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Practical Application of Ergonomic Principles: Preventing Musculoskeletal Disorders in New Mothers

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August 8, 2019

Learning Outcomes

As a result of this course, participants will be able to:

• List physiological and psychological factors that make mothers a ‘specialized population’ for occupational therapy intervention
• List ergonomic risk factors present when postpartum mothers are performing childcare related tasks
• Discuss a prevention and/or health promotion approach to caregiving for young infants/children and practical strategies for postpartum mothers to implement
New Mothers – A Special Population

OTPF-3 ➔ Child rearing (IADL)
AOTA, 2014

OT and Ergonomics

- Return to work after an injury or illness or in the presence of disability
- Health promotion – assessments and interventions to optimize function
- Injury prevention education
- Consulting with employers and/or insurance companies to keep workers’ comp costs low

Support the worker and promote workplace wellness

AOTA, 2017
OT and Maternal Health

- Women are asking for more support and information in the perinatal time period
- Holistic perspective is needed
- Health promotion model and/or prevention model
  - Serving the ‘well’ mom & baby population
- Occupational therapy can fill this need
- Various methods for delivering the information
  - Face-to-face, virtually, print education

Sloomjes, McKinstry, & Kenny, 2016

Postpartum Care

- Association of Maternal & Child Health Programs
  - “reimagine the postpartum visit and improve postpartum care and wellness” p. S39.
- Need for “mother-centered solutions” because we know that improving women’s health can improve maternal and infant health
- Will mom seek help?

Cornell et al., 2016
Physiological Risk Factors

- Soft tissue edema
- Ligament laxity – relaxin & estrogen production
- Weight gain (+ ligament laxity = joint discomfort)
- Weakened core muscles: Abdominals, pelvic floor
- Sleep deprivation
- Shift in center of gravity
- Emotional stress of new role (plus other roles)

Borg-Stein & Dugan, 2007; Robson, Iqbal & Howarth, 2009

Health Risks of Motherhood: Slippery Slope

Postpartum stress

Anxiety
Fatigue
Decreased self care

Increased risk for physical and mental illness

Impacts health of entire household

(Fahey & Shenassa, 2013)
Link to Postpartum Depression

- Connection between body posture, pain & PPD
  - Back pain may be a risk factor and comorbidity of PPD
  - Mental and physical symptoms & changes are interdependent (Angelo et al., 2014)
- Connection between exercise/wellness interventions & PPD prevention
  - Exercise has psychosocial impact postpartum
    - Weight loss
    - Less costly & time intensive than other interventions
    - Teaches healthy behaviors to engage in long term (Lewis et al., 2018)

Prevention & Health Promotion

“Using an evidence-based approach, occupational therapy practitioners can contribute to preventing pain, increasing function, and promoting meaningful occupations during pregnancy and the postpartum period” (p.1).

- OT practitioners are seeing women during the perinatal period in clinics with musculoskeletal diagnoses
- Women expect pain/discomfort during perinatal period – may not talk about it
- OT can address issues preventatively via health promotion (Fernandes, 2018)
When problems begin…

Caring for a newborn or infant can lead to:

- Static Positioning
- Repetitive Activities
- Awkward Postures
- Forceful Exertions

MSD symptoms can begin within the first few weeks to months.

Mother’s symptoms typically ignored—focus on baby’s needs.

Performing child care activities for children from birth to 3 is “perceived to place the greatest demands for physical care on mothers.”

(Maynard & Blain, 2005, p. 362)

Musculoskeletal Disorder

**AKA**

- Cumulative Trauma Disorder
- Repetitive Stress Disorder/Injury
- Overuse Syndrome

- Repetitive motion during a task
- Sustained position over time
- Forceful movement
- Awkward postures/positions
- Pressure points (contact stress)
Postpartum changes +
Ergonomic stress of child care =
MSD

Postpartum Goals

Caring for mom
• Physically
• Mentally
• Emotionally
  impacts health of whole household
Maternal Concerns with MSDs

- “Maternal concerns should be taken seriously; a ‘just accept it’ attitude by staff should be replaced by assessment for therapy”
  (Robson, Iqbal & Howarth, 2009, p.148)

- “Reassurance and patient education are critical”
  (Borg-Stein & Dugan, 2007, p. 472)

Why OT Needs to Address This

- Case report of 32 yo female with deQuervian’s
  - SAHM of 2 boys (7 mo. & 3 y.o.)
  - Onset from pulling wagon on daily walks
  - Relationship to biomechanical strain of child care recognized BUT … suggestions for tx. were …
  (Papa, 2012)

- Miami Herald (2017) Ask the Physician
  - Woman with thumb/wrist pain without known etiology, WAHM who does computer work, gardens & has 3 mo. old
  - Response of deQuervain’s is normal postnatally! … suggestions for tx were …
Conservative Management (?)

- Orthosis
- Oral Medications
- Steroid Injection
- Ice/Modalities
- Outpatient Therapy
- Surgery

Taking Ergonomics Out of the Office

Organization = "Job" of Motherhood

- Job Tasks:
  - Feeding, Bathing
  - Changing diapers
  - Lifting, Carrying
  - Playing

- Workers = New Mothers

- Tools & Equipment:
  - Bottles, Baby food
  - Crib, Play gyms
  - Car seat, Stroller
  - Infant carrier

Environment: Home, Car, Community

Adapted from R. Dahl in Haruko Ha, Page & Wietlisbach, 2006
Teaching Ergonomics in the Home

- Study looked at ergonomic education of women with MSDs
  - Cooking, cleaning, grocery shopping, laundry, childcare
- Emotion and routine attached to these tasks
- Behavior changes are needed to decrease biomechanical strain
- Challenges in adherence
  - Be client centered
  - More likely to change if clients feel ‘listened to’

Cheung et al., 2018

Common Areas of Discomfort

- Low Back
- Upper Back
- Hips
- Shoulders
- Neck
- Wrist
- Thumbs
- Knees
Common Risk Factors

- Forceful Exertions
- Repetitive Activity
- Awkward or Static Positioning
- Contact Stress

deQuervain’s Tenosynovitis

- Sit et al. (2017) study of 259 Chinese women
  - 57% reported wrist pain after childbirth
  - Felt new mothers had increased risk within first 8 weeks due to lack of experience of demands of childcare tasks
  - Hypothesis that other factors were baby’s size, breastfeeding, and attending antenatal classes
Wrist/Thumb Positioning Tips

- Avoid the “L” position
- Keep a neutral wrist
- Use larger joints/muscles
- Loosen your grip

Breastfeeding

- Cross-cradle hold intended for newborn stage
- Mom semi-reclines with baby tummy-down against chest – move baby to breast and not breast to baby
- Positioning pillow to support arm (not baby) & lean back to reduce gravity
- Avoid the “L”
- Try different positions: Football hold, side lying, back lying

Shepherd, 2015; Roberts, 2011
Bottle Feeding

- Neutral wrist
- Loosen grip on the bottle
- Avoid the “L” if possible
- Think about baby’s positioning
  - Weight on larger joints
  - Reduce strain on fingers & thumb

Shepherd, 2015; Roberts, 2011

Stroller Position

- Relaxed shoulders
- Soft bend in elbows
- Neutral wrist
- Neutral forearm
- Thumb position
- Consider vibration
Lift/Hold/Carry

- Avoid the “L” and scoop baby
  - Older children can be picked up by ‘scooping’ with thumb tucked under the axilla
- Neutral wrist
- Keep baby’s weight on forearm
- Baby carrier for ‘hands free’ holding
  - Babywearing International

Back Pain

- Mannion et al. (2015)
  - Back pain and urinary incontinence impact on maternal function @ 12 months postpartum (1574 women)
  - 77% were experiencing back pain with wide range of functional impact (>% than impact of UI)
  - Improved function with daily tasks improves quality of life
  - If these symptoms are common & impacting function, we know what care is need to improve it
Posture Tips

- There are ‘normal’ curves in your back
- These curves MUST be maintained (especially the lumbar or low back)
- Neutral to anterior pelvic tilt
- DO bend at your hips (and knees)
- DO NOT bend at your waist

Disk Pressure through Spine

- Supine (laying face up)
- Side-lying
- Standing
- Seated
- Standing – bend forward at hips
- Seated – bend forward at hips
- Standing – bend w weight
- Seated – bend w weight
Neck & Shoulders

- Head and neck in ‘midline’ and not bent forward
- Shoulders relaxed and away from your ears (neither elevated or depressed)
- Shoulder blades (scapula) level and slightly retracted (pulled together)

Feeding

- Breast or Bottle
  - Try to get comfortable before baby latches
  - Choose a comfortable ‘seat’
  - Consider footrest
  - Maintain lumbar curve of spine
  - Avoid cervical flexion
  - Neutral or anterior pelvic tilt
Floor Play

- Keep lumbar curve
- Neutral to anterior pelvic tilt
- Avoid cervical flexion
- Use supports if possible
- Great time to stretch!

Picking Object Up/Lifting

- Be close to the object you are moving
- Face the object head on
- Bend your knees – use your legs, not back
- Keep a neutral spine (maintain normal curves)
- Keep a wide base of support
- Keep your heels down
- Avoid combining movements
  - Rotating + bending forward or backwards
What leads to MSDs when lifting?

- Pain reported in low back (64%) followed by neck/shoulder/upper back (32%)
- Occurs during bending, squatting, stooping, lifting
  - Bending while carrying most stressful
- Factors
  - Child’s weight
  - Mom’s grip
  - Equipment & space constraints
  - Strength/fitness of mom
  - Reach distance
  - Trunk rotation

Vincent & Hocking, 2012

Hold/Carrying Baby

- “There is a need … to introduce appropriate ergonomic training and interventions on infant carrying tasks in order to improve maternal musculoskeletal health during childbearing years & beyond” (p. 855).
- Burden of carrying in arms > with device
- Options studied
  - Back carry
  - Side carry
  - Front carry in arms
  - Front carry with device
- Consider biomechanical impact on type of carry

Ojukwu, et al., 2017
Car Seat

- Risk factors
  - lift and twist
  - working in a tight space
  - pinch strength for buckles

Car Seat

- Recommendations
  - Face the backseat head on
  - Tuck the thumbs under axilla to lift
  - Try to lift in the position you are placing
  - Encourage independence when ready
  - Buckle release devices
Stretching

- Low back – Lying on back, bring knees into chest
- Shoulders – Shrug up/down; shoulder rolls
- Upper back – Pull shoulder blades together, apart
- Neck – Look up/down, left/right, ear to shoulder, pull chin back and push forward
- Wrists – Wrist flexors (prayer stretch); Wrist extensors (tennis elbow stretch)
- Cat stretch – On all fours, arch back like a cat

Strengthening

- Create gentle strengthening programs*
  - Transverse abdominus
  - Engage pelvic floor
  - Consider postural muscles of back
  - UE strengthening without stressing the wrist/thumb
- Suggestions from Duffin (2012) study
  - Keep track of exercises
  - If not performed, state why
  - Record discomfort during exercise
  - Assess improvement, same, or worse
  - Feelings before and after exercise
  - Use diaper changes as cues to stretch/breathe/etc.
Summary of Suggestions

- Look at grip and wrist position
- Look at environment: height of objects, reach, arrangement of items
- Decrease frequency of lift/hold/carry
  - Encourage independence, get help when available, get cooperation from child
- Decrease stress/strain of task
  - Consider mood/behavior of child
- Stretch during the day
- Strengthen in preparation for childcare tasks

Start with ONE change
Questions?

Please ask!

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References

References (continued)