

Applying the Principles of Motor Learning & Neural Plasticity to Pediatric Feeding Therapy

When should I target a skill in therapy?

Use It or Lose It: People who have no opportunity to learn a skill may lose the capacity to use it.

- Limit NPO recommendations to avoid disuse atrophy and facilitate motor learning.
- Provide safe opportunities for eating and drinking whenever possible.

Age Matters: People learn more easily when they are younger than they do when they are older.

- Provide early intervention for motor feeding skills.
- Ensure opportunities for learning are not unnecessarily delayed, e.g. late introduction of solids or textured foods for children with neurodisability.

Where should therapy happen, and with what materials?

Attention & Motivation: People learn best when they are focused and enjoy practicing.

- Make mealtimes enjoyable and interesting.
- Reducing distractions during the motor learning phase.
- Use hunger as a motivator by modifying meal/snack schedules.
- Use regulation strategies to support engagement and attention while learning a skill.

Salience Matters: People learn best when the task they are learning is rewarding and meaningful.

- Make mealtimes enjoyable with preferred foods, play, low-pressure exploration, and positive interactions.
- Use accessible, preferred foods to improve oral strength, endurance, and coordination.
- Minimize use of equipment, isolated 'exercises', and clinical settings, and if these must be used, make them as specific as possible. If you can't treat in a natural setting during actual mealtimes, provide families with home programming to promote carryover.

Variable Practice: People learn best when the context of practice varies.

- Practice in different locations, with different companions, and using different foods, utensils, or equipment.
- Coach caregivers to implement strategies in a variety of contexts.

Transfer of Learning: Learning is most useful when skills apply to daily life.

- Maximize home practice in daily routines and environments, integrating the principles of random and variable practice
- Select foods, liquids, utensils, and equipment that are easily accessible to the family.

What therapy tasks should I use?

Goal Complexity: People learn most efficiently when the practice task is as complex as they can achieve with support.

- Avoid breaking an oral motor task into parts (e.g. working on biting exercises in isolation). Instead, work on all the components of a motor task together wherever possible (e.g. biting in the context of a real eating scenario).

Random Practice: People learn best when they work on multiple targets randomly.

- Provide a variety of foods/fluids in random order. If working on advancing mastication skills, offer variability with meltable solids, soft solids, plus intermittent offers of purees or a drink.

Specificity: People learn faster and retain better by practicing tasks similar to the goal.

- Use food, mealtime contexts, and natural environments to teach motor skills.

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How often should I target skills?

Repetition Matters: People acquire a skill best by practicing a lot.

- Coach caregivers to provide many opportunities to practice motor feeding skills outside of therapy sessions.
- Use caregiver input to create home programming that works for their routine and environment.

Intensity Matters: People learn a new skill best by practicing many times in a row at first, and then spreading practices out as they generalize the skill.

- When a child is first learning a skill, give them lots of opportunities to practice all at once (massed practice).
- As they become more successful, encourage shorter opportunities to practice at multiple meal/snack times each day (distributed practice).

What support or instruction should I provide?

Implicit Learning: People learn more effectively by doing a skill and experiencing the outcome themselves, rather than being explicitly taught the movements required for a task.

- Use actual food, genuine mealtime contexts, and natural environments to teach motor skills.
- Provide modifications (e.g. bolus size and texture, pacing, postural support) to facilitate success.

Rehearsal Strategies: Ways of practicing that aren't functional, like pretending to complete the task (simulation), practicing part of the task in isolation (fractionalization), working on parts of the task separately and then joining them together (segmentation), or reducing the difficulty of the task (simplification).

- Where possible, avoid simulating motor feeding tasks (e.g. chewing on tools) or breaking them into parts (fractionalization and segmentation, e.g. by progressively working on types of tongue lateralization exercises outside of naturalistic tasks).
- Simplification may be helpful very early in practice if a child's motor feeding skills are very poor, but should be faded as soon as possible. Consider temporarily slowing the rate at which boluses are presented or modifying the size or texture of the bolus.

Extrinsic Feedback: People learn better when they receive feedback that is intermittent (not constant), delayed (not immediate), and focused on results (not performance).

- When a child is first learning a skill, give frequent knowledge-of-performance feedback in the moment— "You just moved that raisin onto your side teeth with your tongue! Great work!"
- As a child acquires a skill, reduce the amount of feedback, add a delay, and focus on results— "...Wow, you ate that raisin up!"



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