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Technical issues with the Recording?

- Clear browser cache using these instructions
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- Use a hardwired Internet connection
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- Call 866-782-9924 (M-F, 8 AM-8 PM ET)
- Email customerservice@OccupationalTherapy.com

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Motor Interventions in Early Intervention: Part 2

An introduction to the development of post walking skills for infants and toddlers

Jessica McMurdie, OTR/L

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Learning Outcomes

1. Identify 4 primitive reflex patterns that impact the acquisition of gross motor milestones.
2. Identify the developmental progression and sequence of post-walking gross motor skills
3. Identify several therapeutic activities to support the development of balance, strength and coordination of young children.

2

CONTINUED

Introductions

Jessica has 20 years of pediatric experience.

Stepping Stones Therapy Network

www.steppingstoneswa.com

PLAY IT FORWARD THERAPY

www.playitforwardtherapy.net

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CONTINUED

Bonus Handout: Gross Motor Checklist For Toddlers

This Cheat Sheet will …

- Give you an overview of key mobility skills for toddlers and preschoolers
- Enhance your clinical observations skills with a sequential, step-by step outline of GM skills
- Help you prioritize the most important criteria for mastering milestones
- Assist you with writing specific, measurable and functional goals
- Come in handy when explaining to parents and caregivers how to provide the just-right challenge for their child

4

How to access the BONUS Checklist to this course.

1. Go to www.playitforwardtherapy.net/gmchecklist2/
2. The checklist is sent via e-mail with a link to download the PDF

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Pediatric Intervention Framework

- **Targeted Skill or Activity**
- PURPOSE
- POSITIONING
- PRACTICE
- PLAY
- PROGRESS

Jessica McMurdie OTR/L

Q1

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CONTINUED

How do primitive reflex patterns impact a child's acquisition of gross motor milestones?

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CONTINUED

Primitive Reflexes

- Located in the upper brain stem
- Primary drivers of basic motor skills
- Innate, unconscious, and involuntary responses to specific stimuli
- Earliest pathways towards more refined movements
- Enable the infant to suck, blink, grasp, roll, and prepare for crawling

Q2

8

"Primitive reflexes are special reflexes which emerge and develop during life in the womb, are present at birth, and active for the first 6 months of postnatal life."

- Sally Goddard Blythe

9

Reflex Inhibition

- Increased cortical control results in the inhibition of primitive reflexes, which are slowly switched off in the brain stem.
- Some reflexes may disappear then reappear at certain stages of the infant's development.
- Primitive reflexes may be reawakened if there is an accident or brain injury to the higher centers of the brain.

10

Q3

10

CONTINUED

Reflex Integration

- Reflex integration occurs due to a combination of the central nervous system becoming more mature and physical interactions with the environment.
- Movements of the baby help map new motor pathways.
- Primitive reflex patterns are followed by more mature patterns called Postural Reflexes as higher-level cortical control develops and motor control becomes more refined.

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Reflex Integration

- The integration of primitive reflex patterns follows a specific timeline of integration in typical development.
- How and when the reflex is integrated influences the timing of motor skill acquisition.
- If a reflex is not integrated, it can interfere with typical patterns of movement and result in neurodevelopmental delays.

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If primitive reflexes are not fully integrated, they are likely to interfere with typical patterns of development and contribute to fine and gross motor delays.

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Risk Factors For Retention of Primitive Reflexes

- Medical and birth history
- Neurological problems
- Prolonged hospitalizations
- Limited opportunities for gross motor practice
- Insufficient tummy time
- Skipped developmental milestones
- Decreased strength & endurance
- Hypotonia

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CONTINUED

Primitive reflexes and GM Skills

- Moro Reflex
- Tonic Labyrinthine Reflex (TLR)
- Symmetrical Tonic Neck Reflex (STNR)
- Asymmetrical Tonic Neck Reflex (ATNR)

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CONTINUED

Moro Reflex

- The Fear Paralysis reflex is active in the womb and precedes the Moro Reflex in the infant
- Moro reflex may assist the baby in taking its first breath after birth
- Triggered by sudden unexpected events such as loss of head support
- Arms and legs extend, baby rapidly takes a breath "freezes" momentarily, then cries out as arms and legs return across the body

Q4

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Video 1: Moro Reflex

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The Startle Reflex

- The “Startle Reflex” becomes active by 4 months
- Triggered by a sudden or unexpected event in which the baby will ignore or respond to

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Video 2: Startle Reflex

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CONTINUED

Signs of Retained Moro Reflex

Retention beyond 4 months is associated with:

- Hyper- sensitivity and over-reactivity to sudden stimuli
- Motion sickness
- Poor balance and coordination
- Visual attention problems and distractibility
- Strong dislike of sudden unexpected change (bright lights, loud noises)
- Poor adaptability and dislike of change

Q4

20

Tonic Labyrinthine Reflex (TLR)

- Babies first response to gravity
- TLR is triggered with changes in head position forward or backwards

Positions:

- 1. When the head is flexed above the level of the spine, the body moves into flexion (fetal position)
- 2. When the head is not supported and extends below the level of the spine, the arms and legs move into extension

Q5

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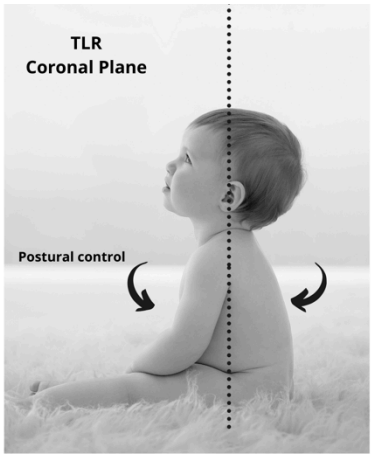
Tonic Labyrinthine Reflex



Q5

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TLR Inhibition

- Inhibition starts at 6 weeks of age as head control develops
- Multiple phases of integration throughout developmental milestones
- Fully integrated by 3 ½ years old

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Video 3: Baby G

25

CONTINUED

TLR Integration

- Precursor for head control
- Muscle tone
- Balance between front and back sides of the body
- Postural control required for sitting up and standing

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TLR Integration

Babies need opportunities for active play in prone and supine positions

Prone Extension

Tummy time pushing up on arms and lifting the head strengthens neck and postural muscles.

Supine Flexion

Supine flexion, bringing hands to midline and foot play

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Signs of TLR Retention

- Poor balance
- Postural problems
- Toe walking after age 3 1/2
- Muscle tone
- Ocular motor control problems
- Easily motion sick
- Possible vertigo

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CONTINUED

Tonic Neck Reflexes

- Associated with the proprioceptors in the neck muscles and the position of the baby's head and neck.
- Baby's head is in symmetrical alignment with the neck.
- Influences the muscle tone of the neck, trunk, and limbs.

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CONTINUED

Tonic Neck Reflexes

1. Symmetrical Tonic Neck Reflex (STNR)
2. Asymmetrical Tonic Neck Reflex (ATNR)

30

Symmetrical Tonic Neck Reflex (STNR)

- Precursor to maintaining an upright stance.
- Baby's head is in symmetrical alignment with the neck.
- Assists baby moving off the floor into a quadruped position to prepare for crawling.

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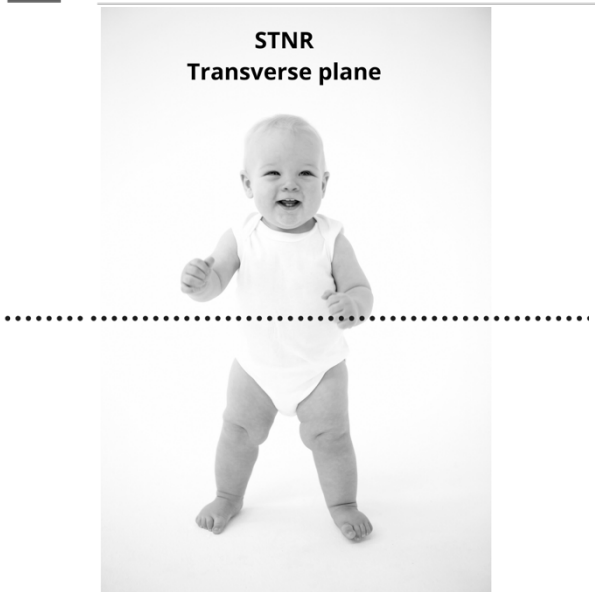

Q6

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STNR

Baby's head extends, arms extend and legs flex

Baby's head flexes, arms flex and feet push against surface into leg extension

Q6

33

CONTINUED

Video 4: STNR

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CONTINUED

Signs of a Retained STNR

- Crawling is critical!
- Retention of the STNR interrupts crawling.
- Crawling requires both sides of the brain communicating with each other.
- This further develops myelination across corpus callosum.
- Lack of crawling is highly associated with learning disabilities.

Q6

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Signs of a Retained STNR

- Baby moves in variations of crawling such as bunny hop, scooting, bottom shuffle, dragging one leg
- Convergence and divergence of the eyes
- Low muscle tone
- W-Sitting
- Poor posture, slouched
- Sacral sitting
- Fixing patterns

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STNR Integration

- Rocking back and forth in quadruped helps to integrate this reflex.
- Tabletop position with both arms and legs in extension at the same time with head facing forward.

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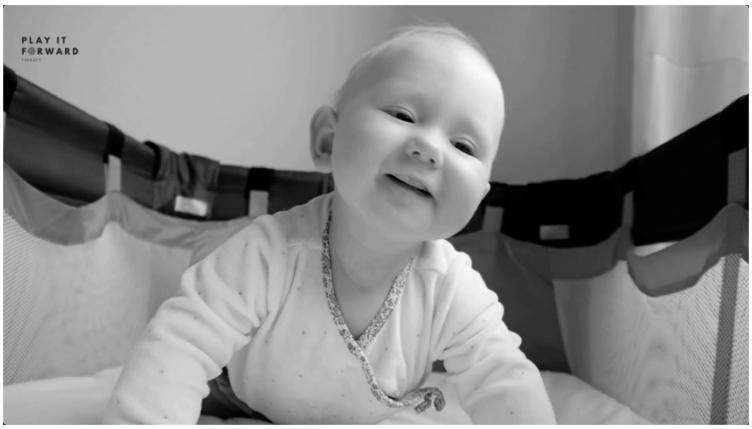
Video 5: STNR Integration



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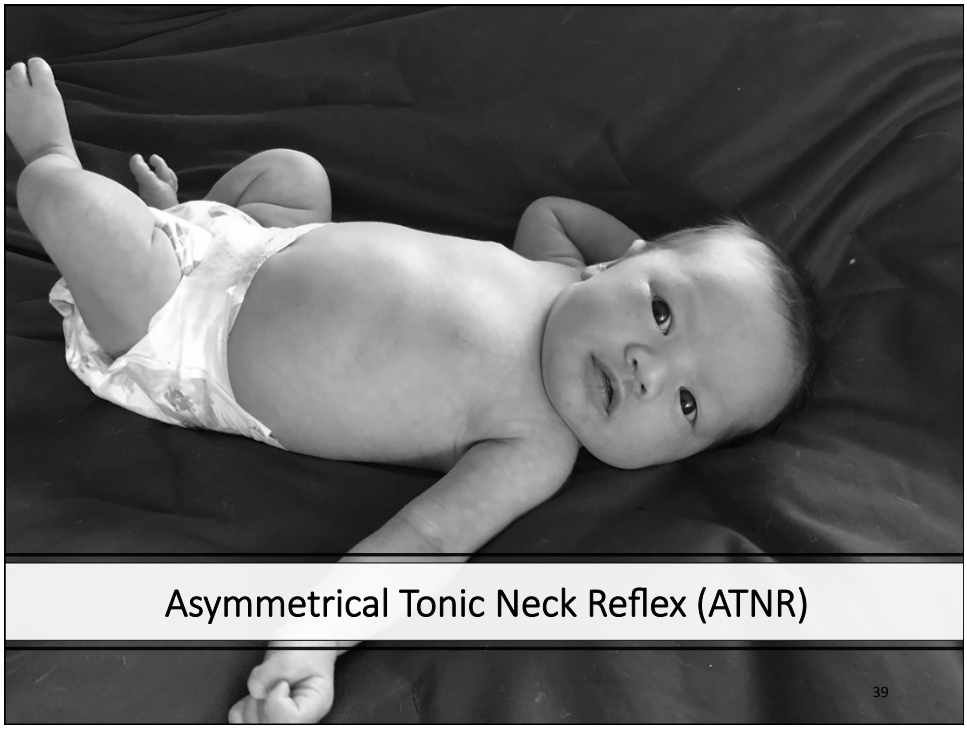

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ATNR
"Fencer Pose" or "Archer Pose"

- Position: Extensor pattern on the face side. Flexion pattern on the skull side.
- When the baby turns its head to the side, the arm extends on the face side and the other arm flexes on the skull side.

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CONTINUED

Asymmetrical Tonic Neck Reflex (ATNR)

- Assists baby moving through the birth canal
- Allows the newborn to turn the head to one side for breathing
- Early pathway for development of eye hand coordination
- Inhibition starts around 6 months. This reflex will appear and reappear for short periods of time until the balance required for each particular GM milestone is mastered.

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Signs of a Retained ATNR

- Lack of midline crossing
- Poor lateralization of both sides of the body
- Poor handwriting
- Poor pencil grasp
- Fixing postures at desk (head leans on hand)
- Heavy pencil pressure
- Low post rotary nystagmus (PRN)

Q7

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Dynamic Sitting
Trunk rotation & crossing midline

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CONTINUED

Why is it important to understand primitive reflexes in relation to gross motor milestones?

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A: Balance

The balance mechanism is reliant upon the following vestibular reflexes:

- Moro (head/multisensory)
- TLR (head)
- STNR & ATNR (neck reflexes)

All of these reflexes have a direct effect on muscle tone and balance which are essential foundations for gross motor skill development.

Q8

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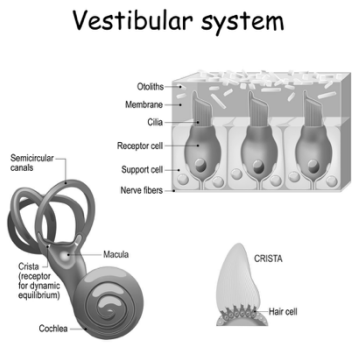
The Balance Mechanism

Sensory systems working together

- Vestibular System
- Proprioceptive
- Visual
- Tactile



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Video 6: Balance- Baby M.

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Developmental Progression of Gross Motor Milestones in Early Intervention

- Phase 1: Advanced Walking Skills
- Phase 2: Balance
- Phase 3: Climbing
- Phase 4: Jumping
- Phase 5: Ball Skills
- Phase 6: Riding a tricycle

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Supplemental Handout

Toddler Gross Motor Milestones Part 2 includes:

- Major gross motor milestones and transitional movements that typically occur between the ages of 1-5 years old.

1. Go to www.playitforwardtherapy.net/gmchecklist2/
2. The checklist is sent via e-mail with a link to download the PDF

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Advanced Walking Skills

1. Uneven surfaces
2. Up and down inclined surfaces
3. Variable height curbs
4. Fast walking and running

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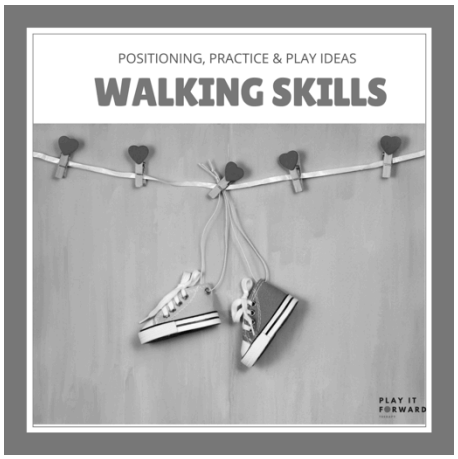
Video 7: Walking



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Phase 2: Balance Skills

- Navigating uneven surfaces
- Single leg stance activities
- Dynamic balance and postural control
- Balance beam skills
- Static & dynamic balance

Q9

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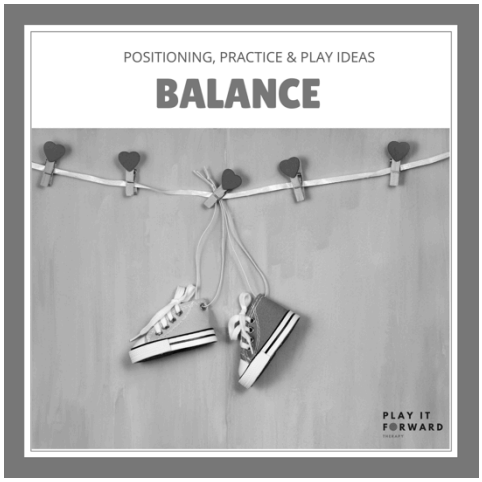
Video 8: Balance



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Phase 3: Climbing Skills

- On/off low surfaces
- Stairs
- Vertical ladders
- Other play equipment

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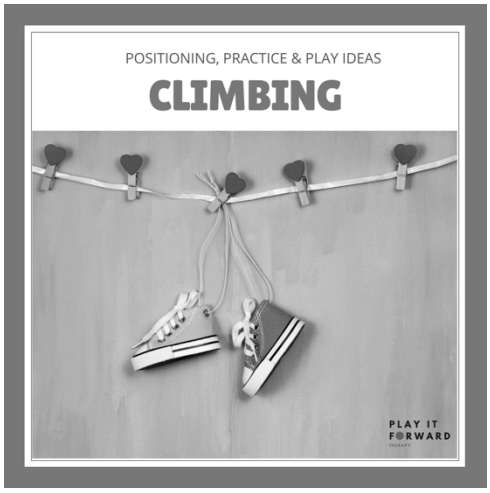
Video 9: Climbing Skills/Dynamic Balance



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Phase 4: Jumping

- Bouncy surfaces
- Trampoline
- Off the floor
- Forward
- Off a step (2,4,8 in.)

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Video 10: Jumping

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Phase 5: Ball Skills

- Kick
- Throw
- Catch
- Hit

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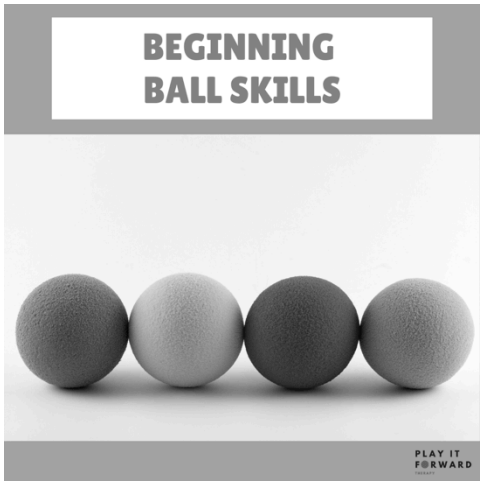
Video 11: Basic Ball Skills



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Phase 6: Ride on Toys

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TrackingGoal Progress

- Time
- Repetitions
- Level of support or assistance
- Environment
- Quality of the movement
- Generalization to home and community

Q10

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Summary of Learning

- Review of the 4 primary primitive reflex patterns impacting the acquisition of gross motor (GM) milestones
- Review of clinical observations and potential functional limitations of retained reflexes
- Identification of the typical developmental progression of GM skills in young children
- Review of treatment ideas to support the development of the balance, strength, and coordination

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Questions?

Connect with me: Jessica McMurdie OTR/L

- E-mail: jessica@playitforwardtherapy.net
- Explore more pediatric OT ideas at www.playitforwardtherapy.net
- Listen on "The Play It Forward Therapy Podcast"

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