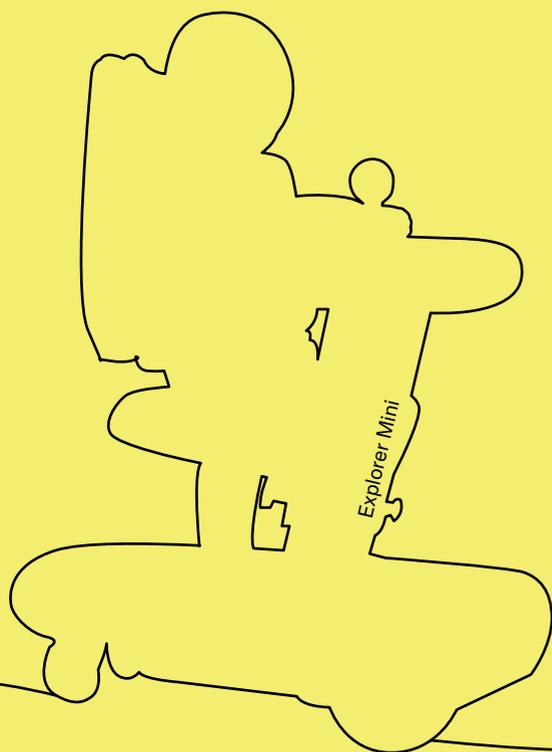


A CLINICIAN'S GUIDE TO THE

Explorer Mini



Date: June 2022

Information within this document has been adapted from “A Guideline for Introducing Powered Mobility to Infants and Toddlers” by Heather Feldner, PhD, PT, PCS, Teresa Plummer, PhD, OTR/L, CAPS, CEAS, ATP, and Alyson Hendry, M.A., CCC-SLP, which was completed in January 2022. This guideline is an interdisciplinary resource developed through a literature review, evidence appraisal and synthesis of existing tools. A global consensus was gained based on input from 40 subject matter experts including Occupational Therapists, Physical Therapists, Speech Language Pathologists and Caregivers.

For access to the complete document, “A Guideline for Introducing Powered Mobility to Infants and Toddlers”: <https://www.permobil.com/clinical-research>

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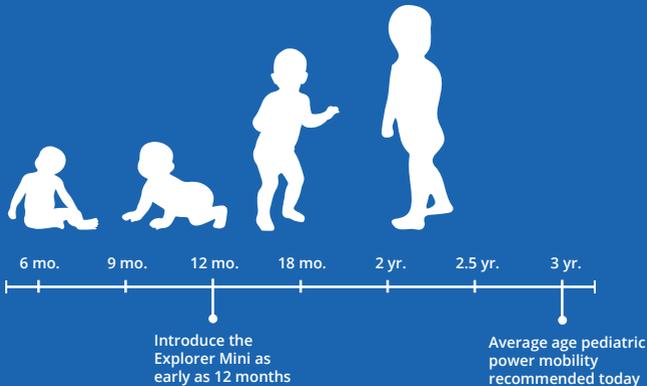
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On-time mobility

Critical changes occur during development when a child has the ability to move about their environment in a self-directed way, without having to rely solely on others to experience their world. This self-directed mobility has been shown to have a positive impact on development in a variety of areas including cognition, visual, language, social, motor, and psychological skills¹⁻⁸.



“ On-time mobility is a newly proposed framework that highlights principles of timing urgency, frequency, sociability and multi-modal mobility to facilitate the right to active mobility to explore, engage in relationships and develop agency to co-create their lives⁹. ”



“ Mobility at an early stage in life aids in the development of functional activities including play¹⁰⁻¹². ”



Implications for clinical practice

Power mobility should be included as part of comprehensive early intervention programs to prevent or minimize the impacts of immobility on development¹³. Keep in mind that an infant or toddler may use a power mobility device part-time, or full-time or anytime.

Increasing clinical knowledge about power mobility devices allows a clinician to provide individualized knowledge, training, support, and strategies to caregivers allowing these devices to be incorporated into everyday routines¹⁴.

Powered mobility device use has been demonstrated in children as young as 7 months old. Recent research and expert opinion has indicated that clinicians should move away from focusing on “readiness” for powered mobility. Instead, literature in the field now recommends that clinicians should provide early opportunities for augmenting mobility with technology to facilitate development across multiple domains, which may subsequently promote the emergence of new abilities¹⁴.

ON-TIME MOBILITY



Designed with purpose



The Explorer Mini is a solution designed to provide on-time mobility, weight bearing, and postural development for young children ages 12-36 months. It has been designed with the child in mind, so they can gain experience through movement with age-appropriate supervision.*

It is intentionally designed to be lightweight and simple to transport, but with a playful look that allows a toddler to explore a variety of settings with ease.

The Explorer Mini is the only Class II medical device that has achieved FDA regulatory clearance for this age group. A physician's prescription may be required for evaluation and use, please consult your local regulations. It is also a CE-marked Class I medical device with documented supportive clinical evidence.

*See User's Manual for complete device instructions.

Permobil collaborated with leading experts and researchers to develop and test the Explorer Mini. The researchers found that toddlers who used the Explorer Mini:

- Experienced positive responses in behavior and socialization including increased emotional responses during therapy (e.g. hugs/kisses) and physical emotions from non-verbal children (e.g. big smiles)
- Would initiate intentional movements including getting unstuck from a corner and using a joystick without caregiver help
- Demonstrated increased responsiveness during use and increased cognitive skills after use¹⁵



94%

of the children moved the device in at least one direction



88%

reached for the joystick when prompted



94%

of children exhibited an emotional response when driving

Developmentally inspired seating

The seating system of the Explorer Mini was designed to promote safe and stable support while allowing opportunities to develop strength, sitting tolerance, and postural control¹⁶⁻²¹.



The uniquely designed saddle seat puts the pelvis in an active position. The seat is also adjustable without tools to accommodate growth or modulate lower extremity weight bearing.⁶



While the saddle seat can be adjusted in height, it is also removable to allow the child to sit or stand. This creates opportunity to develop strength, standing tolerance and postural control.^{6,20}

DESIGNED WITH PURPOSE



Developmentally inspired seating



Integrated seating system

To complete the activity-inspired seating system, the adjustable height tray provides a place for upper extremity weight bearing while having an integrated back support. This design helps to improve strength, endurance and postural control while supporting typical, everyday movements.

Maximize early learning



A bright, appealing joystick attracts the attention of most toddlers, even those with visual impairments. The rounded yellow joystick is ideal to promote development of grasp and release ^{21,22}.

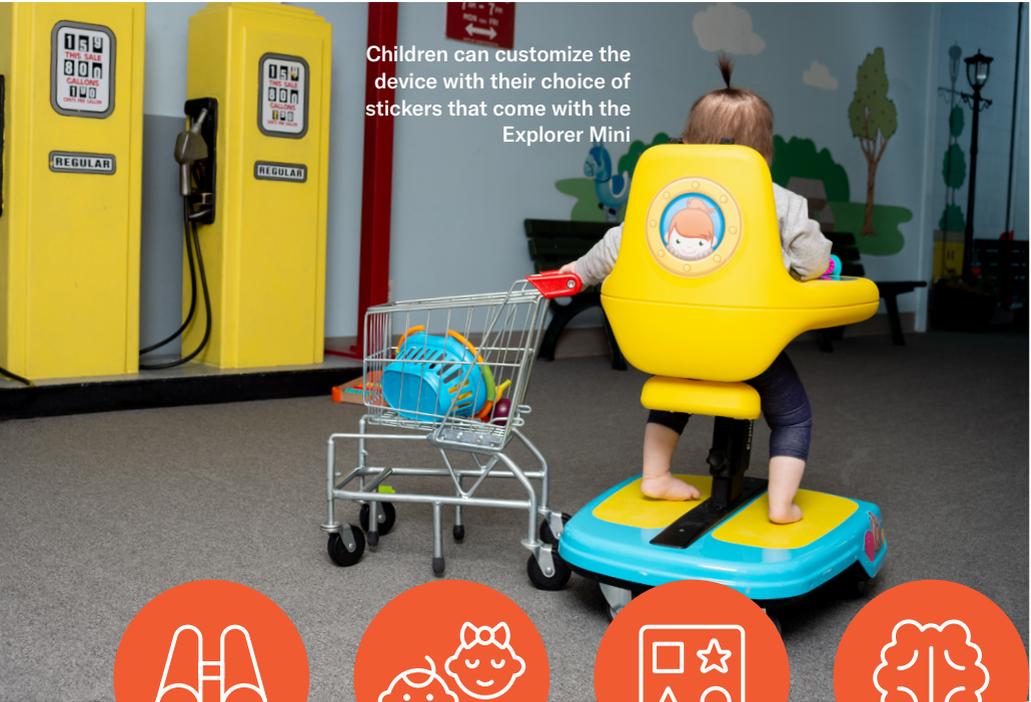
The position of the joystick allows children to use both hands together in a midline position. This motor skill, along with crossing midline, is a critical component of functional tasks such as putting on socks and shoes ^{21, 22}.

The use of a proportional joystick provides direction-specific movement for motor and sensory development ^{15, 21, 22}.



Independence through exploration

The Explorer Mini provides toddlers the opportunity to explore their surroundings in an upright and engaged position. Power mobility may facilitate independence in exploration which can lead to a positive impact on development, both physically and psychologically²³.



Freedom to explore



Increased socialization



Age-appropriate play



Develop visual & attention skills

Exploration made easy



Lightweight so that 1-2 people can easily transport it in a van or SUV



Everything comes in one box, fully assembled!



Soft, rubber surface with built-in hand hold locations, and easy to wipe clean



Designed with no loose or small parts and with a removable and washable cover

“ Both evidence and stakeholder consensus indicate that device design and operation are also critical aspects of a collaborative partner approach, in that devices must be simple and easy to use for both children and caregivers¹⁴. ”

– Feldner, Plummer, & Hendry, 2022

Clinical considerations

Is a specific diagnosis required?

- There is no specific diagnosis needed or required, any child with limited mobility could be considered
- Together with the child's family and medical team you will decide if the device is appropriate based on functional goals
- The Explorer Mini can be utilized for any child who is not yet mobile on their own, whether they are expected to be ambulatory in the future or not
- The Explorer Mini is designed for children ages 12-36 months, 35 lb/16 kg or less, and 39 inches/100 cm or less

What basic skills does a child need?

Joystick access

Typically accessed using one or both hands, but sometimes a child will use their head, nose, or even mouth

Head control

Able to safely manage head while in the device

Trunk control

Developing control with posture while stationary and when moving

Vision considerations

There are no requirements related to vision

There are emerging abilities that may be advantageous to address alongside of powered mobility. These may include¹⁴:

- **Shared attention:** increasing awareness of responses such as getting attention of another person or from the device itself
- **Visual fixation:** practice maintaining a stable visual field
- **Trunk and upper extremity control:** Explorer Mini can be used in a sitting, semi-standing, or standing position, trunk control can also be practiced in real-time while using the device
- **Head control:** practicing the ability to regain head control in multiple directions
- **Use of the joystick:** using various techniques to activate and control the joystick as the hands become more efficient and accurate
- **Social-emotional and communication development:** recognition of the range of emotions the child may be expressing both verbal and non-verbal

“ There is no expectation of pre-existing abilities, rather, abilities emerge through interaction, trial and error, and guidance.”

– Feldner, Plummer, & Hendry, 2022

Safety considerations

It is essential that clinicians and caregivers who are using the Explorer Mini or any other powered mobility device have reviewed the device-specific User's Manual in detail prior to any use of the device.



Here are some additional safety considerations¹⁴:

- Ensure the device is charged and in working order BEFORE training
- Clean device especially if used in clinic setting
- It is important for child to feel safe
- Provide close adult supervision at all times
- While free exploration is desirable, if adults do need to intervene they should do so calmly
- Examine and modify the environment to minimize injury such as table corners

When and where to intervene?

- Allow the child to safely “bump” and engage with fixed items in their environment to learn cause and effect and problem solving
- Expert consensus indicated caregivers and clinicians should intervene immediately to remedy issues with posture, positioning, or the environment
- HOWEVER, evidence suggests that a delayed response (within the limits of safety) may present an opportunity for learning, self-adjustment by the child, or mastery motivation

“ It is important that the adults permit the child ample space and freedom to explore and practice independently (within the limits of safety). ”

– Feldner, Plummer, & Hendry, 2022

Frequency and duration of use

How often and for how long should a child use the Explorer Mini?



Dosage is related to the duration of time or frequency, as well as the number of sessions over time.



Consider child's (and caregiver's) individual abilities, endurance, and motivation.



May change over time depending upon health status, resources, and environment.



Additional literature and expert consensus indicate it is important to encourage frequent and flexible opportunities to use the device and ample repetition during intervention.



There are no specific recommendations for dosage for powered mobility use in the literature, in part because this is dependent on the highly individualized needs and goals of children and caregivers.



– Feldner, Plummer, & Hendry, 2022

FREQUENCY AND DURATION OF USE



Communication and language

There is a proven link between early motor development and early language development. Including a speech language pathologist in the early intervention power mobility team allows an opportunity to explore these changes across multiple domains. Consulting with speech language pathologists when introducing powered mobility across all learning stages can have the following benefits¹⁴:

- Identify speech and language disorders that often accompany conditions that impact mobility development
- Evaluate receptive language to tailor verbal or auditory cues based on a child's current communication skills
- Facilitate communication with children who are pre-verbal or non-verbal
- Increase understanding of receptive and social-emotional abilities during the powered mobility intervention
- Provide awareness to and create responses for verbal and non-verbal communication to promote social interaction during exploration
- Creates opportunity to support communication in and out of the device



Team-based learning and problem-solving strategies developed in collaboration have been shown to have a higher likelihood of use and implementation throughout a typical day by caregivers and children.

– Feldner, Plummer, & Hendry, 2022

Strategies for connecting motor and language development¹⁴

- Use simple and consistent language
- Focus on comments and statements compared to questions when a child is an early learner
- Use single syllable words when possible during the developmental learning stage
- Utilize the “right label at the right time” so that when a child physically engages with an item, provide a label or action to teach expressive language. If a child moves the joystick, clinicians can verbalize “you are moving the joystick”
- Adapt as needed by providing verbal labeling, using a sign or with augmentative communication

Strategies to increase engagement and provide a language-rich environment¹⁴

- Sit face-to-face with the child
- Observe the child; wait and look at them expectantly; listen carefully and acknowledge any words or sounds they make
- Create opportunities for the child to initiate communication
- Follow the child’s lead in play; join them where they are
- Imitate the child’s noises, words, and facial expressions
- Interpret what you think the child is trying to tell you with their words, sounds, and actions
- Comment on what the child is doing. Use short phrases to describe what they are doing

Learning to use powered mobility

Preparatory considerations

General environment:

By allowing the child to become more familiar with the device in their own environment, they will feel more comfortable when learning to move.

Things to consider:

- Learning may not occur immediately
- The goal is to create a positive experience
- The interaction should be child led in ways that are developmentally appropriate
- Determine what the motivators are for each child

“Preparation is essential for psychological safety to acknowledge and ease any fears the child has of the device and create a smooth transition.”

– Feldner, Plummer, & Hendry, 2022

“ Early powered mobility provides opportunities for language development. Receptive language helps a child learn to use the device, while expressive language combined with mobility allows a child opportunities to engage, interact, and participate more fully in their environment. ”

– Feldner, Plummer, & Hendry, 2022



Field and Livingstone have described three different groups of powered mobility learners based on current abilities, support recommended, learning environments, and example practice strategies.

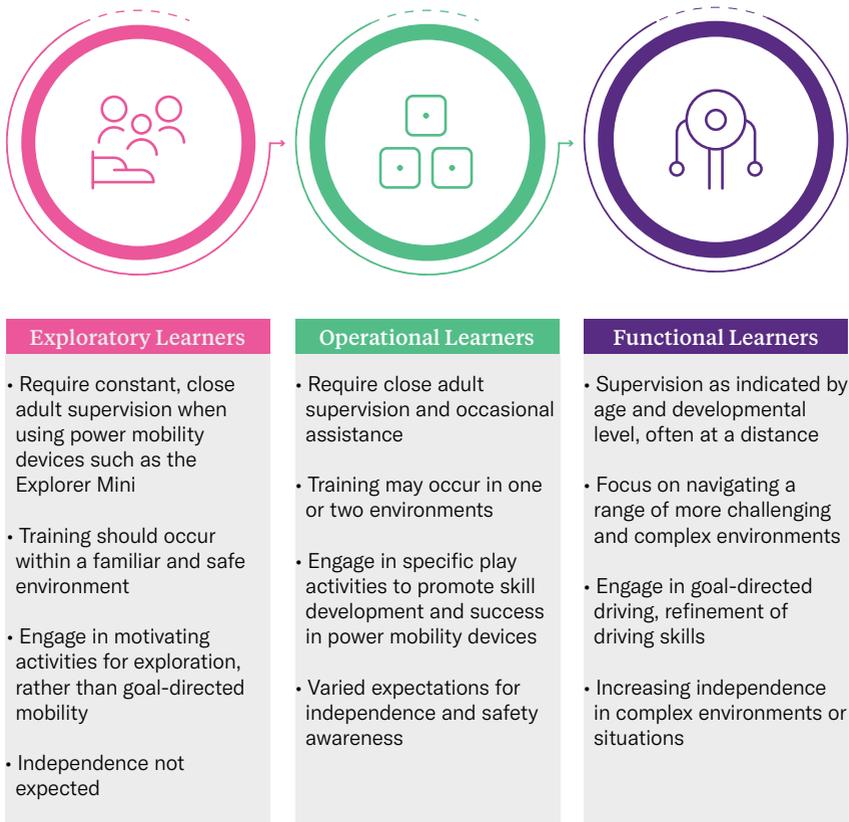


Figure 1. Field and Livingstone's (Exploratory, Operational, and Functional Learner Groups)



Helpful tip

Think about what stage of learning a child is in, rather than if a child is "ready" for powered mobility.

LEARNING TO USE POWERED MOBILITY

Nilsson and Durkin's Assessment of Learning Powered Mobility Use v. 2.0 (ALP) combines eight learner phases nested within three learning stages providing descriptors of example behaviors during the powered mobility learning process.

The assessment tool is paired with a series of facilitating strategies to encourage learning, enhance facilitator and child communication and responses, and engage in informed decision-making about driving environments. The ALP is summarized in the following pages, but the complete tool and facilitating strategy document is available at www.lisbethnilsson.se. Fluctuation between phases is common during learning and is based on a child's alertness or fatigue, attention, and motivation²².

Phase and stage descriptor detail ensures that small changes in learning are recognized and celebrated, helping to maintain child and caregiver motivation. Keep in mind that not all children will achieve an expert phase, but that doesn't eliminate them from using powered mobility.



Stage 1: Explore Function



1

Phase 1: Novice

- May be distractable, anxious, or have no response to interaction or guided mobility
- May explore the joystick or device, may have accidental activation but no intentional movement, may want to get out of device
- Limited understanding of cause and effect relationship of the joystick to movement
- May be happy, neutral, or may be upset/crying. May be aware of attention from others or have no response

2

Phase 2: Curious Novice

- May be alert or more passive at times, focused, single point of attention
- May touch or bang various parts of the device in between quiet sitting, may touch or hit switch or joystick to experiment
- Basic connection established between touching the joystick and causing movement
- May be curious, anxious, upset or content. Will respond to interaction and may mirror behavior or jointly focus on activity

3

Phase 3: Beginner

- Alert, focused on a single point of attention but able to shift attention
- Targeted joystick movement to attain movement, applying adequate force and able to press switch or joystick
- Basic understanding that joystick movement causes device movement, may drive in circles or try to use body to move device
- May be serious or concentrating, contented or smiling, interacts using eye contact and facial expressions

Figure 2. Adapted from Nilsson & Durkin's Assessment of Learning Powered Mobility Use Phases and Stages.

Stage 2: Explore Sequencing



4

Phase 4: Advanced Beginner

- Attentive but can shift attention spontaneously
- Intentional exploration of joystick and its functions for movement, movements may be cautious or careful
- Aware of movement in different directions, exploring cause and effect of joystick activation or multiple switches in different ways
- Shows desire to explore environment, may smile and laugh or be serious, engages peer or adult in exploration

5

Phase 5: Sophisticated Beginner

- Attention focused on two different points, focused and active
- Exploring and experimenting with device and directional movements, may be more eager or aggressive with joystick
- Understands different effects of joystick moving in different directions, understands add-on guidance systems if applied
- May show frustration or eagerness and smiling given developing abilities. May show reciprocal interaction with people and environment

Figure 2. Adapted from Nilsson & Durkin's Assessment of Learning Powered Mobility Use Phases and Stages.

INTRODUCING POWERED MOBILITY



Stage 3: Explore Performance



6

Phase 6: Competent

- Focused on goal-directed driving, may have attention focused on multiple points but easily distracted
- Driving/steering skills emerging, thus concentrating on point to point mobility and may ignore people or environment
- Conscious understanding of steps needed to reach goal, controlled but not refined joystick use, may try to use body to move device
- May be serious, content, or smiling and laughing, will interact with device or others but not both at the same time

7

Phase 7: Proficient

- May divide attention between multiple points and improved focus
- Refining control and timing of joystick control, drives for pleasure and learning to navigate within environments
- Conscious understanding of joystick control, refining navigation skills toward fluency and can manage themselves within device
- Signs of happiness and satisfaction prevalent, and displays capability of interacting with people and environment simultaneously in social play

8

Phase 8: Expert

- Can maintain attention to multiple points and shows relaxed and active engagement
- Demonstrates fluid and automatic movements, driving is no longer the task but rather the means to participate in other tasks or activities
- Driving is mostly subconscious and precise, uncertain spaces are navigated independently and intuitively, can attend to others while driving
- Expression contingent on the outside activities being conducted, not on driving itself, able to interact on multiple levels without interruption

Figure 2. Adapted from Nilsson & Durkin's Assessment of Learning Powered Mobility Use Phases and Stages.

Intervention techniques

The remainder of this guide is representative of the section within “A Guideline for Introducing Powered Mobility to Infants and Toddlers” by Feldner, Plummer and Hendry. The summary of intervention techniques comes from seminal work published in the field of pediatric physical therapy, as well as broader theory and empirical studies across multiple disciplines.

The intention of the evidence-based guideline is to:

- Support access to mobility as part of a multi-modal early intervention
- Help ensure continued development of best practice and evidence to support shared decision making
- Provide reproducible, repetitive, and reliable training guidelines to facilitate learning across contexts
- Be used in conjunction with existing and emerging powered mobility outcomes measures to determine intervention effectiveness
- Allow for future grant-funded research and multi-site studies to maximize self-initiated mobility and exploration outcomes for young children with disabilities



Helpful tip

When reviewing these intervention techniques, remember that there is “no single, optimal approach for powered mobility learning”.



“ Mastery motivation, or the internal desire for young children to explore and develop agency within their environment, is influenced by accessibility, safety, and space to play and interact with familiar and novel objects without structured direction.

”

- Feldner, Plummer & Hendry, 2022



Early learning stages: exploring function, focus on body and device

General info about stage

- Focus on establishing trust and building a secure relationship.
- Exploring the device before engaging in activation of the joystick to create positive association.
- Primary goal is movement as play and exploration.

Device Setup

- Place the child's favorite toy on the device, or play their favorite game on the table. This creates positive interactions with the device.
- Describe each action required when transferring into the device (lifting, wiggling, foot contact).
- After the child has entered the device, assess seating height; adjust to ensure optimal body positioning.
- It is important to ensure that the child has proper positioning and support. The seat and table height should be adjusted as necessary prior to the child entering the device and based on prior collaborative decision making for ideal driving position. Refer to the Explorer Mini User's Manual for adjustment instructions.

INTERVENTION TECHNIQUES

EARLY LEARNING STAGE

Device Use

- Plan for a natural environment such as their home or day care.
- Limit distractions, as much as possible, to encourage device interaction to allow for higher level of play.
- Avoid harsh overhead lighting and excessive noise.
- Encourage physical and social interaction with the child on or around the device.

Feedback and Cueing

- Incorporate multi-modal cueing for the child and within the environment.
- Attach bells or other noisemakers to the device to create noise when the device moves, if it evokes a positive or neutral response from the child.
- Acknowledge the child and the action when the device moves.
- Acknowledge frustration, establish frustration tolerance, attempt to calm or redirect the child first.
- Provide feedback about performance. “You used your hand to make it go!”



Intermediate learning stages: explore sequence, focus on body, device, and environment

General info about stage

- The child will start to operate the joystick to purposefully explore their environment, in addition to their body and the device.
- These stages are marked by a child beginning to engage in goal-directed movement of the device.
- They will gradually increase the complexity of tasks and processes with greater attention to the environment.

Device Setup

- Considerations for device setup are similar to those listed for the previous learning stage.
- However, additional experimentation with device positioning and exploration of different device speeds may be introduced.
- It is important to ensure that the child has proper positioning and support. The seat and table height should be adjusted as necessary prior to the child entering the device and based on prior collaborative decision making for ideal driving position. Refer to the Explorer Mini User's Manual for adjustment instructions.

INTERVENTION TECHNIQUES

INTERMEDIATE LEARNING STAGE

Device Use

- Consistently monitor and adjust the driving goals, behaviors, and responses to provide a “just right challenge.”
- If it is not distracting, engage siblings or peers in the training to encourage shared attention.
- Provide motivating toys, activities, or people within the driving space to encourage goal-directed driving.
- A more structured, task-oriented approach may be introduced to support learning of goal-directed mobility based on child’s response.

Feedback and Cueing

- The clinician or caregiver may use visual, tactile, or auditory cues to improve attention and facilitate skill acquisition.
- Encourage the child to take initiative and conduct their own learning through trial and error. “What other ways can you try?”
- Acknowledge frustration, especially when the driving goal is understood but not achieved.
- Allow mistakes to happen and encourage child to identify their own solution.



Advanced learning stages: exploring performance, focus on body, device, environment and activity

General info about stage

- This stage is a more complex interaction between a child, the device, their environment, and an occupation or activity.
- Improved precision, less need for supervision, and increasing independence with goal-directed driving.
- Advanced learners participate in group learning activities and are generally thought to be proficient or soon-to-be proficient.

Device Setup

- Considerations for device setup are similar to those listed for the previous learning stages.
- Recommend additional attention to increasing device speeds is to ensure that proficiency, safety, and joystick responsiveness are maintained with further degrees of freedom.
- The low ground clearance and small wheels of the Explorer Mini may impact navigation of more varied terrain that would happen at this stage. (See User's Manual for details)

INTERVENTION TECHNIQUES

ADVANCED LEARNING STAGE

Device Use

- The child may be encouraged to use the device in everyday, less controlled environments.
- Games or unstructured free play may offer a successful learning environment and responding to in-the-moment cues and actions.
- While maintaining safety is critical, it is important to allow learners at this stage to take perceived risks during driving play (though these behaviors may not entail actual risk). Experiencing perceived risk has been reported as a key factor in child motor and identity development.
- Practice navigation through doorways and varied surfaces such as thresholds and sidewalks.

Feedback and Cueing

- Engage in verbal dialogue with more sophisticated language and name expressions or emotions.
“Let’s go to the park.”
- Provide verbal instructions for an activity and let the child carry out the task using their own strategies.
“Your toys are in your room. Go get them!”
- Provide anticipatory cues to children about what to expect in more complex driving environments. i.e. “We are going through the classroom door, watch for bumps!”

Conclusion

The Clinician’s Guide to the Explorer Mini is a summary document intended to be a resource for clinical practice. While evidence-based recommendations have been presented, it is up to each individual’s clinical decision making to determine what the best approach is for the children that they interact with. We hope that this gives you the support, confidence, and evidence to start exploring!

To download the supportive document “A Guideline for Introducing Powered Mobility to Infants and Toddlers” by Feldner, Plummer, & Hendry, which was completed in 2022, you can use the QR below or visit: <https://www.permobil.com/clinical-research>

QR code to access the
guideline



CONCLUSION



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