STANDARD INTERVENTIONS FOR EXECUTIVE FUNCTION

There are a growing number of intervention strategies for attention and executive function deficits. Listed below are many of the interventions which have been found to be most effective and reasonable to implement. The interventions are categorized within specific areas of deficit, however many have a remedial effect on a number of problems simultaneously. These skills are typically best taught in the context of everyday executive routines as opposed to teaching the specific skill out of context.

A general framework that can be utilized while working on specific executive skills is the Goal–Plan–Do–Review System (Ylvisaker, Szekeres, & Feeney, 1998). A worksheet that can be used when working with students is attached at the back of this checklist and follows the format developed by Ylvisaker, et.al, 1998 and Isquith, Gioia, & PAR, 2002. This system promotes a) systematic goal definition, b) planning, c) action, d) self-monitoring/evaluating, and e) flexible and strategic adjustment of plans and actions for future task completion. Specific definitions of these areas of functioning are as follows:

- GOAL SETTING: This refers to an initial decision about the choice of a goal to pursue. (What do I need to accomplish?)

- SELF-AWARENESS OF STRENGTHS AND WEAKNESSES: Recognition of one's stronger and weaker abilities and decision making about how easy or difficult it will be to accomplish the goal.

- ORGANIZATION/PLANNING: An organized plan needs to be developed including consideration of what materials are necessary, what steps need to be completed and in what order, and how long will it take to complete the task.

- FLEXIBILITY/STRATEGY USE: Identification of possible obstacles that may arise and the manner of how problems can be solved. This can refer to how additional information can be obtained from people including teachers, parents, or peers as well as additional resources to be obtained. This can also involve the general development of flexibility in pursuing alternative courses of action when the initial plan fails or needs to be modified.

- MONITORING & SUMMARIZING: During the task the student is encouraged to assess the accuracy and rate of progress. At the completion of the task there is a review of the goal, the plan, and what was accomplished. An assessment is made of what did or did not work and why. There is also consideration as to how the approach to the task may be modified in the future to complete similar tasks in the most effective and efficient manner.

Below is a listing of specific executive function skills and appropriate interventions to improve these areas of functioning.

Inhibit: Inhibition is the ability to resist impulses and to stop one's own behavior at the appropriate time. Specific helpful intervention strategies include the following:

- Increase awareness of appropriate behavior through the provision of more explicit, specific and clear set of rules and expectations. These expectations should be reviewed regularly, especially in novel situations or when impulsive behaviors persist.
- Regular cuing and feedback to the student is necessary to highlight the need to control impulses. This input can be verbal, visual, tactile or through the use of a behavior modification system. Verbal cues could include statements such as "Please raise your hand before you shout out an answer" or " When you talk to me without listening to all that I have to say it frustrates me." Visual cues can include holding up a finger or hand to cue the student to wait or letting the student know that you want them to wait their turn until you make eye contact with them. A formalized system of feedback can include the provision of tangible objects (e.g., chips or tokens) that the student keeps unless they are impulsive in a manner they are trying to control. A reward is given when they keep one or more of the objects for a specified period of time.
- Many students with impulsivity rush to begin their work before reading or listening to instructions. The student can be asked to read the instructions out loud for classmates or asked to underline all instructions while they are being read. They can also be asked to restate the instructions in order to make sure they were listening. Finally, they can be asked to verbalize a plan of approach before starting work.
- It is common for impulsive students to make careless errors. They should be encouraged to recheck their work, especially math calculations and written work. They can be asked to make a check mark next to each problem as a sign they have checked it. They can also set goals for increasing the accuracy of their work and reduce the number of errors secondary to careless mistakes.
- Response delay techniques can be taught such as asking the student to count to three or five before verbally or physically responding.
- The student can be taught "stop and think" methods as a way to help them determine the most appropriate response.
- Social difficulties are common for children with poor verbal and behavioral inhibition. They would be encouraged to attend to interpersonal spacing and boundaries, to make a conscious effort to listen to others before responding, to resist the tendency to dominate the conversation, and strive to make positive versus negative comments to others. Adults should provide feedback to the student about how their impulsive behaviors impact the quality of interpersonal relationships.

Emotional Control: This refers to the child's ability to maintain emotional control while experiencing both positive and negative affective states. With positive emotions the student may become overly animated and silly. When experiencing negative emotions such as frustration or disappointment the child may become irritable or explosive. Dimensions of frequency, intensity and duration of inappropriate emotional expression are often atypical compared to same age peers. Specific interventions would include the following:
- A discussion about various emotional states and ways to appropriately express these feelings should take place. Providing the student with direct feedback about ways in which their emotional expression affects others would be appropriate and helpful.

- When the student will be entering a situation that challenges emotional control, there should be a preview of what is likely to take place and suggestions about appropriate ways to respond. Following there should be a review of how the student managed their emotions with reinforcement given for positive and effective expression of emotion.
- It is often the case that individuals with poor emotional regulation find it difficult to manage negative affective states (e.g., frustration, disappointment). Formal teaching of coping strategies including behavioral and cognitive interventions would be recommended. Behavioral strategies would include walking away when upset, practicing calming and relaxing behaviors to regain emotional control, and discussing upset feelings once emotional control is re-established. Cognitive interventions include helping the student to become aware of negative thinking patterns such as "I never get to do what I want" or "Things are always unfair." These would be identified and replaced with positive cognitions such as "I did what I wanted yesterday so it is someone else's turn to pick what to do."
- A behavioral intervention plan can also be established providing the individual with a tangible identifier of a positive coping behavior. For example, the individual may be given a token for behaviors such as walking away when angry or using appropriate language to express his anger. These tokens can later be "redeemed" for other rewards.
- For children and adolescents with more significant anger management issues, a plan should be established as to how angry behavior will be managed in a period of upset. Typical interventions include early identification of irritable and angry feelings, disengagement in order that all involved maintain or regain emotional control, and processing what occurred and how the situation can be effectively handled in the future. This processing should be non-threatening and instructive.

Initiate: This dimension of executive functioning relates to the child's ability to begin a task or activity and to independently generate ideas, responses or problem solving strategies. Difficulties in this area can be secondary to other executive functioning issues (e.g., disorganization) or emotional concerns (e.g., anxiety). As a result, observation and discussion with the student is important in tailoring intervention strategies that will be most effective. Possible strategies include:
- Build in routines for everyday activities such that the initiation and completion of tasks become automatic. For example, the morning routine can be broken down into a sequence of steps and these steps can be written on a list or index cards to be followed.
- External prompting such as touching the student's desk or providing a verbal cue to begin a task may be necessary. Also, there may need to be a review of what is to be accomplished within a given work time. Breaking down a large task into smaller, more structure steps can be helpful. For example, during independent seat work the teacher should stop by the student's desk, review expectations for work completion, and set a goal for the student to finish a certain amount of work within a given period of time. The teacher would then stop back at the desk to determine whether the student was able to initiate and complete the work agreed upon. This same approach can be utilized by a parent each night for homework completion.
- The use of a timer may be helpful to the student to begin and persist on a task.

- Peers can also be helpful to cue a student with initiation problems to begin work.
- Adults should be aware of those tasks that may be most challenging for the student and correspondingly be more active in facilitating the initiation and follow through on these tasks.
- Students with initiation difficulties may benefit from learning a structured, systematic approach to idea generation. These can include brainstorming, webbing, and the use of graphic organizers.

Plan/Organize: This refers to the student's ability to manage current and future-oriented tasks. Planning refers to the ability to anticipate future events, to set goals, and to develop appropriate sequential steps ahead of time in order to carry out a task or activity. Organize refers to the ability to bring order to information and to appreciate main ideas and key concepts when learning or communicating ideas. It also relates to the organization of materials and time. Planning interventions include the following:
- Highlight to the student that one can develop a plan of how to most efficiently and effectively complete a certain task. Discuss with them a plan of how to go about the completion of various common tasks. The student should be encouraged to ask themselves various questions such as "How did I do the task?", "Did the way I did it work?", and "Is there a better way to do this the next time?"
- The student may benefit from a "cookbook" of steps for common or routine tasks such as studying for spelling tests, competing writing and long term projects, and gathering information from textbooks for future assessment of knowledge.
- Students with planning difficulties would benefit from increasing awareness of upcoming expectations and activities. This can be accomplished by reviewing expectations at the beginning of the week as well as at the beginning of each day. Adults can help facilitate the development of a plan of how to meet various expectations in the most effective and efficient manner. Built into these discussions should be ways to prioritize task completion and monitor progress.
- For long term projects the student should be encouraged to develop a time line for completion of the various components required. It may be helpful if this is placed on a calendar to reinforce awareness for the student.

Organizational interventions include the following:
- Students with executive functioning deficits in the areas of planning and organization often benefit from frequent home-school communication. Depending on the age of the student and the degree of disability, this may be necessary on a daily or weekly basis. Information to be communicated to the home setting would include any missing assignments, future work expectations, average grade, and any particular behaviors of concerns. This can be communicated via a home note system or e-mail transmission.
- The student would be encouraged to learn and utilize a system for recording assignments to be completed. This could be an assignment notebook or electronic recording device. In the initial stages of using this instrument the student should be checked by parents and teachers to determine whether they are using it in the correct manner.

- The student would be encouraged to make decisions throughout the day as to what materials need to be taken home for work completion and which can remain at school. They would be encouraged to develop a way to physically set aside these materials in their classroom, a book bag or in a section of the locker as the day goes on.
- The student may need extra organization time at the outset or end of the day in order to prepare for the day or gather materials necessary to take home for work completion.
- For younger or more severely disabled students they may require an extra set of books at home to provide ready access to those materials necessary for work completion.
- If available, the student should check the homework hotline to make sure they have completed all work. They would also be encouraged to identify several peers within their classroom that they could contact if necessary when uncertain about homework expectations.
- The student should develop a personal organizational system which includes a daily planner/assignment notebook, folders/notebooks for record keeping and a book bag to transport materials to and from school.
- A specific homework folder is often helpful to the student. This folder is to be used for all homework such that the student always knows where to look when needing to turn in work. This folder can also be used to transport completed work and tests home for the parents to review with the student.
- Essential information can be written or typed and placed in the front of the daily planner for easy access. This might include important phone numbers, locker combinations, and overall schedule.
- The accumulation of unnecessary papers and materials is often an issue for students with organizational and planning problems. An adult should help the student identify what materials are necessary to keep and where they should be put. Periodic cleaning of the student's locker and/or desk at school and room and work space at home would be recommended.

Working Memory: This refers to the student's capacity to hold information in mind for the purpose of completing a task, encoding information, or generating goals, plans, and sequential steps to achieving goals. Working memory is essential to carry out multi-step activities, complete mental manipulations such as mental arithmetic or fluid written language projects, and follow multi-step instructions. This deficit can affect many aspects of functioning at home and school and interventions can include the following:
- Establish eye contact prior to giving important instruction to the student.
- Present information at a slower rate or repeat it as necessary.
- Write multi-step directions out for the student and encourage the student to develop the habit of writing down important information for future reference.
- Ask the student to restate the directions as necessary.
- Pre-teach the general framework of new information highlighting the most important aspects to be attended to. Providing an outline prior to giving a lecture or a rubric to follow for assignments can be helpful.

- Provide "attentional breaks" when activities require sustained and intense working memory abilities. These can include brief motor breaks where the student is allowed to move around, get a drink, etc.
- Balancing the amount of time on any one task, especially if it is demanding on working memory skills can be helpful. Extended work periods demanding working memory skills can lead to significant cognitive fatigue and increased off-task behavior.
- Individuals with working memory deficits often experience information retrieval delays. This leads to a slower rate of cognitive processing. Provision of extended time for assessments would be appropriate if these processing speed delays are noted. Also, the elimination of certain types of assessments that primarily demand speed of task completion as a measure of competency would be appropriate. For example, the assessment of knowledge of math facts through a timed assessment (e.g., mad minute) would not be recommended for students with working memory and processing speed issues.
- Given related processing speed and fluency issues, there may be the need to reduce the amount of homework assigned to the student.
- Accurate assessment of the student's knowledge may also be more accurate when utilizing recognition (e.g., multiple choice) versus recall (e.g., fill-in-the-blank or essay) formats.
- Utilization of "self-talk" by the student in order to guide themselves through a multi-step task or problem can be helpful.
- Students often demonstrate difficulties keeping track of more than one to two steps at a time. Providing a written checklist of steps required to complete a task or problem can serve as an external memory support. Academic tasks that may benefit from this type of intervention could include completion of long division problems, balancing chemical equations and organizing and completing a long-term paper or project.
- Written language tasks are often affected by poor working memory skills to the extent that the student is required to attend to idea generation, thought organization and sequencing, sentence structure, punctuation and spelling in a simultaneous and fluent manner. Students would be encouraged to break down the written work into several smaller steps attending to each aspect separately. Use of word processing technology can be helpful to facilitate fluent work correction and completion.

Monitor: Monitoring behavior is necessary both for tasks as well as interpersonal behavior. Task-oriented monitoring or work-checking habits refer to the student's ability to assess their own performance during or shortly after finishing a task to ensure accurate and appropriate completion. Self-monitoring of interpersonal behaviors involves the student keeping track of the effect that their behavior has on others. Poor inhibition abilities typically exacerbate challenges in this area of functioning. Specific interventions include the following:
- Build in a review and edit procedure for each task completed. This should involve setting aside time to attend to this aspect of task completion and asking the student to signify that they have reviewed work by making a check mark or double underline on reviewed responses.

- Set goals for the student for accuracy rather than speed of work completion.
- Students with weak monitoring abilities often demonstrate poor awareness of time. Specific efforts should be made to help the student become more aware of their productivity which is defined as how much work they complete within a given time. One such intervention can include asking the student to predict how much work they will accomplish within a specified period of time, allow them to work for that time period, and assess the accuracy of their prediction.
- Students should be encouraged to utilize external cues such as the clock, a timer, or the progress of peers to help assess the need to adjust their speed of task completion.
- In the area of interpersonal behavior, adults working with the student should provide instructive feedback based on their own experience working with the student (e.g., "When you talk to me you stand too close"). In conjunction with this feedback, the student should be taught the verbal and nonverbal behaviors that others demonstrate relating to positive and negative interpersonal behavior that they can attend to in order to assess their impact on others.
- Adults should observe the interpersonal behavior of the student with peers and provide feedback as to appropriate and inappropriate behaviors demonstrated. Feedback should also be provided regarding the verbal and nonverbal behaviors of peers that provided information as to how the student could have modified their interaction pattern (e.g., "I noticed when you rushed into to the room and spoke loudly in Ben's ear he turned away and went to talk to someone else").
- Participation in a structured social skills group that can pay particular attention to these behavior patterns and possibly videotaping the interactions for further review can be helpful.

GOAL-PLAN-DO-REVIEW

GOAL
What do I want to accomplish?

PLAN
How will I accomplish my goal?

MATERIAL/EQUIPMENT	STEPS/ASSIGNMENTS
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

PREDICTION
How well will I do? How much will I get done? How long will it take?
(Rating on overall predicted performance, 10 being highly effective & efficient)

Self-rating   1   2   3   4   5   6   7   8   9   10

Other-rating 1   2   3   4   5   6   7   8   9   10

DO

PROBLEMS WHICH DEVELOPED	DEVISED SOLUTIONS
1.	1.
2.	2.
3.	3.

REVIEW
How did I do?

Self-rating   1   2   3   4   5   6   7   8   9   10

Other-rating 1   2   3   4   5   6   7   8   9   10

What worked?	What did not work?
1.	1.
2.	2.
3.	3.

What will I do different the next time?