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Occupational Therapy Role in the PICU

Lisa Hoffman – OT (Canada)
Sonia Riley – OT (Australia)

CANCUN MEXICO

SickKids, Toronto PICU/CCCU

- 42 beds (including 18 CCCU)
- OT Staffing: CCCU: 0.5FTE (0.2 Neurodev)
  PICU: 1.0 FTE

Lisa Hoffman
Occupational Therapist

Queensland Children's Hospital PICU

- 36 beds including (surgical, medical – incorporates cardiac surg)
- OT Staffing: approx. 1.0FTE
  (2.0FTE across PICU and Cardiac service)

Sonia Riley
Occupational Therapist

Outline

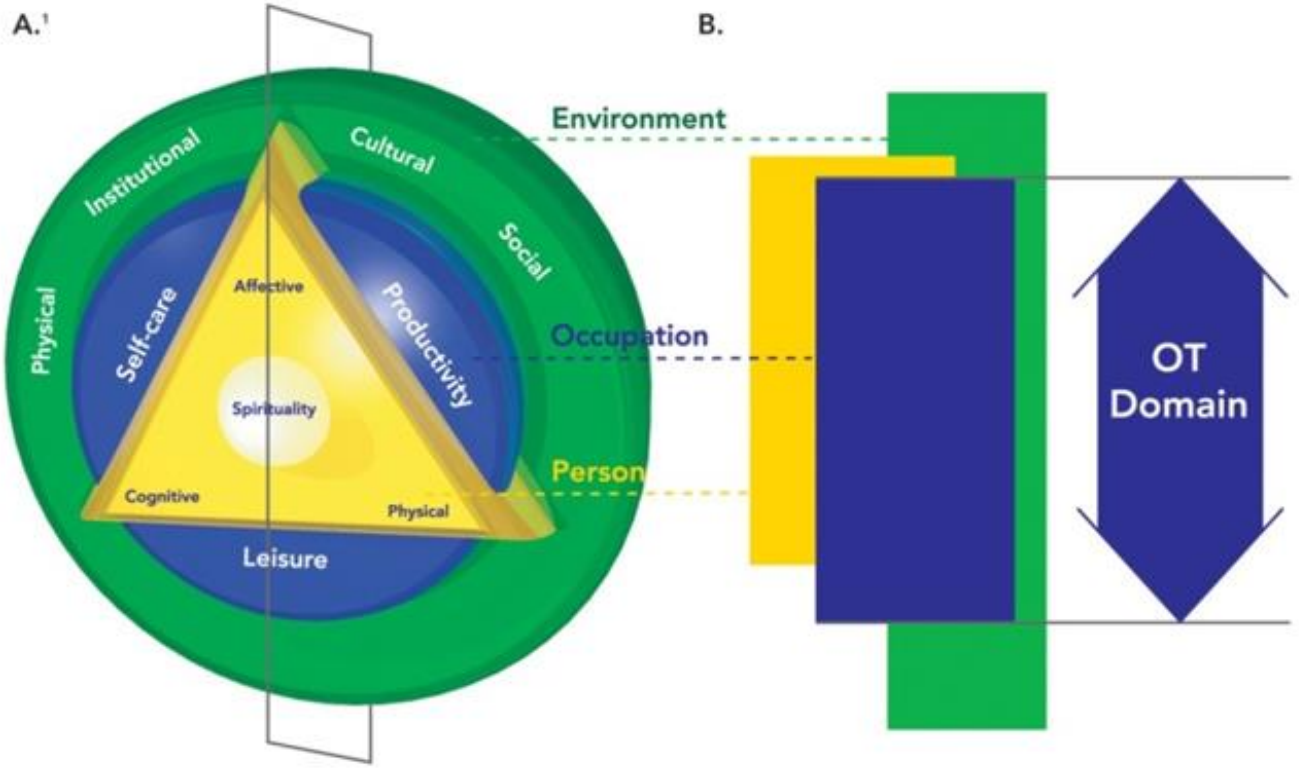
- What is Occupational Therapy?
  - OT perspective/framework
  - OT in PICU?
- Impact of critical illness/PICU admission
- How does OT add value in PICU?
- Working with infants in intensive care
- Working with older children in intensive care
- Case examples
- Discussion

What is Occupational Therapy?

- Occupational Therapy (OT) is a health profession that empowers people of all ages to overcome barriers in their everyday lives so they can do more and live better.
- In the acute paediatric setting, OT aims to minimise the impact of hospitalisation, illness, or medical treatment on the child (and their family), and maximise their function and quality of life.

Focus*: Person-Environment-Occupation*

Occupational Therapy Framework



A.[1] Referred to as the CMOP in *Enabling Occupation* (1997a, 2002) and CMOP-E as of this edition
B. Trans-sectional view

Polatajko, H. J., Townsend, E. A., Craik, J. (2007). *Canadian Model of Occupational Performance and Engagement* (CMOP-E). In E. A. Townsend and H. J. Polatajko, *Enabling Occupation II: Advancing an Occupational Therapy Vision of Health, Well-being, & Justice through Occupation*. p.23 Ottawa, ON: CAOT Publications ACE.

What are childhood occupations?

- "occupations" are the things that we do each day

Eating	Dressing	Bathing	Toileting
Grooming	Sleeping	Thinking/ Learning (school)	Tasks at home / within family
Playing	Games/ sports	Hobbies	Social Activities

Can also include the healthcare-related tasks that children need to do

PICU Environment

Literature – Impact of critical illness

- Decline in neurofunctional status occurs in 3-20% of children following ICU stay – worse in those admitted for neurological diagnoses.

(Caprarola et al, 2017)

- **Paediatric post-intensive care syndrome** more well-recognized . Long-lasting impairments in physical, psychological, cognitive and social functioning are described. 30-50% of PICU survivors experience substantial reductions in quality of life after discharge.

(Hopkins et al, 2015; Watson et al, 2017)

- **Functioning** and **QoL** are emerging as key patient-centered outcomes during recovery from critical illness

(Fayed et al, 2020)

- An **interprofessional approach** including early mobilization, normalising experiences, and individualised PICU-based rehabilitation have been highlighted as important for outcomes

(Choong et al, 2018; Walker & Kudchadkar, 2018)

Literature – Occupational Therapy in ICU

Review Article

The role of the occupational therapist in the Intensive Care Unit: a systematic review

A atuação do terapeuta ocupacional em Unidade de Terapia Intensiva: uma revisão sistemática

Estéfanny da Silva Bittencourt[a], Paula Silva Moreira[a], Glenda Miranda da Paixão[a], Marcelo Marques Cardoso[a]

FEATURE ARTICLE

WILEY

Occupational therapy service provision in adult intensive care units in Australia: A survey of workload practices, interventions and barriers

Andrea Rapolthy-Beck[1,2,3] | Jennifer Fleming[3] | Merrill Turpin[3]

Functional Recovery in Critically Ill Children, the "WeeCover" Multicenter Study

Choong, Karen MB[1]; Fraser, Doug[las] MA[2,3]; Cheng, Ji Pi[n]

[...]rbi, Samah MD[4]; Borham, Asm MSc[1]; Cameron, Jill PhD[5,6]; Cameron, Saoirse [...]ty, Tim MD[2,3]; Fayed, Nora PhD[7]; Gorter, Jan-Willem MD[1]; Herridge, Margaret [...]abrook, Jamie PhD[2,3]; Simpson, Racquel MA[1]; Thabane, Lehana PhD[1]

[...]ruary 2018. | DOI: 10.1097/PCC.0000000000001421

children

MDPI

Article

Individualized Goal Setting for Pediatric Intensive Care Unit-Based Rehabilitation Using the Canadian Occupational Performance Measure

Youngsub Hwang [1], Jeong-Yi Kwon [2,*], Joongbum Cho [3] and Jaeyoung Choi [3]

ONLINE REVIEW ARTICLES

Occupational Therapy in the ICU: A Scoping Review of 221 Documents

Costigan, F. Aileen OT Reg (Ont), PhD[1]; Duffett, Mark RPh, PhD[2,3]; Harris, Jocelyn E. OT Reg (Ont), PhD[4]; Baptiste, Susan OT Reg (Ont)[4]; Kho, Michelle E. PT, PhD[1,4]

Author Information

Critical Care Medicine 47(12):p e1014-e1021, December 2019. | DOI: 10.1097/CCM.0000000000003999

Jarvis *et al. BMC Pediatrics* (2020) 20:415
https://doi.org/10.1186/s12887-020-02306-3

BMC Pediatrics

RESEARCH ARTICLE Open Access

Caregiver dissatisfaction with their child's participation in home activities after pediatric critical illness

Jessica M. Jarvis[1,2], Nora Fayed[3], Ericka L. Fink[4], Karen Choong[5†] and Mary A. Khetani[1*†]

Changing Needs of Medically Complex Children and Families

- Increase in the number of children in hospital and the community who are 'medically fragile'
- Complex and/or technology dependent children with longer admissions
- Invasive medical interventions: chronically ventilated, suspended/open chest post cardiac surgery, ECMO, VADs etc.
- Sedated and/or restrained
- Lines/Technology –> restricted movement

How does OT add value in PICU?

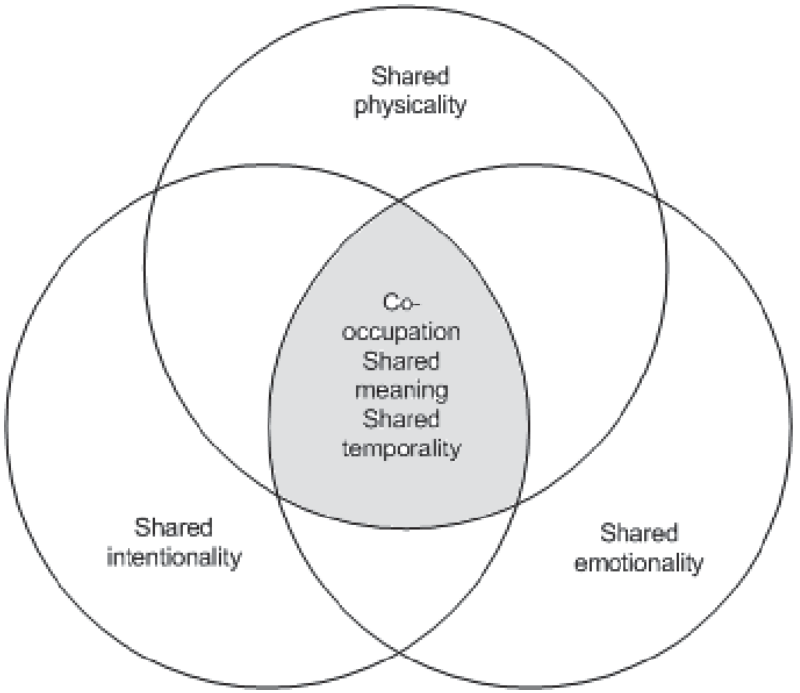
- Holistic view
- Look at strengths and abilities of the child to engage in occupations within context of the environment (including sensory, physical, social-cultural environment)
- Skills in being able to adapt task/demands and environment to enable participation
- Occupations as both the treatment modality and the outcome/goal
- Role of child within the family unit
- Thinking beyond the ICU

Risk Assessment

- Risk assessment is important before commencing with a patient in PICU (understand what is going on before walk in the door)
  - physiological factors - physical presentation, medical needs/cardiorespiratory stability, post-op precautions etc).
  - Arousal and responses (eg sedation level, delirium)
  - Medications (sedation, analgesia, paralysis, cardiovascular support etc)
  - Current interventions (eg ECMO, breathing support, renal filter)
  - What attachments/lines are present?

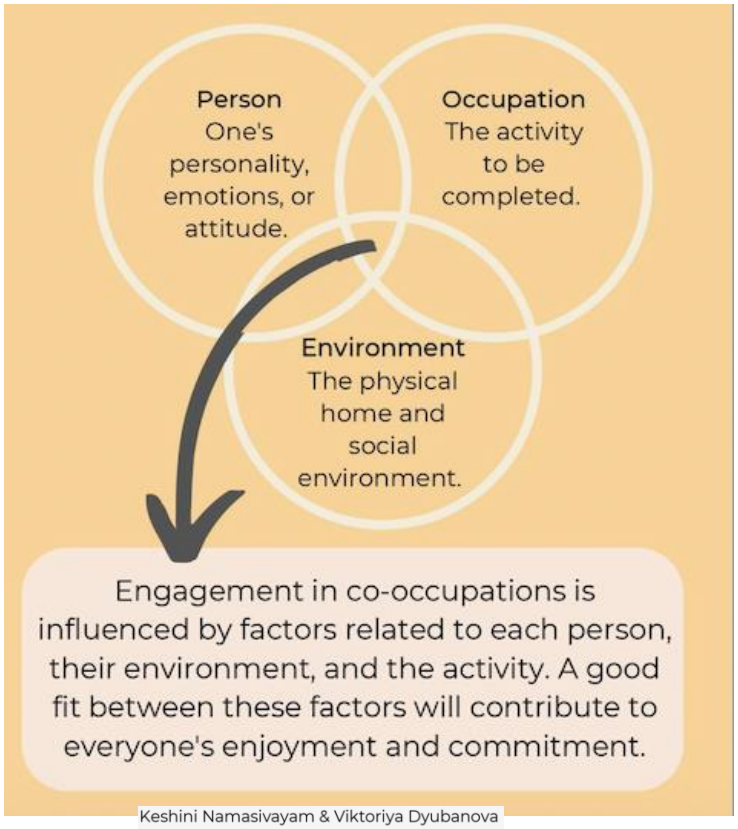
Co-Occupation in the PICU/CCCU

- Shared meaningful activity done by 2 or more people
- Interdependence
- Synchronicity
- “Doing Together”
- E.g. Breastfeeding, soothing, carrying, dressing, bathing, playing together…

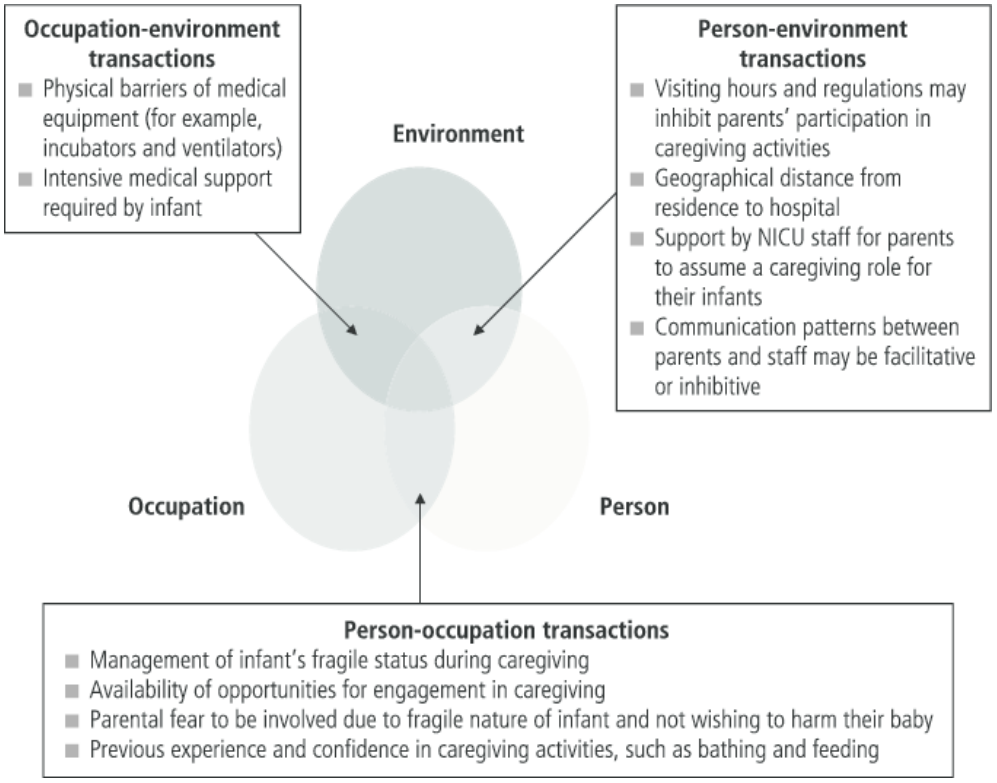


Doidge, K. 2012

Co-Occupation in the PICU: "Doing Together"



Keshini Namasivayam & Viktoriya Dyubanova
MScOT Students at the University of Toronto



Gibbs et al, 2010

Supporting Early Neurodevelopment in ICU

- **Developmentally supportive care** is a philosophy and framework to **optimize ND** in the hospital.
- **Most at risk:** younger children who have not achieved motor, cognitive and social milestones, or those who have a prolonged and/or complicated ICU stay
- **OT's** are experts at analyzing & addressing the impact of both person & environment factors that influence developmental function

Intrinsic Individual Factors:

♥ **Extrinsic:** Task, Experience & ***Environment***

OT role with Infants in Intensive Care

- Supporting early neurodevelopment (including positioning and handling, graded sensory stimulation, positive touch, motor development)
- Supporting engagement in infant occupations (including arousal/regulation, play and early learning, interaction/ engagement, feeding, sleep)
- Supporting caregiver roles in care (including carrying, feeding, ADL's)

The Critical Care environment is stressful!

Potential Developmental consequence
Poor state regulation
Motor delay and deconditioning
Loss of range of motion, plagiocephaly, torticollis
Delayed acquisition of social-emotional skills
Sensory processing difficulties
Delayed oral motor skills and oral defensiveness
Delayed communication skills

Infant Behavioural State Regulation

Good Regulation

- Smooth movements
- Ability to calm self and/or be calmed by caregiver
- Easy transitions between sleep and alert states
- Ability to maintain calm alert state

Poor Regulation

- Frantic or jittery movements
- Unable to calm and/or be calmed by caregivers
- Sudden transitions between sleep and alert states
- Not able to achieve CALM alert state
- Autonomic changes: colour changes, HR and RR changes, hiccups

Using the Sensory System to Decrease Stress and Improve State Regulation

- Important to provide sensory stimulation that is developmentally appropriate AND situation specific
- Consider the child's behavioural state; a child that is hyper-alert and distressed may need sensory input REDUCED
- Introduce sensory input one at a time and watch the child's reaction as it is introduced
  - Touch
  - Sound
  - Smell
  - Interoception
  - Movement
  - Vision
  - Taste

Supportive Therapeutic Positioning

Goal to support joints, avoid muscle contracture, improve midline orientation and facilitate self-regulation

Supine

Prone

Side Lying

Supported Sitting & Seating Opportunities

Upright seating benefits:

- Development of head/trunk control
- Social Engagement & Play
- Better for respiratory effort, cough strength
- Variety of options:
- In parent's arms – important for bonding
- Infant seat
- Booster seat/High Chair
- Tumbleform
- Specialized Seating/Wheelchairs

Tummy Time:

- Important to the development of neck, chest, arm and back strength
- Be aware of sternal precautions
- Helps to prevent positional preferences and plagiocephaly
- Other benefits: respiratory, GI, self-soothing
- More challenging in ventilated patients due to tubing but can be done with alternative positioning
- Alternative positioning achieves similar goals & has other social benefits

ADL's, Caregiving & Neurodevelopment:

Lifting/Transfers

Skin-to-Skin, Holding, encircling

Oral Stim, Pre-Feeding

Promoting Individualized Infant Neurobehavioural State Regulation in ICU: Bedside Poster

OT DEVELOPMENTAL CARE RECOMMENDATIONS FOR YOUR BABY

Hospitalized and premature infants can be quite sensitive to excess stimulation in their environment. They can become easily overstimulated and stressed. This makes it hard to maintain a calm, alert state. We can help by reducing excess stimulation in the environment & by encouraging self-soothing behaviours that will help baby stay calm in order to learn new developmental skills.

These things may stress or startle Me:

- Light, "tickly" touch
- Sudden, loud noises (i.e. monitors beeping, loud talking)
- Unexpected, quick movement/handling
- Bright lights
- Being unbundled from blankets
- Painful procedures
- Diaper changes & bath time

"Time Out" Stress Signals *may* include:

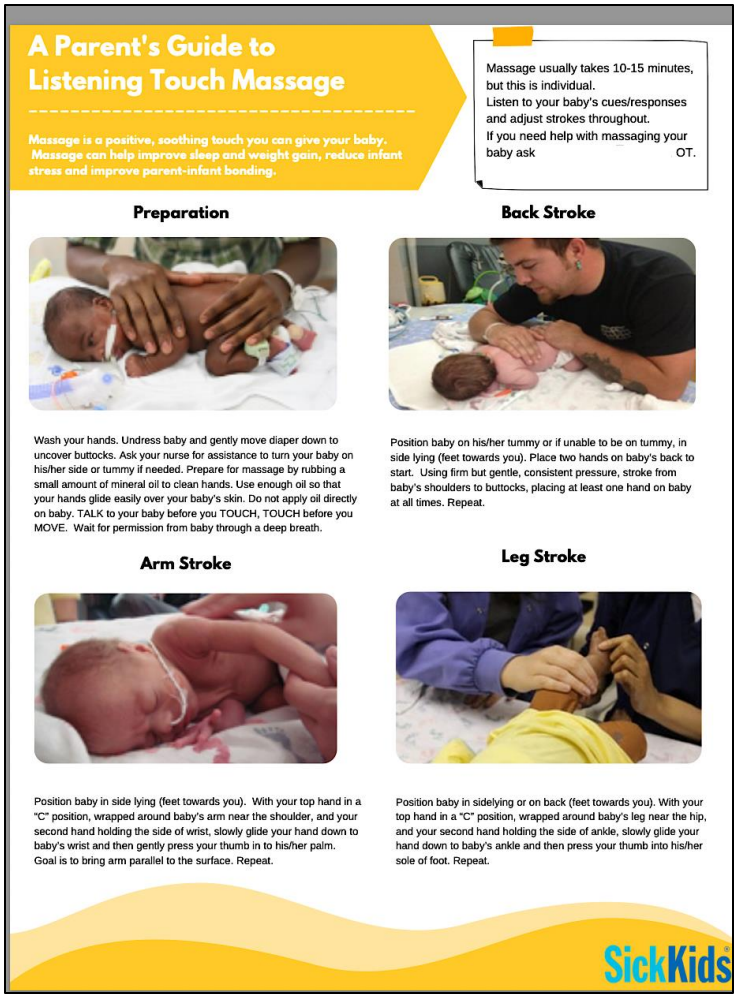
- Arching my back & neck
- Stiffening my arms & legs
- "Jittery" arm & leg movement; tremors
- Avoiding eye contact by looking away
- Changes in heart rate and breathing pattern
- Changes in skin colour
- High pitched crying, irritability
- Panicked, worried facial expression

How You Can Help Me with Calming & Self-Soothing:

- Use *firm, deep pressure* touch when handling. Deep pressure touch is less irritating than light touch
- Move me *very slowly* when providing cares. Give me a brief break if I get too upset.
- Non-nutritive sucking on pacifier: dip it in milk for me to suck to help me soothe myself.
- 2-person caregiving: Have one person hold me (e.g. mom, co-RN) while primary RN provides cares
- Diaper Changes: roll/move me very slowly to my sides vs. lifting my legs up quickly when changing me.
- Bathing: move me very slowly; try loosely swaddling during bath, uncovering one limb at a time.
- Tummy Time position soothes me especially when I can suck on my pacifier or hand. I also like massage.
- Vertical Rocking: rock me up and down in your arms or on your chest
- Reduce noise level by moving away from crib & talking quietly

Questions? Contact your Occupational Therapist, Lisa Hoffman

Neonatal Touch & Massage



A Parent's Guide to Listening Touch Massage

Massage is a positive, soothing touch you can give your baby. Massage can help improve sleep and weight gain, reduce infant stress and improve parent-infant bonding.

Massage usually takes 10-15 minutes, but this is individual.
Listen to your baby's cues/responses and adjust strokes throughout.
If you need help with massaging your baby ask OT.

Preparation

Wash your hands. Undress baby and gently move diaper down to uncover buttocks. Ask your nurse for assistance to turn your baby on his/her side or tummy if needed. Prepare for massage by rubbing a small amount of mineral oil to clean hands. Use enough oil so that your hands glide easily over your baby's skin. Do not apply oil directly on baby. TALK to your baby before you TOUCH, TOUCH before you MOVE. Wait for permission from baby through a deep breath.

Back Stroke

Position baby on his/her tummy or if unable to be on tummy, in side lying (feet towards you). Place two hands on baby's back to start. Using firm but gentle, consistent pressure, stroke from baby's shoulders to buttocks, placing at least one hand on baby at all times. Repeat.

Arm Stroke

Position baby in side lying (feet towards you). With your top hand in a "C" position, wrapped around baby's arm near the shoulder, and your second hand holding the side of wrist, slowly glide your hand down to baby's wrist and then gently press your thumb in to his/her palm. Goal is to bring arm parallel to the surface. Repeat.

Leg Stroke

Position baby in sidelying or on back (feet towards you). With your top hand in a "C" position, wrapped around baby's leg near the hip, and your second hand holding the side of ankle, slowly glide your hand down to baby's ankle and then press your thumb into his/her sole of foot. Repeat.

SickKids

- Infant-Parent Attachment & Bonding Opportunity
- Positive touch
- Improved state regulation
- Decreased pain
- Sleep
- Growth
- Decrease pain behaviours

Acknowledgment: Poster Courtesy Lori Burton, OT, SickKids

OT role with older children in Intensive Care

- Facilitate participation in age-appropriate occupations (ADLs, play, productivity and leisure)
- Modify environment to enhance occupational performance (e.g. sensory environment, equipment)
- Minimise neurological or biomechanical risks and potential impact on occupational performance (e.g. splinting, positioning)
- Support occupational performance in hospital-related tasks/occupations
- Facilitate developmental progress and/or early rehabilitation
- Cognitive assessment
- Discharge planning

Children may present with a variety of functional or cognitive changes, for example:

- Significant change in occupational performance due to trauma or medical condition
  - multi-trauma
  - Acquired brain injury
  - Cardiac arrest with downtime
  - stroke/neurological event, seizures
  - Respiratory difficulties requiring breathing support
- Severe deconditioning, global weakness (e.g. following ECMO, extended period of mechanical ventilation, prolonged admission)
- Difficulties engaging in daily activities (eating, dressing, bathing, toileting, mobility) due to condition or its treatment
- Atypical behaviours, cognition changes, delirium

Facilitating participation in age-appropriate occupations

- Early engagement in ADLs, productivity and play/leisure activities
- Consider different positions that support engagement (and that are developmentally-appropriate)
- e.g. mat, chair, sitting in bed, away from bedside.
- Consider lines/attachments
- Support predictable routine

- Consider impact of motivation, mood, individual goals, and stage of recovery
- Grade participation (e.g. hand-over-hand assist with mouth cares→ child does part of task only → independent brushing of teeth)
- Environmental adaption / use of equipment to enable participation
- Child & Family Empowerment

About Julian:

Julian has autism and is non-verbal. Julian finds the hospital environment frightening.

Communicating with Julian:

- Julian's understanding is at approximately 2-3yo level
- Please keep directions simple
- Use key words
- Use positive encouragement (eg good rolling, good helping)
- Good words to use: CALM, SAFE, HELP, OKAY

Cares:

- Julian will try to help with basic cares
- Please cluster cares when possible
- Responds better to "hands off approach"

Sensory environment:

- Please maintain a quiet, calm environment
- Unexpected or loud sounds can be distressing for Julian
- Use strategies to help Julian to stay calm – eg chewy tube, use of gentle music

Feeding/Swallowing Function

- Oral-Motor and/or swallowing dysfunction
- Post-extubation dysphagia; VCP risk
- Decreased SSB coordination
- Decreased endurance
- GI issues: GERD, nausea, dysmotility,
- Poor State Regulation; Narcotic withdrawal
- Oral hypersensitivity/feeding aversion
- Co-morbidities: Prematurity, Genetic syndromes, Neuro

"The complications of swallowing impairment or dysphagia include aspiration, reintubation, pneumonia, and consequently prolonged duration of ICU and hospital stay"
([4,6,7]) Macht et al, 2013; Macht, 2011)

Feeding/Swallowing: OT Role

- Clinical Assessment
- Videofluoroscopic swallowing study (VFSS)
- Interventions:
  - Positioning
  - Texture
  - Temperature
  - Taste
  - Bolus size
  - Speed of bolus presentation
  - Timing, Volume & Duration

Early Identification improves health, LoS & QoL outcomes!

Pre-Feeding Skills & Oral Stimulation

- "Pre-Feeding" Readiness:
- Encourage hands to mouth and bringing toys to mouth.
- Provide pleasant oral-motor and facial stimulation.
- Skin-to-Skin Holding
- OIT, pacifier
- Teething toys
- Safe Oral Feeding Experiences

Minimising neurological or biomechanical risks / Considering performance components

This may include:

- Supporting appropriate environment for early recovery (e.g. low stimulus environment post ABI, prevention/management of delirium)
- Upper limb reviews and intervention – early UL retraining, strength/ROM Ax, oedema mgt
- Splinting/positioning
- Supporting hand use for play, ADL
- Exploring sensory preferences/processing
- Early cognitive assessment

Cognitive Assessment

Who to Refer:

- Stroke, TBI, ABI
- Any change in cognitive function
- Cardiac arrest, post-ECMO
- Prolonged intubation/ICU LoS
- Significant personality/behavioural changes

Timing of Assessment:

- LoC
- Some ability to participate
- Baseline history re: function
- Informal vs Formal Ax

Cognitive Domains Evaluated:

- Orientation
- Attention
- Short, Long-term, Working memory
- Information processing
- Visual Spatial/Perception
- Executive function - inhibition, problem solving, insight, judgement, impulsivity

Always consider: how this relates to functional performance (e.g. ADL, productivity, play/leisure)

Supporting occupational performance in hospital-related tasks/occupations

- High risk for post traumatic stress disorder (PTSD) in children after a PICU admission.
- Invasive Procedures + LoS + Severity of Illness = adverse long term effects, PTSD, significant medical fears (Rennick et al, 2002)
- OT role may include:
  - Assisting with preparation for procedures for patient who is awake e.g. Age-appropriate education through play, using play to help child understand what to expect during procedure.
  - Supporting normal routine, roles, and relationships
  - Anxiety management e.g. Relaxation strategies or distraction

Discharge planning

- Consideration of usual roles and occupations, home and school environments as part of initial occupational performance assessment → discharge planning begins from the time of admission.
- At times will discharge home directly from PICU (eg long-term ventilation).
- Early identification of need for further inpatient rehab or community therapy services
- Assessing potential home equipment needs

Measuring Outcomes

- PICU Core data set (Fink et al, 2020)
- Additional assessments relevant for OT:

Occupation-based	Motor	Cognition	Sensory	Neuro-developmental
FIM/WeeFIM	MMT	Coma Recovery Scale (SRC)	Nottingham	Prechtl's General Movements
COPM	Modified Ashworth	MOCA	Pain scales (faces, FLACC, CPOT)	HINE
	ROM	LANCE	ASIA	AIMS
	Dynamometer	PRPP		NNNS
		Cognistat, LOTCA		ASQ (screen)
		PTA / COAT		
		CAP-D / pCAM		

OT role in CCCU at SickKids

- Neurodevelopment
- Feeding/Swallowing
- Cognition & Neuro-Rehab:
  Neurologic changes vs Delirium
- ADL's: early mobilization,/rehab & discharge planning
- Sensory processing, Self-regulation

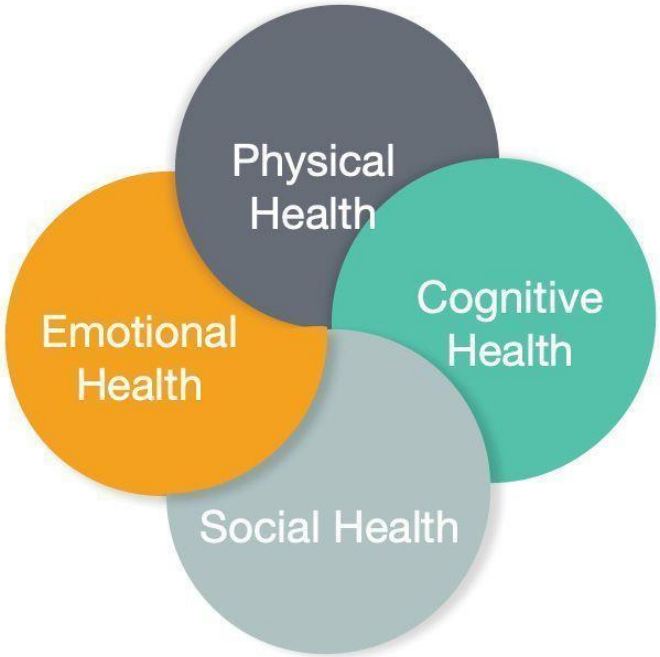


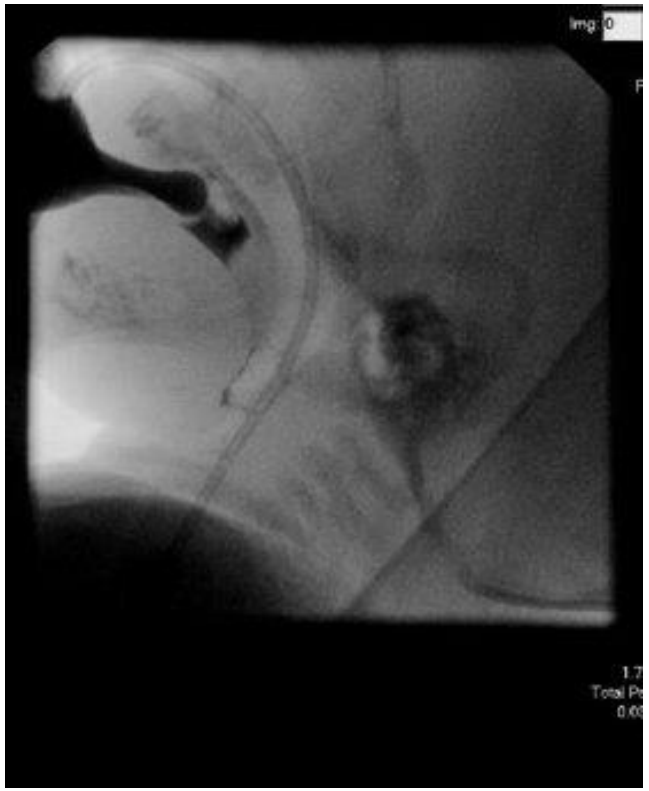
Figure 1. The four key domains of PICS-p model

CCCU: Case Study *A.F.*

- 2-mos old male
- Single ventricle physiology
- Prolonged ~1-year hospitalization due to complex course/complications:
  - Decreased cardiac function
  - Left vocal cord paralysis
  - Left diaphragm paralysis
  - Some changes on MRI brain
  - HHFNC +/- CPAP dependent
  - GERD; GJ tube; TPN
  - Osteopenia
- OT primary therapist in CCCU during ~11-mos admission.

OT Role: *A.F.*

- Assess & Support:
  - Tone/ROM/Movement Quality
  - GM & FM Skills
  - Adaptive Skills
  - Sensory Processing
  - Feeding/Swallowing/VFSS
  - ADL's
  - Equipment
  - Early D/C planning



OT Role *A.F. :*

- Neonatal Massage for State Regulation

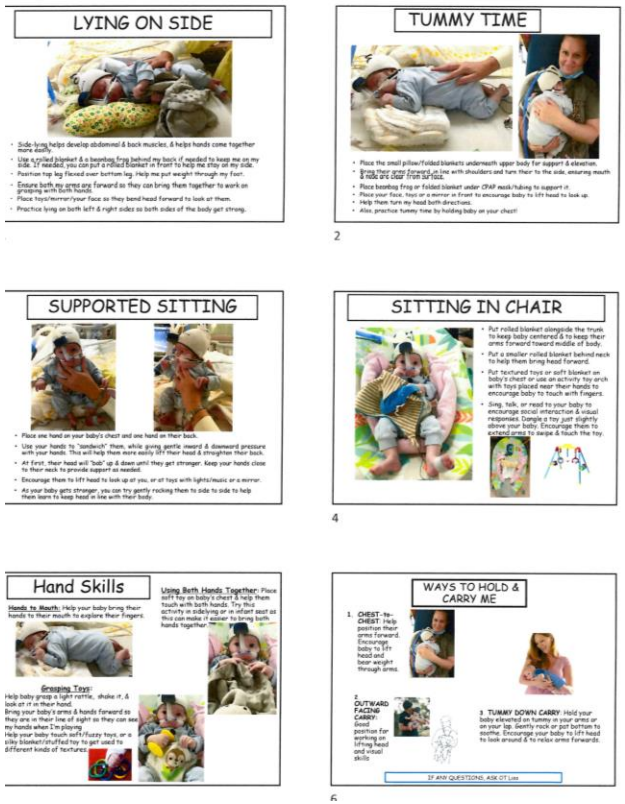
Therapeutic Positioning

- ADL's: Osteopenia Education

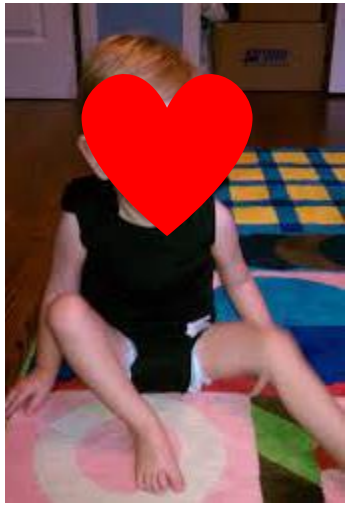
Acknowledgment: Poster courtesy Suzanne Breton, NICU OT, SickKids

OT Role: *A.F.*

- Bedside Developmental Program



- Equipment: Compression Orthoses



Oral Feeding Program:

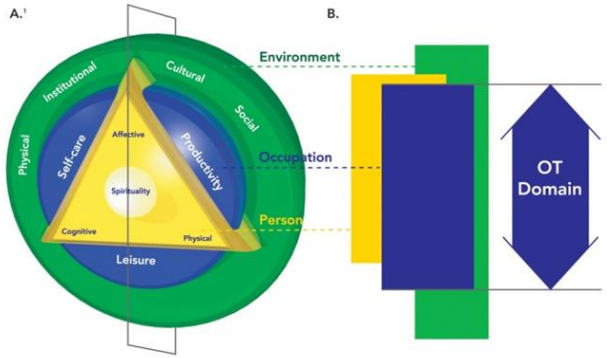
Referrals: Music Therapy; Clown; SLP; PT

OT role in PICU at QCH

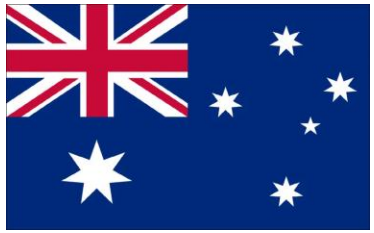
PICUstars Liberation at QCH

- **A** Assess prevent & manage pain
- **B** Both spontaneous awakening trials & spontaneous breathing trials
- **C** Choice of analgesia & sedation
- **D** Delirium: assess, prevent & manage
- **E** Early mobility & exercise
- **F** Family engagement & empowerment
- **G** Good nutrition
- **H** Humanism

Baby Liberation



- Support early neurodevelopment
- Support participation in occupations as able (early mobilization / early rehabilitation)
- Assessment of cognition (e.g. neurological changes; PTA; delirium)
- Support engagement in health-care occupations
- Support person factors to influence above areas (e.g. sensory processing, regulation, arousal, ROM)



PICU: Case Study Abi

- 6 year old girl
- admitted via peripheral hospital (13 July)
- streptococcus pneumoniae ARDS
  - Rapid progression intubation → HFOV same day (14 July)
  - VV-ECMO (19 July – 27 August)
- Tracheostomy (24 Aug)
  - Decannulated Sept after d/c to ward
- During PICU stay – drug reaction, pneumothorax requiring ICC, feed intolerance, failed decannulation, L vocal cord palsy

PICU: Case Study Abi

More importantly from OT perspective…..

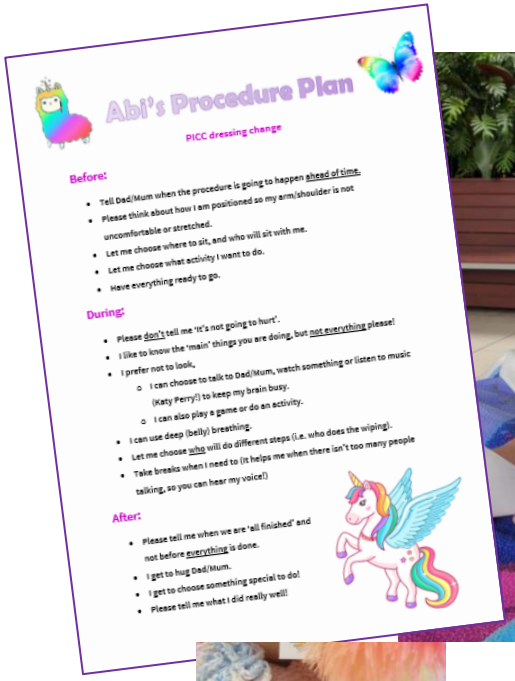
- 6 year old girl who lives with her parents and older brother
  - Loves her big brother!!!
- Started prep this year – enjoys, seems to be progressing appropriately
- Independent/age-appropriate ADL pre-admission
- Loves soccer and karate
- Loves unicorns, rainbows, and “Frozen”
- Loves arts and crafts - particularly glitter and sparkles

OT Role Abi

- Initial Ax – getting to know Abi
- Review biomechanical risks – including splinting and positioning needs
- Arousal/responses – early communication and graded cognitive engagement
- Supporting parent (family) involvement in cares

OT Role Abi

- Promoting daily routines, predictability
- Motivation/mood
- Tolerance of cares/procedures
- Play opportunities – including UL use, positioning, fun!
- Grading participation in ADL (including equipment as needed)



Abi's Procedure Plan

PICC dressing change

Before:

- Tell Dad/Mum when the procedure is going to happen ahead of time.
- Please think about how I am positioned so my arm/shoulder is not uncomfortable or stretched.
- Let me choose where to sit, and who will sit with me.
- Let me choose what activity I want to do.
- Have everything ready to go.

During:

- Please don't tell me 'it's not going to hurt'.
- I like to know the 'main' things you are doing, but not everything please!
- I prefer not to look,
  - I can choose to talk to Dad/Mum, watch something or listen to music (Katy Perry!) to keep my brain busy.
  - I can also play a game or do an activity.
- I can use deep (belly) breathing.
- Let me choose who will do different steps (i.e. who does the wiping).
- Take breaks when I need to (it helps me when there isn't too many people talking, so you can hear my voice!)

After:

- Please tell me when we are 'all finished' and not before everything is done.
- I get to hug Dad/Mum.
- I get to choose something special to do!
- Please tell me what I did really well!

Discussion & Questions?

Summary:

- Set-up the environment for success
- Provide developmentally appropriate opportunities/experiences
- Position to allow movement/function
- Regulate stimulation level
- Mobilize early and often
- Identify Red Flags
- Engage parents and family in care early & often
- Utilize interprofessional expertise (OT, PT, SLP, CLS, MT, RAT)

Hot tips / Ideas for starting out

- Consider what gets "foot in the door"?
- It's OK to start small
- Partner with other more established disciplines
- Follow patients from ward to ICU?
- "Liberation" (ABCDEF/bundled approach)
  - gives wonderful opportunity for OT… other clinicians are "talking our language"
- Being present and visible: Attend IPP/Education rounds & present cases
- Education: RN, Resident orientation

Thank you for your attendance and participation!

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