

Executive Functioning: What is it?

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SCOTTISH RITE



Objectives

What is it?

How does it relate to spina bifida

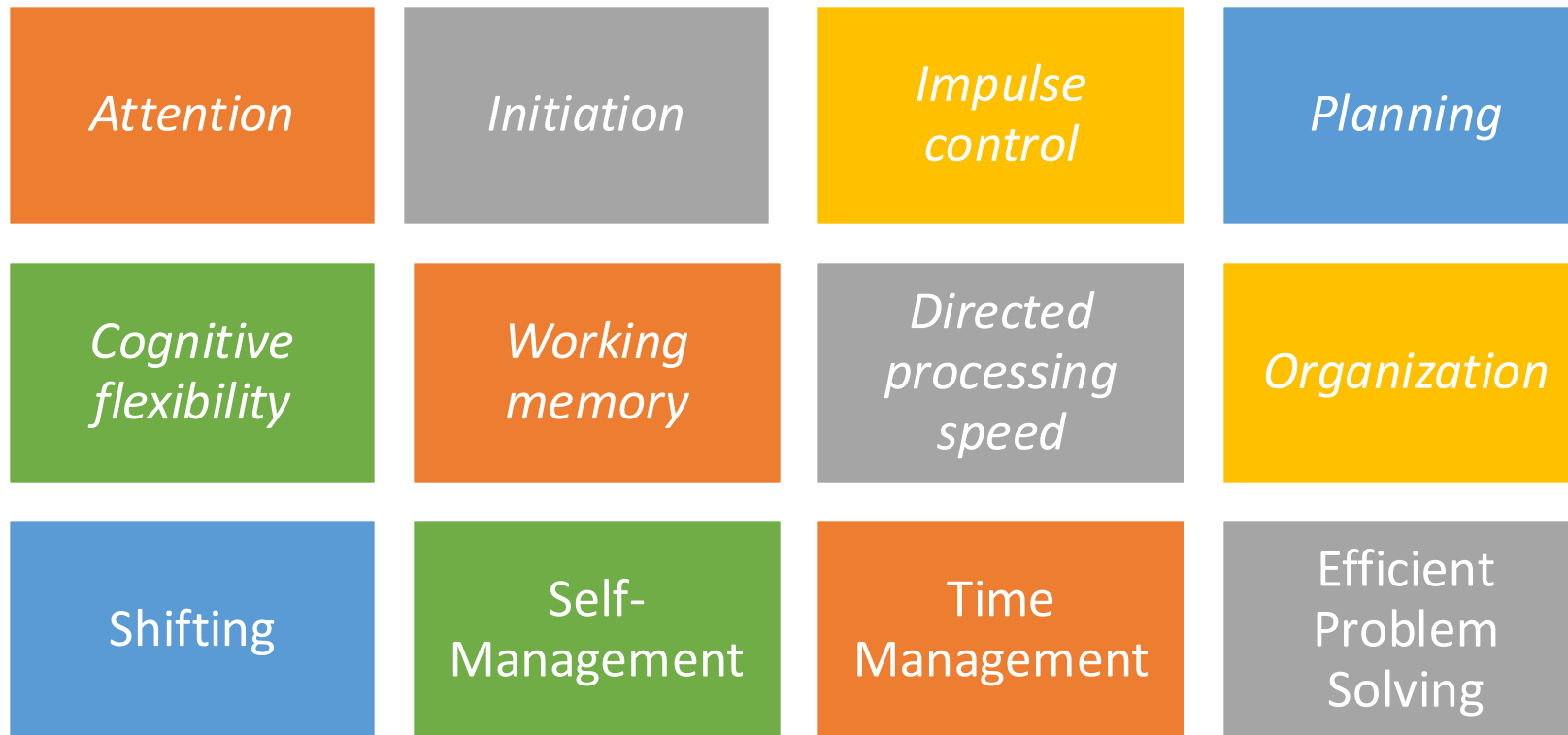
How to Intervene

Alternative ways to support



What is Executive Functioning

- Higher order cognitive control processes that enable goal-directed behavior, self-regulation, and adaptive functioning.



The Secretary of the Brain



Taking calls



Labeling/Organizing Files



Staying calm



Taking notes



Prioritizing Tasks

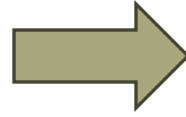


Scheduling





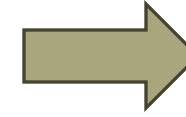
Taking calls



Attention



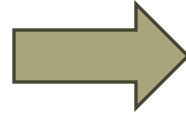
Labeling/Organizing Files



Memory



Staying calm



Emotional Regulation



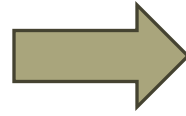
Taking notes



Getting all the information;
Determining what is important



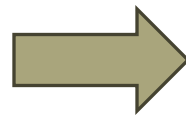
Prioritizing Tasks



Where to start; what should you do first



Scheduling



Planning/Organization



Executive Functioning (EF) and Spina Bifida (SB)



Neurocognitive Profile

Individuals with myelomeningocele (spina bifida) can often have difficulties in

- Visual reasoning/problem-solving
- Word retrieval and fluency
- Memory retrieval and visual memory
- Abstract Verbal Language
- **Attention**
- **Executive Functioning**
- Motor functioning and Fine motor dexterity
- Academic problems in mathematics, reading comprehension, and written expression



Executive Functioning and Spina Bifida

- MMC have increased likelihood of EF challenges compared to other variations of SB
- Other brain abnormalities to consider
 - Hydrocephalus
 - Chiari II malformation
 - Corpus callosum abnormalities
 - Lesion level
 - Seizures

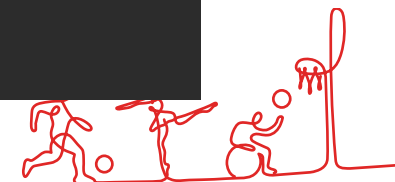
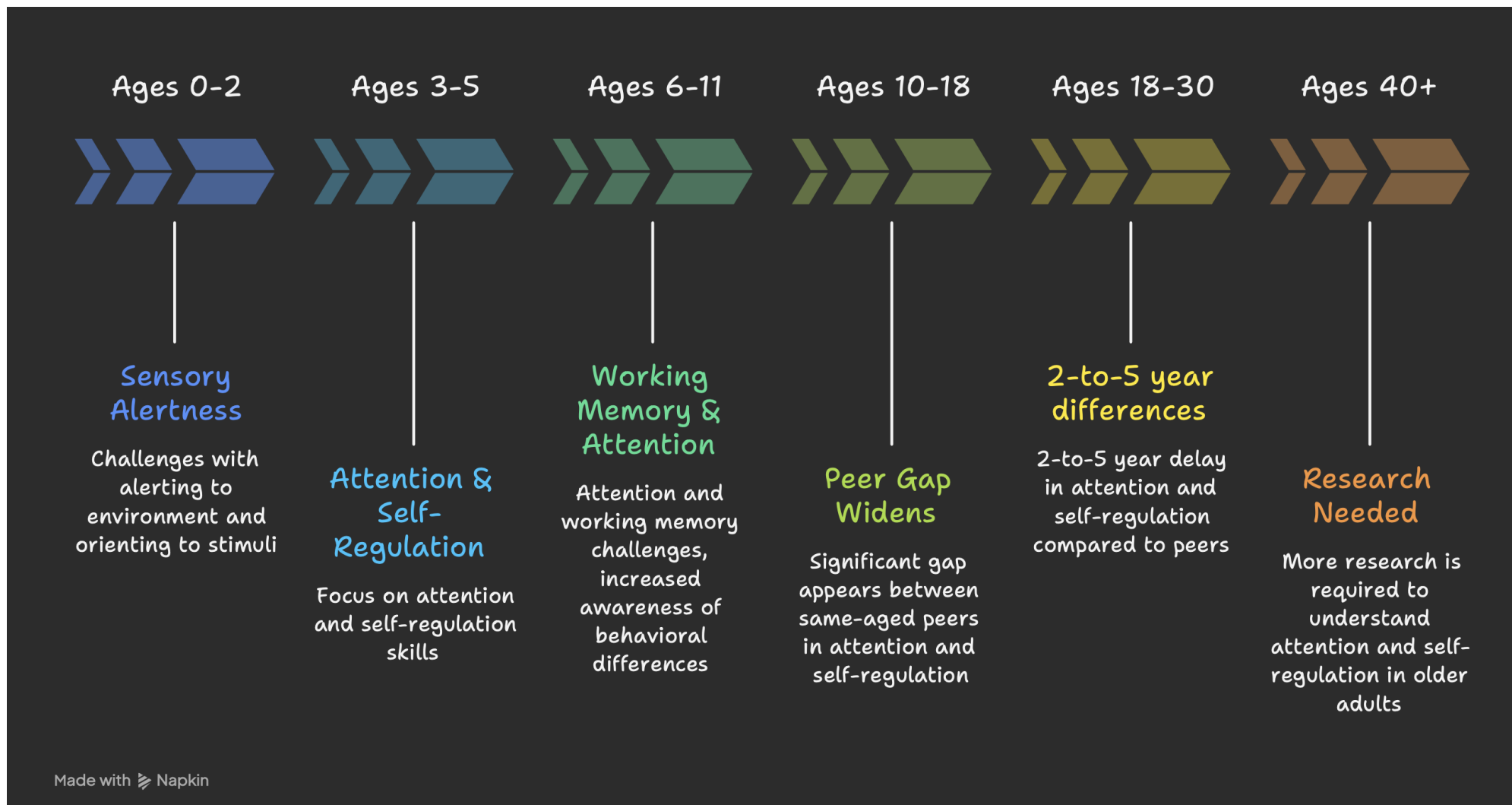
Ogut, 2025



Executive Functioning and Spina Bifida

- Common EF challenges for myelomeningocele:
 - Working memory
 - Inhibition
 - Cognitive flexibility (Shifting)
 - Sustained attention
- Challenges with EF are found even when IQ is controlled for
 - Increased challenges with
 - # of shunt revisions (inattention/working memory)
 - Higher lesion level (inhibition)

Development of EF



Other Factors to Consider

- Bullying
- Family Dynamic
- Adverse childhood experiences
- Adjustment to disability/Medical Responsibility
- Mental Health
 - **Anxiety:**
 - Challenges with shifting/flexibility
 - **Depression:**
 - Executive dysfunction is pathway through which leads those with SB to experience internalizing symptoms (Kelly et al, 2012)
 - Inhibition, initiation, shifting, working memory



Common Diagnoses

ADHD

Autism Spectrum Disorder

Anxiety

Depression

Neurodevelopmental disorder/Neurocognitive Disorder

Obsessive Compulsive Disorder

Learning Difficulties

Adverse Experiences



SOCIALIZATION



ACADEMIC



DAILY LIVING SKILLS



EMOTIONAL
REGULATION



GENERAL WAYS TO
SUPPORT EXECUTIVE
FUNCTIONS

How Does Executive Functioning Impact Various Domains of Life



General Considerations for Intervention

- Medication
- Screening/Monitoring
- Neuropsychological Evaluation
- Individualized
- Trial and Error
- Patience and Understanding



Socialization

Skills	Application
Attention	Listen to conversations; Attend to social cues
Impulse Control	Interruptions; Comments that are out of context
Cognitive Rigidity	Perspective Taking; Non-literal language
Verbal Fluency/Processing Speed	Quickly processing conversation
Organization/Attention	Following one's own thoughts



Interventions for Socialization Skills

- Identify the breakdown/area of challenge
- Social skills supports (school or outpatient)
- Explicit instructions/directions
- Group social skills
- Young children: support early play, modeling
- Camps/Extracurricular activities
- Peer role models



Academics

Skill	Application
Attention	Listening to instructions
Initiation	Starting academic tasks
Cognitive Rigidity	Perspective taking; Inferences; Reading comprehension
Shifting	Going from notes to instructor to notes
Organization/Attention	Prioritizing tasks/Assignments/Losing items



Interventions for Academics

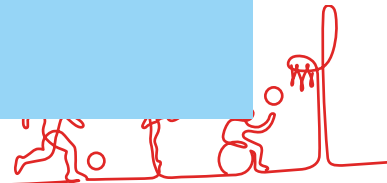
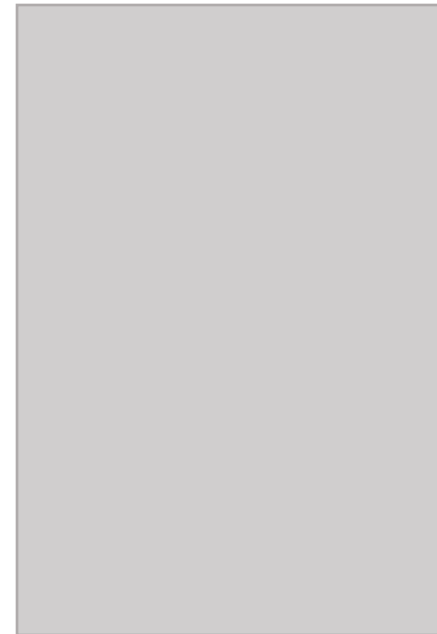
- Identify the breakdown/area of challenge
- Considerations for special education supports or a Section 504 plan
 - Access to modifications and/or accommodations
 - Access to evidence-based interventions to support a specific area
 - Access to small group instructions
- Chunking assignments
- Extra time/Quiet distraction free environment
- Self-monitoring
- List/Reference sheets
- Notes ahead of time



Tasks of Daily Living

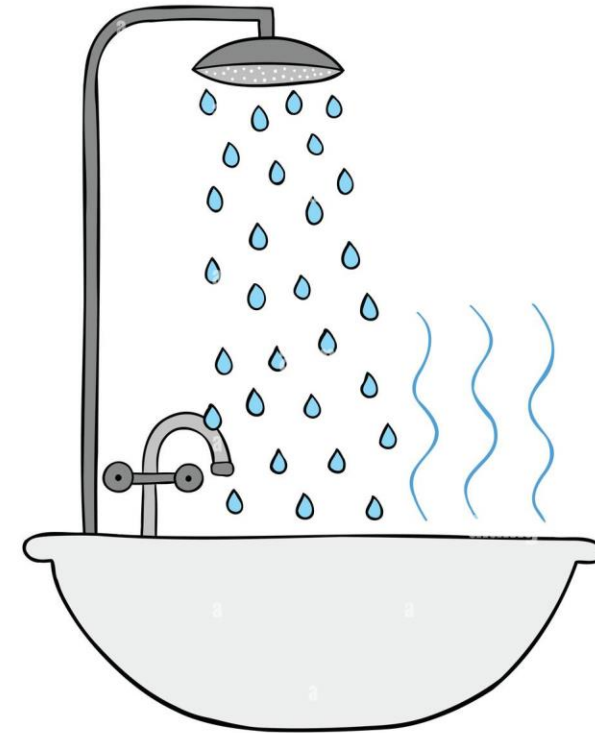
- **Showering**
- Brushing Teeth
- Using Deodorant
- Getting ready for school
- **Self Catheterization**
- Taking Medication

Something often missed are the number of steps needed to complete the tasks that require working memory, impulse control, attention, planning, and organization



Showering

1. Prepare Your Shower Space
2. Take clothes off
3. Turn on the Water
4. Wet Your Body/Hair
5. Shampoo Your Hair
6. Rinse Hair
7. Condition Your Hair
8. Rinse Hair
9. Wash Your Body
10. Rinse Off
11. Turn Off the Water
12. Dry Off



Self Catheterization

- EF challenges often seen

- Processing speed*
- Working memory*
- Organization
- Impulse control

1. Wash your hands thoroughly with soap and water.
2. Gather supplies
3. Get into a comfortable position (standing, sitting, or lying down).
4. Open the catheter package without touching the insertion end if possible.
5. Apply lubricant to the first several inches of the catheter if it is not pre-lubricated.
6. Clean the tip of the penis and surrounding area.
7. Hold the penis upward and gently straighten it.
8. Slowly insert the catheter into the urethral opening.
9. Continue advancing the catheter until urine starts to flow.
10. Insert the catheter a little farther to ensure it is fully in the bladder.
11. Allow all urine to drain.
12. Slowly remove the catheter; pause if more urine flows
13. Dispose of or clean the catheter as instructed by your healthcare provider.
14. Wash your hands again

Interventions for Daily Living Skills

- Identify the breakdown/area of challenge
- Self CIC
 - Introduction to the process early
 - Integrate multimodal instructions (verbal + hands on)
 - Set a timer/Schedule
 - Visual step-by-step checklists
 - Video modeling
 - Support the organization of material
 - Caregiver check-ins
 - Engagement (initiation/motivation)
 - Control



Emotional Regulation/Mental Health

- Often see challenges with
 - Impulse control
 - Shifting
 - Working memory
- Does treating anxiety/depression help with EF?
- Considerations
 - Adjustment to disability
 - Anxiety
 - Depression
 - Suicidal Ideation

Interventions

Cognitive Behavioral Therapy

Psychoeducational Psychotherapy

Zones of Regulation

Mindfulness-Based Approaches

Family Supports and Interventions

SB Camps/Peers Supports

Considerations for Education Supports

Sciscent, et al., 2023



Alternative/Additional Supports

- Physical Activity (inhibition; Xue et al., 2019, Lui et al., 2025)
- Mindfulness (Bigelow et al., 2021)
- Computerized Training
 - Needs more research and not as promising for neurodiverse children
- Play-Based Games
 - Simon Says, Red/Light Green light, Musical Freeze
 - Improvement in language, motor, and EF for preschoolers (Gibbs et al., 2021)
 - Board and Card games
- Cooking
- Modeling activities
- Practice/Repetition
- Group activities



Alternative/Additional Supports

Therapies/Formalized interventions

- Cognitive Behavioral Therapy
 - Group vs Individualized (Liu et al., 2026)
- Executive Function Coaching/Organizational Skills Training
- Occupational Therapy (day-to-day functioning)
- Acceptance and Commitment Therapy (ACT)
- Dialectic Behavioral Therapy (DBT)
- Parent Mediated training
- Special Education/Section 504 plan



Alternative/Additional Supports

- Address Concerns/Other Considerations
 - Sleep
 - Screen time
 - Social determinants of health
 - Other medical differences (shunt, renal differences, etc.)
- Understanding what a skills deficit vs performance deficit



In Summary

- Higher likelihood of executive dysfunction
 - Consider the complexity of their medical history
 - Intersectionality of other neurocognitive differences (motor, visual spatial)
- Executive functions are involved in every domain of life
- Important to identify the break down
- Model kindness and understanding
- Interventions can be trial-and-error



Questions?

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