipulate motivating operations (MO). Motivating operations impact the value of a reinforcer by either increasing (establishing) or decreasing (abolishing) that value. When used to decrease challenging behaviors, an antecedent-based intervention is likely functioning as an abolishing operation. Thus, the value of the reinforcer is diminished leading to the individual being less motivated to engage in the challenging behavior to obtain the reinforcer. However, in some cases the antecedent interventions may also function as an establishing operation for engaging in an appropriate replacement behavior. Another mechanism related to antecedent interventions is alternating discriminative control. Discriminative control procedures work by paring specific stimuli with specific consequences leading the stimuli to exhibit discriminative control when presented. The pairing process that is required for the stimuli to exhibit discriminative control does require use of consequence base procedures, however once the stimuli have discriminative control the presentation of the stimulus as either a sole component or part of a larger treatment package is considered an antecedent intervention.

**Severity and behavioral function considerations.** Antecedent interventions can fall into two different categories: 1. Default interventions that do not rely on identification of specific variables maintaining the challenging behavior (e.g., environmental enrichment), and 2. Function based,
which relies on identification and manipulation of the functional reinforcer (e.g., NCR). Therefore, they can be used for all behavioral functions and can be a good choice when function cannot be identified. Antecedent interventions can all be used for all levels of severity and can be good options for very severe forms of challenging behavior especially when extinction is not safe or feasible.

**Caregiver, context, and practical considerations.** Antecedent interventions are often very easy to implement, can be implemented in a variety of settings by a wide variety of caregivers making them a great choice in many different situations. Because they do not rely on consequences they can be used when other consequence-based interventions are not possible such as extinction. They also work well when combined with other behavioral components such as differential reinforcement. The Antecedent interventions are often used to decrease motivation to engage in challenging behavior which can then in turn increase the likelihood that individual contacts differential reinforcement (DRA, DRO, etc.).

**Differential Reinforcement of Alternative, Incompatible, or Other Behavior (DRA/I/O).**

*Description.* DRA/I/O include (a) providing reinforcement for a particular alternative behavior (DRA) that may also be incompatible (DRI) with the expression of the challenging behavior or providing reinforcement following predetermined time intervals during which challenging behavior does not occur (DRO), and (b) withholding reinforcement for the occurrence of challenging behavior (i.e., extinction). In recent years, some researchers have altered this second component (extinction) to include a reinforcement schedule that produces fewer reinforcers or reinforcers that are lower in magnitude than the reinforcement schedule for alternative behavior (e.g., Athens & Vollmer, 2010).

*Examples from the literature.*


**Intervention type.** DRA/I/O is often implemented as a stand-alone intervention but can also be implemented as part of a wider treatment package. This approach to intervention includes two components. In their initial implementations, DR-based interventions included one component that scheduled reinforcer delivery following alternative/incompatible behavior or omission of challenging behavior and a second component that specified extinction for challenging behavior. As mentioned, implementation of DR procedures has been more recently described to still include two components, with the second component being scheduled delivery of a reduced amount or quality of reinforcer following challenging behavior, relative to the reinforcer scheduled for alternative/incompatible behavior or omission of challenging behavior.

**Behavioral mechanism(s).** DR’s effects can be attributed to reinforcement and extinction when implemented as a two-component intervention that includes extinction. When implemented as a two-component intervention that includes different schedules of reinforcement, its effects can be attributed to reinforcement with higher rate, magnitude, or quality of reinforcement shifting allocation toward alternative/incompatible behavior or omission of challenging behavior.

**Severity and behavioral function considerations.** DRA/I/O can be implemented with the extinction component when challenging behavior poses minimal risk to the individual or implementer. Care may need to be taken when implementing DRA/O/I with the extinction component when challenging behavior is moderate or severe. Extinction-based interventions can result in temporary increases in frequency and/or intensity of challenging behaviors. Implementation requires observation and monitoring of at least two behaviors, and its implementation requires high procedural fidelity to maximize efficacy. DRA/O/I have been demonstrated to be effective for challenging behavior with social functions. Some limited demonstrations of effectiveness exist for DRA/O/I related to behavior with a non-social (i.e., automatic) function. However, in these implementations it should be noted that the extinction component is not possible, given that the challenging behavior directly produces access to
the maintaining reinforcer. Thus, when arranged for treatment of automatically maintained challenging behavior, DRA/O/I establish two competing reinforcement schedules in an attempt to shift responding away from challenging behavior.

Caregiver, context, and practical considerations. Caregivers /implementers with wide ranging responsibilities (e.g., teachers in classrooms with large numbers of students; caregivers with multiple children or overlapping household responsibilities) might struggle with implementation, regardless of challenging behavior intensity. Initially, a dense schedule of reinforcement (i.e., reinforcers are delivered frequently and/or after each occurrence of the target response) will likely be required to change behavior. This initially dense reinforcement schedule can result in disruption to ongoing activities, such as academic learning. However, successful strategies to thin the schedule of reinforcement delivery have been described in the literature, including delays to reinforcement, increasing the response requirement, and specifying time intervals during which reinforcement is available using schedule correlated stimuli (i.e., a multiple schedule).

Exercise

Description. While the literature is sparse, there is some evidence to support that exercise in various forms may reduce problem behaviors such as stereotypies, off-task behavior, mouthing, elopement, self-injury, disruptiveness, and aggression in autistic individuals. Benefits appear to be short-term, impacting behavior during as well as up to several hours after exercise. Some studies indicate that there are no differential impacts on challenging behavior between low or high intensity exercise.

Examples from the literature.


**Intervention type.** A variety of exercise activities have been studied, including walking, jogging, weight training, fitness routines, and bike riding at varying intensities.

**Behavioral mechanism(s).** Exercise may be used as an antecedent management strategy to reduce the likelihood of challenging behaviors.

**Severity and behavioral function considerations.** For stereotypic behaviors (automatic function), explanations for the benefit of exercise with some data support include: 1) the “neurotransmitter hypothesis,” which suggests that physical exercise targets dysfunction within the serotonergic, dopaminergic, and GABA neurotransmitter systems observed in stereotypic behaviors, by producing changes in the synthesis and metabolism of monoamines, as well as the enhancement of norepinephrine, dopamine, serotonin, and GABA production; 2) the “fatigue hypothesis,” which suggests engagement in stereotypic behaviors decrease because the body is too fatigued following exercise.

**Caregiver, context, and practical considerations.** In promoting exercise in autistic individuals, caregivers should consider the individual’s activity preferences, e.g., riding a bike, jumping on a trampoline, swimming. Utilizing preferred activities will increase motivation to engage in the targeted exercise routine. Additionally, while many individuals engage in exercise for intrinsic benefits (e.g., weight loss, health), caregivers may need to provide other forms of reinforcement to motivate engagement in exercise for autistic individuals (e.g., completing an exercise routine earns access to a preferred tangible reinforcer). There is some literature to suggest that while group interventions are most cost-efficient, individual interventions are more effective than group interventions.

**Extinction**
**Description.** Extinction is used when a behavior is maintained by reinforcement. When extinction is used, the relationship between the behavior and the consequence that reinforces it is removed. For example, if a person’s hitting others is occurring frequently because it results in frequent delivery of attention, aggression is maintained by attention. In this case, extinction would involve ensuring that attention no longer followed incidences of aggression.

**Examples form the literature.** See DRO/I, Prompting, and Reinforcement

**Intervention type.** Extinction is rarely if ever implemented as a stand-alone intervention because best practice in intervention for problem behavior is to identify and reinforce an alternative, more desirable behavior as a component of interventions to reduce problem behavior.

**Behavioral mechanism(s).** Effects of extinction are due to disruption of the link (association) between a response and the consequence that follows it. In other words, extinction works when the result is that the behavior no longer “pays off” for the person.

**Severity and behavioral function considerations.** When challenging behavior poses minimal risk to the individual or the implementer, extinction generally can be implemented without taking additional steps to ensure safety. As risk increases, care needs to be taken to ensure safety should extinction result in increases in the frequency of the target behavior and/or occurrence of other undesired behaviors. If safety cannot be maintained, then extinction should not be used. When the function of the behavior is attention, it may be difficult for some individuals to withhold attention when the behavior occurs, in which case extinction is not recommended. If the function of the behavior is gaining access to certain activities or items, then extinction should not be considered unless it is feasible to withhold those items. For responses maintained by escape or avoidance, interventions should include antecedent strategies to reduce the aversiveness of the context or situation. Examples include adjusting the difficulty of a task or the amount of time a task occurs for. If a response is maintained by access to items or activities, then extinction is feasible only if access can reasonably be restricted should the problem behavior occur. In all cases, it is important that the person has one or more
alternative ways of obtaining access to desired items or activities (e.g., FCT), and that those behaviors are reinforced (pay off). When a response seems to be maintained by sensory or automatic reinforcement, extinction is more difficult and often not feasible. Sometimes devices or equipment can be used to reduce effects of the behavior, and if this results in reduction in responding, this could be extinction. For example, someone who bites their fingertips might wear gloves to reduce the sensation of biting. In general, extinction is not effective for such behavior. Another important consideration is negative emotional arousal. Because extinction involves ensuring that a response is no longer reinforced, undergoing extinction can be difficult for a person for whom it is being implemented. A person experiencing extinction may experience significant emotional distress. Therefore, it is important that anyone considering the use of extinction understand that such distress is likely to occur and be certain that all stakeholders agree that using extinction to reduce challenging behavior is necessary and is able to justify its use in the face of significant distress.

**Caregiver, context, and practical considerations.** Extinction is difficult to implement because it involves ensuring withholding something that a person desires. This can make extinction difficult for caregivers to implement, especially if, as discussed previously, extinction produces negative emotional arousal (e.g., crying) or more or different challenging behaviors. Another consideration is that extinction is likely to be ineffective if it is not implemented consistently. Therefore, if a caregiver is not certain that they will always be able to withhold consequences when problem behavior occurs, then extinction might not be a good choice for intervention. There are many other intervention strategies that likely are more appropriate than extinction and therefore extinction should be used only after careful consideration of the potential negative ramifications and alternative strategies.

**Functional Communication Training (FCT)**
**Description.** One generally effective strategy to reducing challenging behavior is through the establishment of appropriate, communicative behavior exhibited by the individual. The effectiveness of this general strategy is most notably demonstrated through the implementation of functional communication training (FCT), and specifically in the development of communication using the picture exchange communication system (PECS; described later in this document). Functional communication training includes identifying the reinforcer(s) maintaining problem behavior through a functional behavior assessment process and then delivering the identified reinforcer(s) following appropriate communicative responses (e.g., vocal requests or use of augmentative and alternative communication strategies; Carr & Durand, 1985).

**Examples from the literature.**


**Intervention type.** FCT is often implemented as a stand-alone intervention but can be implemented as part of a wider treatment package. It has been described in the literature as a single component (reinforcement for appropriate communication) intervention, a two-component (reinforcement for appropriate communication and extinction for problem behavior, in line with what is known as differential reinforcement of alternative [DRA] behavior) intervention, or a multiple-component (reinforcement for appropriate communication, extinction and negative punishment following problem behavior) intervention.
**Behavioral mechanism(s).** FCT’s effects can be attributed to reinforcement/skill building (regardless of the number of components), or reinforcement/skill building, extinction, and/or punishment, depending on which components are incorporated.

**Severity and behavioral function considerations.** When challenging behavior poses minimal risk to the individual or the implementer, the full range of component combinations can be implemented. As risk increases, care needs to be taken with including the extinction component to ensure safety should extinction-related increases in response frequency or intensity occur. FCT in its most effective form (i.e., reinforcement of communicative behavior along with extinction) requires the implementer monitor at least two responses (communicative behavior and challenging behavior) and implement the procedure with high fidelity. FCT has been demonstrated to be effective as an intervention to reduce challenging behavior maintained by social reinforcers (e.g., attention, access to tangibles, escape from tasks, or some combination). On the other hand, because the implementer cannot deliver internally produced (i.e., automatic) reinforcers upon individual request, FCT has not been used as an intervention for challenging behavior maintained by automatic reinforcers.

**Caregiver, context, and practical considerations.** Like considerations described regarding differential reinforcement, caregivers /implementers with wide ranging responsibilities (e.g., teachers in classrooms with large numbers of students; caregivers with multiple children or overlapping household responsibilities) might struggle with implementation, regardless of if they are addressing mild or severe challenging behavior. Initially, as with most reinforcement-based interventions, a dense schedule of reinforcement (i.e., reinforcers are delivered frequently and/or after each occurrence of the target response) is required. This initially dense reinforcement schedule can result in disruption to ongoing activities. However, successful strategies to thin the schedule of reinforcement delivery have been described in the literature, including delays to reinforcement, increasing the response requirement, and specifying time intervals during which reinforcement is available using schedule correlated stimuli (i.e., a multiple schedule). Additionally, because FCT has been demonstrated to be optimally effective when an extinction component related to
challenging behavior is in place, implementation can sometimes lead to extinction-related side effects which tend to be more concerning with higher intensity challenging behavior.

**Parent-Implemented Instruction & Intervention**

*Description.* The recognized struggles parents face in raising youth with ASD have led to increased interest in the development of evidence-based, parent-focused interventions for ASD. In parent training (PT), caregivers are taught to implement specific procedures designed to improve parent-child interactions, decrease behavioral problems, and increase prosocial behaviors. Parent Training (PT) is a fitting treatment model for several reasons: (1) it is traditionally a time-limited approach (typically 10–20 sessions) delivered during brief (1–1.5 h) weekly sessions; (2) it has demonstrated efficacy in treating disruptive behavior in neurotypical children; (3) it empowers caregivers by emphasizing their role as the change agent; (4) it is more effective compared to interventions delivered by a therapist alone; (5) it is deliverable in a wide range of service settings. Finally, there is increased recognition that intensive interventions are costly and specialized, intensive services may not be available in all communities. Teaching caregivers to be the therapist for their child allows for delivery of treatment across settings and contexts.

*Examples from the literature.*

**Single-subject research:** Caregiver-implemented techniques based on principles of applied behavior analysis historically demonstrated empirical support through single-subject design studies, offering proof of concept for specific parent-mediated techniques for autistic youth with co-occurring challenging behavior.

Prospective case series and quasi-experimental trials: More recently, several open prospective case series and quasi-experimental trials using structured manuals have been published, supporting the efficacy of behavioral PT in reducing behavioral problems in children with ASD.


Parent training + medication: PT has also been shown to be an effective adjunct treatment to medication in youth with ASD: atomoxetine in the treatment of attention deficit hyperactivity and noncompliance and risperidone in the treatment of serious behavioral problems.


**Meta-analysis of parent training for disruptive behavior:** Most recently, a meta-analysis of eight randomized controlled trials has shown that PT is an effective intervention for reducing disruptive behavior in children with ASD (age 2–14 years). The quality and duration of PT varied, and effect sizes ranged from small to large. The overall effect size was 0.58.


**Intervention type.** With guidance from a therapist, caregivers are taught to address disruptive behavior by attending to the child's prosocial behaviors, ignoring inappropriate behaviors, decreasing the use of punitive and coercive discipline strategies, and increasing the use of effective, appropriate, non-coercive child management strategies. These essential components are the centerpiece of PT for reducing behavioral problems. Common PT elements that follow behavior analytic principles include role playing, guided implementation with the child in session to support parental skill acquisition, homework so that parents can practice applying strategies in real life and follow up sessions to review and refine the behavioral techniques.

**Behavioral mechanism(s).** Following education on the Antecedent-Behavior-Consequence model and functions of behavior, therapists may review with caregivers the following approaches: antecedent management strategies, consequence-based approaches, skill acquisition, and generalization and maintenance to promote stable change in the child and to enhance the caregivers’ abilities to apply skills learned in future situations and settings.

**Severity and behavioral function considerations.** PT is an approach that is well-suited for autistic youth who display mild to moderate behavioral problems and is delivered to caregivers who can apply in-session didactic and interactive teaching materials into home and community settings. PT may be more challenging for individuals who have severe behavioral problems (e.g., high frequency and intensity self-injurious behaviors) or in
situations where the caregiver may report difficulties applying strategies consistently in the home or community. For example, a caregiver attempting an extinction procedure with an older individual who may be physically bigger and/or stronger than his parent may be better suited for trials conducted in well-controlled settings, with a high level of support provided by the therapist.

*Caregiver, context, and practical considerations.* As noted above, certain procedures, such as extinction, may be difficult for caregivers to implement, especially if extinction produces a significant escalation in challenging behaviors.

**Picture Exchange Communication System (PECS)**

*Description.* The picture exchange communication system (PECS) is a pictorial system that teaches autistic individuals with social-communication deficits functional communication using pictures (black-and-white or color drawings) as the communicative referent. The pictures are kept by the individual on a notebook (PECS board) with velcro. The individual is taught to use their PECS board and create a “sentence” by selecting picture cards (e.g., “I want” card plus “juice” card) and delivering the cards to a communicative partner as a request for a desired item. PECS emphasizes teaching an individual to initiate requests (for seen and unseen items), respond to questions (e.g., “What do you want?”), and make social comments (e.g., “I see [object]”).

*Examples from the literature.*


**Intervention type.** Picture Exchange Communication System (PECS) is an augmentative and alternative communication system (AAC) that is used to supplement or replace natural speech for individuals without functional speech. Unlike other AAC systems, PECS is unique in that it does not require prerequisite skills, such as pointing, labeling, or matching, but rather teaches individuals to request preferred items, which is a functional skill maintained by consequent access to preferred reinforcers. The PECS training protocol involves six Phases: Phase I teaches individuals to initiate requests using a picture card exchange. Phase II instructs children how to request desired items by traveling to a communication book and to the communication partner. Phase III is intended to instruct picture discrimination between two or more pictures from a communication book. Phase IV teaches the child to develop a sentence by combining pictures (e.g., “I want” + “desired item”). In Phase V, children are taught how to respond to questions (e.g., “What do you want?”). During Phase VI, additional sentence starters using pictures are introduced to the student (e.g., “I see,” “I hear,” and “I smell”).

**Behavioral mechanism(s).** PECS uses basic behavioral principles and techniques such as shaping, differential reinforcement, and transfer of stimulus control via delay to teach functional communication using pictures (black-and-white or color drawings) as the communicative referent.

**Severity and behavioral function considerations.** As a primary tool to request, PECS is appropriate as a functional communication tool to replace challenging behaviors designed to request access to preferred items (tangible) or escape/avoid unpleasant stimuli (e.g., demands.). It has less utility, if any, as an intervention to address challenging behavior maintained by automatic reinforcement (e.g., sensory consequences). PECS is a communication system specifically designed to support nonverbal or minimally verbal individuals and has been successfully implemented across a wide range of challenging behavior severities.

**Caregiver, context, and practical considerations.** PECS is appealing for several reasons: (1) the system requires few complex motor movements on the part of the speaker and does not require the listener to be familiar with an additional language such as sign language; (2) the PECS system
has a relatively low cost and is portable and suitable for use in many settings; (3) case reports indicate that the system can be taught relatively rapidly; and (4) the PECS system incorporates functional communicative responses that promote meaningful interactions between the child and the environment. Research suggests that caregivers can implement PECS with high procedural integrity.

**Prompting (including Time Delay)**

*Description.* Prompting is a board term that includes anything that aids an individual to correctly complete a task or comply with an instruction or rule. There are many different prompting strategies that include visual prompts, verbal prompts, gestural prompts, modeling prompts, partial physical prompts, full physical prompts, textual prompts, etc. Common prompting procedures include:

1. Least-to-most prompting, is when the therapist/caregiver/teacher starts with the least intrusive prompt (e.g., visual prompt) and moves up the prompting hierarchy until compliance is achieved

2. Most-to-least prompting sometimes referred to as errorless prompting, is when the therapist/caregiver/teacher starts with a controlling prompt (i.e., prompt that when used will produce a correct response) and moves down the prompting hierarchy as compliance is consistently achieved

3. Time Delay prompting is a specific type of errorless prompting where the therapist typically starts by setting up the establishing operation (i.e., restricting access to the functional reinforcer) and delivering a prompt to emit the communicative response (e.g., “Toy please”) following a specified delay. Typically, the therapist sets the initial time delay at 0 s and then increases the delay based on the individuals’ performance.

*Examples from the literature.*


**Intervention type.** Prompting is a specific antecedent intervention that can either be used as a standalone treatment but is more likely to be included as a component in a larger treatment package.

**Behavioral mechanism(s).** Discriminative control, sometimes referred to as instructional control when it comes to prompting, is the likely mechanism for behavior change. Prompting is often used when teaching new skills but is also used when stating contingencies, or to help an individual to stay or get back on task in demand situations. Discriminative control occurs when a specific discriminative stimulus (in this case the prompt) is paired with specific consequences.

**Severity and behavioral function considerations.** Prompts can be used across a variety of functions; however, they are most commonly used as part of a treatment package to address escape-maintained behavior. More specifically least-to-most prompting (e.g., 3-step) is often used to implement escape extinction. When prompting is used to implement extinction, it can sometimes be difficult to follow through with the physical prompt if individuals is either large or engages in more severe forms of challenging behavior. In situations in which it might not be safe to provide physical guidance, modified prompting procedures can be used that don’t require physical guidance such as a nag prompt or only using verbal and model prompts.
**Caregiver, context, and practical considerations.** There is a wide variety of prompting procedures which allows for different prompts to be chosen based on the characteristics of an individual. When considering if a verbal, model, textual, physical or some combination should be used the clinician/caregiver should consider the age, cognitive functional level, level of receptive language, size of the individual, the amount of instructional control prompts have, etc. Each of these factors can influence the type of prompt(s) that should be used to increase compliance or teach a new skill.

**Reinforcement**

*Description.* Reinforcement includes the contingent presentation of a stimulus following the occurrence of a response that results in an increased likelihood of that response. This behavioral mechanism is used to build up or support appropriate behavior in an attempt to replace challenging behavior. While listed as an EBP by several sources, reinforcement rarely occurs as a procedure on its own. Instead, reinforcement as a procedure appears across several of the described EBPs in this document, including FCT and differential reinforcement. In the context of intervention for challenging behavior, the response selected for reinforcement is typically an appropriate response that serves as an alternative to challenging behavior. The reinforcer is typically identical to the reinforcer maintaining challenging behavior or is a reinforcer more valuable to the individual than the reinforcer(s) obtained following challenging behavior.

*Examples from the literature.*

See FCT, DRA/I/O, and Self-Management sections.

*Intervention type.* Reinforcement is typically implemented as a component of a larger intervention package that includes extinction for problem behavior or a concurrent reinforcement schedule arrangement.
Behavioral mechanism(s). Reinforcement.

Severity and behavioral function considerations. Reinforcement can and has been incorporated as a component of intervention across varying severities of challenging behavior. Likewise, it has been included in treatment packages designed to address challenging behavior maintained by social and non-social sources of reinforcement. In situations addressing socially maintained challenging behavior, the reinforcer incorporated is typically the functional reinforcer. However, in some implementations, the reinforcer available is a reinforcer more potent than the functional reinforcer or a combination of reinforcers, including functional and arbitrary (i.e., reinforcers that have been demonstrated to impact responding but are unrelated to challenging behavior) reinforcers. In situations addressing non socially mediated challenging behavior, the reinforcer available is one that has been demonstrated to compete effectively with challenging behavior or be more valuable than engaging in challenging behavior.

Caregiver, context, and practical considerations. Typical implementation of reinforcement-based interventions requires ongoing monitoring by a caregiver so that reinforcement can be delivered when the targeted, appropriate response is exhibited. Thus, caregivers with competing responsibilities may struggle to implement effectively. Initially, most reinforcement-based interventions require a dense schedule of reinforcement (i.e., reinforcers are delivered frequently and/or after each occurrence of the target response). This initially dense reinforcement schedule can result in disruption to ongoing activities. However, successful strategies to thin the schedule of reinforcement delivery have been described in the literature, including delays to reinforcement, increasing the response requirement, and specifying time intervals during which reinforcement is available using schedule correlated stimuli (i.e., a multiple schedule).

Response Interruption and Redirection
Description. Response interruption and redirection (RIRD) is an intervention used to reduce behaviors that are repetitive and stereotypical and that interfere with a person’s daily life.

Examples from the literature.


Intervention type. There are two components that make up RIRD, response interruption and redirection. Sometimes other components might be used such as a token economy or prompting. In response interruption an effort is taken to prevent the behavior from occurring. For example, a teacher might block a person’s attempt to scrape their skin. Redirection follows blocking and involves prompting the person to engage in an alternative behavior.

Behavioral mechanism(s). RIRD is effective due to one or more of the following mechanisms: (a) punishment (b) differential reinforcement. First, response interruption likely decreases the occurrence of the target behavior because the blocking of the attempt serves as punishment. Second, an alternative response is differentially reinforced through the redirection component.
Severity and behavioral function considerations. When challenging behavior poses minimal risk, RIRD can safely be implemented. If the target behavior results in tissue damage, then protective equipment may be necessary to minimize risk of further injury. If an individual engages in other forms of target behavior not targeted through RIRD, those behaviors may increase when the target response is blocked, and so it may be important to intervene on those behaviors prior to implementing RIRD. Because RIRD generally is used for behavior that is automatically reinforced and considered stereotypical, the “reason” the behavior is occurring should be considered prior to use of this intervention. For example, if a stereotypical behavior is not dangerous and may serve as a means of coping with environmental events (e.g., rocking or covering ears in response to loud noises), then intervention may not be justified. In fact, unless the targeted behavior is dangerous or causing significant disruption of learning, then use of RIRD likely is not warranted.

Caregiver, context, and practical considerations. RIRD requires that the implementer be continuously available to respond quickly, and so it is not feasible for a caregiver (e.g., teacher, parent) to implement RIRD if they have other responsibilities or tasks they must engage in. Therefore, RIRD may be most appropriately delivered in a clinical setting initially and, after it has been found to be effective, then generalized to other settings. In addition, recent research (Wunderlich & Vollmer, 2015) suggests that RIRD may be less effective than initially indicated, and so use of this intervention should be considered carefully prior to implementation.

Self-Management

Description. Self-management involves an individual monitoring, recording, and reinforcing their own behavior. In their meta-analysis, Carr (2016) noted that there is evidence to list self-management as an emerging intervention for challenging behavior exhibited by individuals with ASD.
**Examples from the literature.**


**Intervention type.** Self-management is often implemented as a multi-component intervention that includes the aforementioned components of monitoring, recording, and accessing earned reinforcers.

**Behavioral mechanism(s).** Self-management is effective likely due to reinforcement encountered during its implementation. It is important to note that reinforcement can derive from multiple sources, including the programmed reinforcer for achieving the performance criterion, feedback provided from the recording of behavior change in a therapeutic direction, or access to other unprogrammed environmental reinforcers as challenging behavior diminishes.

**Severity and behavioral function considerations.** Given its emerging nature as an intervention for challenging behavior, clear information does not exist regarding the severity of challenging behavior for which this intervention would be appropriate. However, based on the self-directed nature of the program, it is likely most appropriate for mild to moderate challenging behavior. The bulk of the existing published studies related to self-management for challenging behavior applied the intervention to behavior maintained by automatic reinforcement.

**Caregiver, context, and practical considerations.** The caregiver may not directly implement the intervention, but they may need to be available to provide updates to the program (e.g., changing the performance criterion that results in the programmed reinforcement) and monitoring procedural integrity to ensure that the individual implementing the program does so with accuracy. Context has not been specifically evaluated as a variable.
impacting efficacy. However, self-management should be an intervention that cuts across contexts as the individual is responsible for its implementation. However, some oversight to ensure accuracy will be needed.

**Time Delay.** See “Prompting”

**Visual Supports.**

*Description.* Visual supports (VS) are objects or pictures/symbols that can be seen and/or held, which are used to provide information visually to enhance an individual’s understanding of: the physical environment; people and the social environment (communication, words, actions, rules and expectations and spoken or unspoken intentions or expectations) and more abstract concepts, such as the passage time, a sequence of events or socially abstract concepts such as emotions or reasons to do something in a particular way. They are either ‘low-tech’ – objects, photos, pictures, symbols, or written words – or ‘high tech’ – on electronic devices. VS have the potential to increase an individual’s understanding of expectations, reduce anxiety, facilitate participation, support communication and increase independence, thereby reducing the risk of challenging behavior and supporting inclusion.

*Examples from the literature.*


**Intervention type.** Visual supports can include pictures, written lists, or timers that can serve as a reminder of a pending transition or a certain activity in the daily routine. The use of these cues can prevent behavioral problems and promote the individual’s independence and acquisition of daily living skills. For example, visual supports can help the individual’s ability to process information about the sequence of events, which can provide a sense of predictability and promote flexibility. Visual supports can be used to set up choices (e.g., a choice board), time passage and sequencing (e.g., timers, first-then board), and step-by-step presentation of daily routines (e.g., visual schedules, social stories). For example, developing a set of pictures showing the steps of the morning routine can remind the individual what needs to be done before going to school, avoiding confusion, and promoting compliance. Setting a timer that signals the end of 20 minutes of computer time may be more effective than abruptly telling the individual to turn off the computer.

**Behavioral mechanism(s).** Visual supports are preventive strategies designed to avert the occurrence of behavioral problems by modifying the antecedents of the behavior problems. In research on VS, “on-schedule” behaviors (engagement with tasks or activities that corresponded with the current page of the VS or correctly completing steps of a task analysis for correct use of the VS) and “on-task behaviors” (visually attending to or appropriately manipulating scheduled materials, visually attending to, or manipulating the, VS and transitioning between scheduled tasks or activities) have served as dependent variables. VS interventions usually include systematic prompting procedures to teach correct use of the materials, as well as graduated guidance procedures. VS can also provide structure, routine and sequence that many autistic individuals need to engage in daily activities, thus supporting individuals in unpredictable and changing environments.

**Severity and behavioral function considerations.** Although individuals may need personal motivation to engage with them, to be taught their meaning and how to use them, VS which match the individual’s developmental stage are tools designed to help acquire a myriad of skills. Clear information does not exist regarding the severity of challenging behavior for which this intervention would be appropriate. However, there is data
to support the appropriateness of VS for mild to moderate challenging behavior as well as published studies related to VS for challenging behavior applied the intervention to behavior maintained by escape (task avoidance).

_Caregiver, context, and practical considerations._ VS interventions have been implemented in various contexts (i.e., play, leisure, academics) and settings (i.e., home, community, and school), and have been successfully implemented by caregivers and school staff. VS may initially require an adult to be in physical proximity to a child from the initiation of a task or activity until the conclusion of the activity. VS may be low cost, adaptable, portable and applicable across contexts, making communication physical and consistent. VS can be implemented as a standalone strategy or, as is more commonly the case, seamlessly integrated with other individualized approaches.

**Examples of Intervention Packages that Utilize EBPs**

In the previous section, specific EBPs were described relative to their use as interventions or intervention components related to challenging behavior exhibited by individuals with ASD. While important to understand which approaches to intervention are supported by empirical evidence, it is also important to be aware that these EBPs are often incorporated into manualized and/or more comprehensive treatment packages. In the information that follows, approaches supported by at least one RCT (as reported in Tarver et al., 2019) are briefly described. In addition, an in-depth description of one package (RUBI) is provided as an example of how multiple EBPs can be incorporated into one of these packages. This in-depth example is not intended as an endorsement of one approach over another and is intended for illustrative purposes only.

**Behavioral Parent Training**
For challenging behavior that does not result in immediate danger and/or harm, behavioral parent training (BPT) may be appropriate and helpful. BPT is a parent-centered intervention that (a) emphasizes the parent as the primary change agent throughout the course of intervention, (b) is manualized, and (c) is time limited (typically requiring between 10 and 16 weeks to complete). Most often, BPT is delivered across weekly sessions in which a clinician works directly with parents. There are several BPT programs with strong evidence for families of neurotypical children (e.g., Incredible Years, Parent Child Interaction Therapy, Parent Management Training). However, evidence for BPT for parents of children with ASD is only now emerging. Tarver et al. (2019) conducted a meta-analysis of BPT programs for addressing challenging behavior exhibited by children with ASD. Their results noted that BPTs, including Child Directed Interaction Training (CDIT; PCIT), reduced disruptive behavior in one or more randomized controlled trial.

Three interventions, CDIT, PCIT, and Parent Management Training, have been designed for and/or shown to be effective for children who demonstrate the ability to communicate verbally and/or demonstrate expressive language skills. CDIT is a play-based intervention in which parents are taught to set up positive and proactive play experiences through which to model and reinforce desired skills. This intervention has been shown to be effective for families of children on the autism spectrum between the ages of 3 and 12 years old with demonstrated cognitive functioning at the age of 2 years or older and who could speak at least three words (Ginn et al., 2017). PCIT is a well-established BPT program that teaches parents both the skills of child-directed interaction and has a compliance training portion through which parents are taught to implement a timeout following noncompliance. Solomon et al. (2008) demonstrated that PCIT was effective for reducing disruptive behavior exhibited by young children (between the ages of 5 and 12) with IQ scores equal to or greater than 70 (average IQ) and with good receptive and expressive language skills. Sofronoff et al. (2016) worked with parents of children who had a diagnosis of Asperger Syndrome using an intervention they termed Parent Management Training. Importantly, this intervention is distinct from the well-established Parent Management
Training for Disruptive Behavior (Forehand & Long, 1988). This intervention involved teaching parents skills to prevent and respond to challenging behavior as well as how to use comic strip conversations (Gray, 1994a) and social stories (Gray, 1994b). This parent training intervention resulted in significant reductions in disruptive behavior.

Five interventions, C-HOPE, SSTP, PCSSTP, and RUBI (detailed later) have efficacy supporting their use for broader range of families of children on the autism spectrum. COMPASS for Hope (C-HOPE) is a BPT program designed to be delivered in a combined group and individual family format via telehealth across 8 weeks. Parents are provided with psychoeducation regarding autism and evidence-based interventions and are taught strategies to promote desired behavior and reduce challenging behavior. Kuravackel et al. (2018) demonstrated that C-HOPE was effective for reducing disruptive behavior of children between the ages of 3 and 12 years old with ASD.

Triple P (Positive Parenting Program) is a well-established parent training program that has been adapted for use by families of children with ASD. Steppingstone Triple P (SSTP) is delivered across nine sessions delivered weekly in a combination of group and individual formats. Sessions focus on teaching parents strategies to encourage desired behavior and prevent and discourage challenging behavior and has been shown to reduce challenging behavior exhibited by children with ASD in a randomized controlled trial (Whittingham et al., 2009). A brief version of SSTP, Primary Care Stepping Stones Triple P; PCSSTP) also exists. In PCSTTP a clinician helps a parent identify one or two specific concerns (e.g., aggression) that are focused on across brief, 15- to 30-min sessions. This intervention has been found to be effective in several randomized controlled trials (Tellegen & Sanders, 2014; Zand et al., 2018). RUBI is a 14- to 16-week parent training program through which clinicians teach parents specific skills to promote desired behavior and prevent challenging behavior. RUBI also includes optional sessions focused on common concerns such as addressing sleep problems, toileting, and mealtime concerns. RUBI has been found to be effective for reducing challenging behavior in a randomized controlled trial (Bearss et al., 2015) and is discussed in detail below.
BPT Clinical Trial References


RUBI

RUBI is a packaged, parent-mediated outpatient program (1-hour session per week) delivered one-to-one (therapist to caregiver) that is grounded in applied behavior analysis. RUBI involves therapists teaching caregivers how to implement a range of behavioral strategies over 11
core and 7 supplemental (focal-problem) sessions (e.g., toileting, feeding, sleep issues) in order to build a caregiver behavioral management “toolbox.” RUBI emphasizes: 1) tailoring the intervention to the child; 2) identifying behavioral function instead of topography to inform behavioral strategy choice (i.e., targeting what is “driving” the behavior, instead of the behavior itself); and 3) decreasing behavioral excess as well as increasing appropriate behaviors. In the first session of RUBI, caregivers learn to identify the function(s) of a behavior by analyzing its antecedents and consequences. Subsequent sessions present strategies for preventing disruptive behavior (e.g., visual schedules for routine events), positive reinforcement for appropriate behavior, planned ignoring of inappropriate behavior, and techniques to promote compliance. In the final sessions, the therapist instructs caregivers on how to teach new daily living skills and how to maintain improvements over time. RUBI uses a behavioral skills training approach, which includes direct instruction, modeling, role-play and practice with feedback in order to effectively train caregivers in the various RUBI skills. Sessions also have accompanying video vignettes that are used to illustrate skills or test parental understanding of session materials. Every session ends with creation of a homework assignment where parents track their daily implementation of the strategies during the week.

RUBI was initially tested in a multi-site feasibility trial with 17 children aged 4 to 13 years old followed by a six-month, randomized trial comparing risperidone to risperidone plus RUBI in 124 school-age children with ASD and serious behavioral problems, defined as having an Aberrant Behavior Checklist-Irritability (ABC-I) subscale raw score of 15 or greater. In that study, risperidone plus parent training was superior to drug only. RUBI was then revised for younger children with ASD and co-occurring disruptive behaviors under the assumption that a downward extension of the manual may prevent the emergence of more severe behaviors in school-age children and avert the need for medication. An open pilot trial of RUBI as a stand-alone treatment in 16 children with ASD between the ages of 3 and 7 years supported its feasibility and initial efficacy. The RUBI Autism Network then launched a NIMH-funded multisite trial in 180 children (age 3 to 7 years) with ASD and disruptive
behavior. Participants were randomly assigned to RUBI or a structured parent education program (PEP) for six months. While both groups improved by Week 24, RUBI response was significantly higher (69% of children in RUBI were rated as “much improved” or “very much improved” compared to 40% in PEP).

Table 1 illustrates RUBI outcomes across the four trials. Clinically and statistically significant reductions in disruptive behavior from Baseline to Week 24 were noted on the ABC-I across the four trials (within subject effect size ranged from 0.9-2.7). Parents attended a majority (84-93%) of the sessions and attrition was low (e.g., 10% in our large-scale randomized trial of 180 children). Therapist adherence to the intervention was high, ranging from 93-97% across the four trials. This research demonstrates that caregivers can be successfully taught to implement a variety of intervention strategies that are grounded in ABA principles and provide strong evidence that RUBI significantly reduces disruptive behavior, parents are engaged in treatment, and therapists can reliably deliver RUBI to parents. Further, moderator analyses of RUBI indicated the intervention is effective with children with average as well as impaired cognitive functioning (IQ<70) and mild to severe autism symptoms, suggesting applicability with a wide range of youth with ASD.

| Table 1. Trials of RUBI in Children with ASD and Disruptive Behavior |
|-------------------|------------------|------------------|-----|-----|
|                  | N                | Baseline M (SD)  | Week 24 M (SD) | ES  | p   |
| 2007 Pilot       | 17               | 24.3 (9.3)       | 16.1 (9.5)     | 0.9 | <.01|
| 2009 Drug +      | 75               | 29.3 (7.0)       | 11.0 (6.6)     | 2.7 | <.001|
Example of a Severe Behavior Treatment Plan

Programs to address more severe challenging behavior are less likely to be packaged as part of a manualized approach to intervention. Instead, these programs are individualized and tailored to the specific function(s) of challenging behavior exhibited by the person and the specific safety concerns those behaviors may pose. This section provides an example of a treatment plan used to address severe challenging behavior.

**Background and Outcomes**

Desmond (pseudonym) is an 8-year-old male diagnosed with Disruptive Behavior Disorder and Autism Spectrum Disorder. He was admitted to the Center’s Challenging Behavior Program on **/**/**** for the assessment and treatment of Aggression, Disruption, Self-Injury, and Negative Vocalizations. Desmond has a history of engaging in these challenging behaviors. A functional analysis was completed during the admission with results indicating that he will engage in Aggression, Disruption, Self-Injury, and Negative Vocalizations to access adult attention and tangible items.

**Caregiver Goals**

Each caregiver goal is listed below in addition to whether or not this goal was met during the admission.
1. Desmond will comply with a demand without becoming aggressive or having mom scream or have to threaten to take away an item at least 80% of the time.
   **Goal Met: Yes**

2. Desmond will not bother mom when she tells him she is not available at least 80% of the time.
   **Goal Met: Yes**

3. Desmond will give up his tablet for at least 30 minutes with at least an 80% reduction in challenging behavior and will engage in an alternative activity when his tablet is removed.
   **Goal Met: Yes**

**Process Goals**
Each process goal for the program is listed below, in addition to whether or not this goal was met during the admission.

1. Functional Behavioral Assessments (FBA) were conducted to identify the potential variables that contribute to the Desmond’s challenging behavior. When possible, a Functional Analysis (FA) was conducted; however, when an FA was not feasible other FBA methods were used to identify function.
   **Goal Met: Yes**

2. Based on the results of the FBA, a treatment package was developed.
   **Goal Met: Yes**

3. The treatment package was generalized throughout the Center and to the home or community.
   **Goal Met: Yes**

4. Caregivers were trained to implement the treatment package.
   **Goal Met: Yes**

**Reduction in Challenging Behavior**
The following treatment recommendations resulted in a 94% reduction in Desmond ’s challenging behavior when implemented consistently in a controlled setting, and a 51% reduction in behavior when implemented consistently in a naturalistic setting.
## Operational Definitions of Challenging Behavior

### AGGRESSION

Any attempt or instance in which Desmond:

- **Hitting**: Forceful hand (open or closed) contacts another person’s body from a distance 6” or greater (each hand is one instance). This excludes shoes/feet.
- **Kicking**: Forceful foot comes into contact with another person from a distance of 6” or greater (each foot is one instance).
- **Biting**: Top or bottom teeth come into contact with a person’s skin or person’s clothing.
- **Pinching/Scratching**: Fingers (at least 2) closing around another person’s skin by at least an inch. Nail(s) contact another person’s skin and drags across that person’s skin 2” or more.
- **Head butting**: Head comes into contact with another person’s body from a distance of 6” or greater.
- **Push/Pull**: Body/body part contacts another person’s body/clothing/item in hands and pulls or pushes the person, resulting in the person’s body being displaced.
- **Hair-pulls**: Hand(s) or fingers contact with someone’s hair and pulls away from their scalp.

### SELF-INJURIOUS BEHAVIOR

Any attempt or instance in which Desmond:

- **Head-Banging**: Head contacts a surface (including his own body) from a distance of 6” or greater; includes falling to floor to head bang on floor.
- **Hand to Face/Head**: Hand (open or closed) contacts face/ head from a distance of 6” or greater.
- **Biting**: Top or bottom teeth come into contact with skin or clothing.
- **Choking**: Wrapping one or both hands around his neck and applying force.
| **DISRUPTION** | Any attempt or instance in which Desmond:  
- **Kicks/Hits Object:** Forceful foot or hand(s) comes into contact with another object from a distance of 6” or greater and it does not come within 2” of a person (outside of appropriate toy play; i.e., yoga ball)  
- **Throws Object:** Forceful expulsion of object from hand from a distance of 6” or greater and it does not come within 2” of a person (outside of appropriate toy play; i.e., basketball)  
- **Swipes Object:** Forceful open/closed hand/arm comes into contact with another object in a sweeping motion from a distance of 6” or greater and the object does not come within 2” of a person (outside of appropriate toy play)  
- **Biting Objects:** Top or bottom teeth come into contact with an object that is non-edible  
- **Taking Timer:** Any instance when Desmond lifts/holds the timer 6” or greater from the table and/or begins to push buttons to start/stop the timer |
| **ELOPE** | Any attempt or instance in which Desmond:  
- Desmond attempts to or walks or runs more than 3 feet away from the therapist and/or task demand.  
Any instance in which Desmond’s hand(s) grasps the door handle in an attempt to elope from the space he is assigned |
| **VERBAL THREATS** | Any attempt or instance in which Desmond verbally threatens any individual with harm |
| **NEGATIVE VOCALIZATIONS** | Any instance in which Desmond screams (i.e., raises his voice louder than a conversational level), curses and/or verbally refuses to do a task (record even if he is doing a task and also verbally refusing task). Some examples include:  
- “No”  
- “I don’t want to”  
- “I’m not going to do that” |
### Dangerous Acts

Any attempt or instance in which Desmond

- Has a part of his body (hands or feet) touching furniture or a windowsill without one or both of his feet touching the ground. Each instance of his body touching a new surface is counted as another instance. This excludes occurrences when his head or his shoulders are still touching the ground.
- This includes any instance in which Desmond attempts to lift his foot/feet off the ground when touching a piece of furniture or elevated surface.

**Note:** excludes sitting in a chair, sitting/laying on a couch, or sitting/laying/standing on toys/furniture in which it is appropriate (e.g. trampoline and beanbag)

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### Making the Environment Safe for Desmond

Desmond’s environment should be arranged to minimize opportunities for his challenging behavior.

**General Recommendations**

- When entering a new environment, scan for exits and items that could be problematic for Desmond.
- Natural barriers such as furniture should be used as a way to show Desmond his boundaries in the home and school environment.

**Safety and Security Recommendations**

- Locks can be installed in high-reach locations to prevent Desmond from exiting various locations within the home as well as exiting the home.
- Alarms can be installed in windows and doors to alert you when Desmond has exited specific locations of the home.

**Protective Training**

- When Desmond becomes aggressive, immediately use the Personal Protective Procedures (PPP).
- Refer to the PPP document provided for reminders of specific procedures.
- Contact the Case Manager if you feel a refresher on the procedures is necessary.

**Trips into the Community**

- Prior to leaving the home, make sure you have treatment materials (i.e., multiple schedule card, icons, any tangible item that is needed on the outing).
When in the community setting, you should always remain within one arm length’s distance from Desmond.
The community setting is just one more environment in which Desmond rules are the same. Desmond treatment strategies should be in place in the community like they are in the home.

**Visual Supports**
- Visual supports can help communicate to Desmond the various elements of his treatment strategies, including contingencies and expectations.
- Timers can help signal when items will become either available or unavailable and when certain activities will start or stop.
- Daily schedules can show Desmond what activities have been finished and what activities are coming up next.

**Demands**
- When giving a demand to Desmond the following should be considered:
  - Am I (the caregiver) able to follow through with getting him to comply with the demand if his behavior escalates?
  - Is it safe for me to manage challenging behavior in the current environment?
  - Do I have the energy/correct mental status to follow through with getting him to comply with the demand if his behavior escalates?
- If the answer is no, consider waiting until another adult is available to help you with Desmond’s behavior or consider doing the demand yourself.

**Treatment Recommendations**

**Extinction**
Do not provide access to preferred items, attention, or escape from work when Desmond is engaging in challenging behavior, to calm him down.
- Preferred items: do not provide access to his tablet or his toys
- Attention: do not make comments (e.g., “stop it, I don’t like that”), provide physical attention (e.g., hugs, back rubs), roll your eyes or discuss challenging behavior with others in front of him (e.g., “Did you see that?”)
- Escape from work: do not provide a break from demands and use Three-Step (see below)

**Three-Step Guided Compliance**
There are three separate steps or levels of prompts used in this procedure: a verbal prompt, a model prompt, and a physical prompt. A simple way to remember these steps is: Tell; Show; Do.

**Step 1: Tell**
Tell Desmond what you want him to do. Make the demand specific but simple to understand, and do not phrase it as a request or question. For example, say “Pick up the book.”

- If he complies with the task, provide praise.
- If he does not comply in 3-5 sec, move on to step 2.

**Step 2: Show**
Show Desmond what you want him to do by modeling it yourself while repeating the instructions. For example, “Pick up the book like me. Now you do it.” Make sure you reset the materials after you have modeled completing the task, so he has an opportunity to comply.

- If he complies with the task, provide praise.
- If he does not comply in 3-5 sec, move on to step 3.

**Step 3: Do**
Use hand over hand guidance to have Desmond complete the task while repeating the instructions. For example, say “Pick up the book like this” while using hand over hand guidance to prompt Desmond to pick up the book.

- Do not provide praise.

**Tips**
- Follow through with the completion of one task before placing another demand.
- Do not place a demand unless you are physically able to follow through with the 3rd step. For example, never instruct Desmond to stand up if you cannot lift or physically follow through with the demand.

**Green Card/Black Card/Blue Card Rules for Tangibles/Attention with Response Cost and Resetting DRO**

**Materials:** green/black card, electronic (e.g., tablet, Alexa, toys), icons

**Green Card Rules**

**Step 1:** Place either the attention or tangible or both icons on the green side of the stimulus card.

**Step 2:** State the rules to Desmond by saying, “Tablet and/or Attention and/or toys are on the green card rules. That means you can ask for [electronics]/[play].”

**Step 3:** If Desmond engages in challenging behavior during this time, restrict the items and place icons on the black card and follow those rules (listed below)
**Step 4:** Provide access to available electronics and/or attention when Desmond requests appropriately.

**Black Card Rules**

**Step 1:** Place icon(s) on the black card rules at a time. Unless it is a work session, at least one icon (i.e., toys) should be on the green side when other icons are on black.

**Step 2:** If Desmond requests for restricted items or attention, his requests should be ignored.

**Step 3:** If Desmond engages in challenging behavior during this time, the timer should be reset, and you should state, “Okay, you have to wait longer” in a neutral tone. If less than five minutes have elapsed since the initial setting of the timer, reset for the full time (i.e., if the timer was set for 25 minutes and Desmond aggressed after 2 minutes elapsed, the timer should be reset to 25 minutes). If more than 5 minutes have elapsed since the initial setting of the timer, 5 minutes should be added to the time (i.e., if the timer was set for 25 minutes and Desmond aggressed after 10 minutes elapsed, the timer should be set for 20 minutes).

**Blue Card Rules**

**Step 1:** When it is time to tell Desmond to do something, all icons should be placed on the black side of the card. A blue card should be placed on top of the green/black card.

**Step 2:** Tell Desmond, “It’s time to do some work, blue card is out.” Then issue the demand by stating, “Do/Vacuum/Wipe/Clean (etc.) ________.”

**Step 3:** If Desmond complies, continue to work and issuing demands as needed until the task is completed. If Desmond does not comply, begin 3-step guided compliance.

**Step 4:** If Desmond engages in challenging behavior, tell him, “Okay, you have more work to do” in a neutral tone. Add on 2-3 tasks for him to do before he has completed the task.

**Step 5:** Once Desmond has completed all of the work, remove the blue card and state, “Blue card is going away, your items are available.” Move all icons over to the green side of the card.
Note: After every work session, icons should always be moved to green and Desmond should always be able to access his preferred items for at least 2 minutes before putting all items on the black side again. Until caregivers are healthy and able to consistently follow through with 3-step guided compliance, only essential demands should be placed on Desmond. That is, only demands he absolutely needs to do in order to be successful such as getting dressed, going to the car, brushing teeth, taking a bath/shower, etc.

Three-Step Cheat Sheet

Step 1: **TELL**: 
*Verbally Prompt* Desmond by stating exactly what you want him to do.

Step 2: **SHOW**: 
Use a *Gestural Prompt* to show Desmond what you want him to do.

Step 3: **DO**: 
*Physically Prompt* the action with Desmond
## Data Sheets

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<th>Did Desmond Disrupt in the last hour?</th>
<th>Was Desmond Non-Compliant in the last hour?</th>
<th>Please indicate how intense the challenging behavior was (1 = Low; 2 = Mild; 3 = Moderate; 4 = High)</th>
<th>Notes</th>
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**Treatment Materials**

Materials included:

- Green/Black Stimulus Card
- Icons (including: tablet, mom, grandma, food, Alexa, and toys)
- Blue Card
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<thead>
<tr>
<th>Factors that May Influence Referral to Higher Intensity Services</th>
<th>Behavior</th>
<th>Intervention</th>
<th>Individual</th>
<th>Caregiver/Family</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Automatic function</td>
<td>- Complex assessment/treatment planning needs</td>
<td>- Significant cognitive/language impairments</td>
<td>- Caregiver mental health concerns</td>
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<tr>
<td>- Negative social impact (e.g. stigmatizing behaviors)</td>
<td>- Multiple providers needed to implement the treatment plan</td>
<td>- Behavioral/emotional comorbidities</td>
<td>- Caregiver physical health/mobility concerns</td>
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<tr>
<td>- Legal risk (e.g. sexual behaviors)</td>
<td>- Life threatening</td>
<td>- Older age</td>
<td>- Caregiver cognitive deficits</td>
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<tr>
<td>- High risk of harm to others or destruction of environment</td>
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<td>- Physical size</td>
<td>- Caregiver advanced age</td>
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<tr>
<td>- Treatment resistance with lower-tier service</td>
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<td>- Medical comorbidities</td>
<td>- Incongruence between caregivers on behavior plan implementation</td>
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<tr>
<td>- Social function</td>
<td>- Function of behavior can be easily/clearly identified through descriptive/indirect assessment methods</td>
<td>- Average cognitive/language skills</td>
<td>- Multiple caregiver engagement with agreement in treatment plan</td>
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<tr>
<td>- Function of behavior is singular</td>
<td>- Low complexity (e.g. manualized) intervention</td>
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<td>- Prior exposure/training in behavior analytic procedures</td>
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<tr>
<td>- Function of behavior is singular</td>
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<td>- Ability to implement procedures with high fidelity</td>
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<td>- Lack of access community to more intensive services</td>
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<td>- Financial resources that allow for engagement in multiple treatment services</td>
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<tr>
<td>Table 2. Behavior Categories</td>
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<tr>
<td><strong>Definition</strong></td>
<td><strong>Example Topographies</strong></td>
<td><strong>Service Model Examples</strong></td>
<td><strong>Exemplar demonstrating role of behavior frequency, force, duration, impact, etc. on categorization</strong></td>
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</tbody>
</table>
| **Mild** | Carries little risk of harm and/or result in little to no damage to the individual, others, or environment. | -Crying  
-Screaming  
-Tantrums  
-Tearing paper  
-Throwing small items  
-Cursing  
-Teasing  
-Noncompliance | -Psychoeducation  
-Descriptive/indirect assessment to hypothesize function of behavior  
-Weekly outpatient behavioral support with individual therapist | -4-year-old hitting caregiver with a closed fist one time per day resulting in temporary red spot on caregiver’s leg |
| **Moderate** | Results in some physical harm/tissue damage to the individual or others, moderate damage to the environment, and/or some risk of safety, but does not require consistent medical attention or is not life-threatening. | -Head banging that leaves a red mark but no bruising  
-Biting that does not break the skin  
-Elopement within confined environments (e.g. school building)  
-Pica (e.g. paper) | -Descriptive/indirect assessment or brief functional analysis to hypothesize function of behavior  
-One to three outpatient visits per week with individual therapist; Intensive outpatient (5 days/week for a discrete amount of time, e.g. 2 weeks) with a treatment team | 3-year-old hitting her temple 20-30 times per day, resulting in a permanent red mark/abrasion on her temple |
| **Severe** | May result in significant damage or bodily harm to the individual or others (requiring medical attention), high risk of safety, or significant damage to the environment. | -Choking  
-Head-butting  
-Pica (e.g. sharp objects)  
-Elopement toward danger (e.g. water, roads) | -Experimental functional analysis to hypothesize function of behavior  
-Daily inpatient or intensive outpatient services 5 hours/day, 5 days/week with treatment team | 17-year old hitting caregiver 15 times per day. Caregiver’s arm is broken when attempting to block hit, requiring trip to the emergency room |
Additional References


Steinbrenner et al. (2020) Evidence based practices


