Marissa Johnson, MSN, RN, CNL, RNC-LRN, TIP

Over the past 6 years Marissa has been the Clinical Practice Leader in the level 4 NICU at The University of Iowa Stead Family Children's Hospital. In her role she specializes as the developmental care coordinator and staff educator for neuroprotective care. She has been working on updating practice and standards of practice to improve the neuroprotective interventions that align with the most current evidence-based practice. Over the past years her focus had included family partnership, infant feeding, infant positioning, skin-to-skin practices, and trauma informed care. In September of 2023, Marissa took on a new role as the systems manager for quality and patient safety for the children's hospital. When she is not busy at work, Marissa enjoys spending time with her husband, Brad and 2 daughters Kennady (14) and Adley (10), cheering on her daughters’ sporting events, boating in the summer, and reading.
Rediscovering Your Passion, Purpose, and Path Forward

Marissa L. Johnson, RN, MSN, CNL, RNC-LRN, TIP
April 27, 2023
Disclosures

• I have no relevant financial relationships with any commercial interests to disclose
Objectives

1. Describe innovative strategy that one Level 4 NICU used to improve their unit culture supportive of neuroprotection and a trauma informed environment.

2. Outline opportunities in your NICU to improve neuroprotective care.

3. Describe attributes to become a trauma informed professional to improve personal and professional well-being.
Level 4 Academic Medical Center

88 NICU Beds

1000 NICU Admissions per Year

250+ Staff Nurses

Hemodynamics Program

Chronic Lung Program

Neurocritical Care Program
Our Achievements
You may better know us by...

3 Million
Survival of Inborn “Periviable” Infants 22 - 24 weeks EGA with a “Proactive Approach” (2006-2021)

<table>
<thead>
<tr>
<th>Weeks</th>
<th>22</th>
<th>23</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survival</td>
<td>60%</td>
<td>76%</td>
<td>85%</td>
</tr>
<tr>
<td>Number of live born infants</td>
<td>74</td>
<td>117</td>
<td>120</td>
</tr>
</tbody>
</table>

64% survival at 22 weeks for NICU admissions (69 admissions with 44 survivors)

Outcomes of Inborn Infants: Acute Morbidity 2006-2021

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Severe IVH</th>
<th>Cystic PVL</th>
<th>VP Shunt</th>
<th>NEC incidence</th>
<th>ROP Laser therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>22-week NICU admissions</td>
<td>69</td>
<td>23%</td>
<td>6%</td>
<td>3%</td>
<td>12%</td>
<td>9% in survivors (44)</td>
</tr>
<tr>
<td>23-week NICU admissions</td>
<td>115</td>
<td>17%</td>
<td>7%</td>
<td>2%</td>
<td>9%</td>
<td>3% in survivors (89)</td>
</tr>
</tbody>
</table>
Clinical Outcomes

Current CLABSI rate = 0.5/1000 central line days

Current unplanned extubation rate = 0.75/100 vent days

2022 Falls: Zero

Current 12mo average HAPI Rate: 0.25/patient days
It takes a Village

• Baby
• Parents
• Siblings
• Extended Family

• Doctors/NP's/Residents
• Nursing
• Respiratory Therapists
• Pharmacy

• Dieticians
• Social Work
• Phlebotomy
• Rehab Therapy Staff

• Housekeeping
• Child Life Specialists
• Nursing Assistants
• Unit Clerks
• And More........
Why are we here?
What is Trauma?

An event, series of events, or set of circumstances an individual experiences as physically or emotionally harmful that can have lasting adverse effects on the person’s functioning and mental, physical, emotional, or spiritual well-being.

- can occur outside caregiving relationships (e.g., dog bites, natural disasters),
- within the context of the caregiving relationship (e.g., domestic violence, abuse or disordered caregiving because of parental mental illness or substance use disorder),
- on in the context of relationships outside the family (racism, bias, discrimination, bullying)

- Adverse events that lead to the frequent or prolonged activation of the stress response in the relative absence of protective relationships has been termed “toxic stress” in the pediatric literature. Toxic stress responses result from events that may be long lasting, severe in intensity, or frequent in occurrence.

- Almost one-half of American children, or 34 million younger than 18 years, have faced at least 1 potentially traumatic early childhood experience
What about NICU? Is it a traumatic place?
Outcomes of Trauma

WHAT IMPACT DO ACEs HAVE?

As the number of ACEs increases, so does the risk for negative health outcomes

Possible Risk Outcomes:

BEHAVIOR
- lack of physical activity
- Smoking
- Alcoholism
- Drug use
- Missed work

PHYSICAL & MENTAL HEALTH
- Severe obesity
- Diabetes
- Depression
- Suicide attempts
- STDs
- Heart disease
- Cancer
- Stroke
- COPD
- Broken bones
Brain Development

- The brain develops hierarchically from the bottom up and inside out
- Lowest brain centers are involved with activating defensive stress reactions
- Middle area of the brain, limbic, provides a base for memories and emotions
- Most recently developed, neocortex, self-reflect about emotional experiences and stress
What does it take to create a trauma free environment?
Trauma Informed Care Core Measures

- Healing Environment
- Protected Sleep
- Pain & Stress
- Activities of Daily Living
- Compassionate Collaborative Relationships
### Pillars of Bedside Developmental Care Training

<table>
<thead>
<tr>
<th>Healing Environment</th>
<th>Individualized Care</th>
<th>Strengthening and Supporting Families</th>
<th>Working Collaboratively</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Attention to sounds</td>
<td>• Positioning</td>
<td>• Welcoming to bedside</td>
<td>• Communication</td>
</tr>
<tr>
<td>• Lighting</td>
<td>• Infant handling during care times</td>
<td>• Providing education</td>
<td>• Timing of care</td>
</tr>
<tr>
<td>• Pleasant smells</td>
<td>• Minimizing stress and pain</td>
<td>• Reading infant cues</td>
<td>• Procedural support</td>
</tr>
<tr>
<td>• Protecting and safeguarding sleep</td>
<td>• Protecting skin</td>
<td>• Participation in cares</td>
<td>• Two person supported care</td>
</tr>
<tr>
<td></td>
<td>• Optimizing nutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Supporting transfers when able</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Caption: University of Iowa Stead Family Children’s Hospita]
Department of Nursing – Guideline DN.G.CWS.02.012

SUBJECT/TITLE: Care of the Extreme Low Birth Weight (ELBW) Infant (for infants < 26 weeks gestation and/or ≤ 1000 grams)

PURPOSE: To describe the standards of care for this at-risk patient population.

SCOPE: NICU nursing staff

SUBJECT: Neuroprotective Care for the Premature and Term Infant

PURPOSE: To provide patient specific neuroprotective care for premature infants of varying gestations. This is a guide to follow related to the patient’s current gestational age (post menstrual age).

SCOPE: NICU nursing staff, NICU rehab staff.

Departmental Guideline Manual

Departmental Policy Manual

University of Iowa Stead Family Children’s Hospital

Standards of Practice
### Considerations: Infant Stability and Stress Signs

<table>
<thead>
<tr>
<th>Infant System</th>
<th>Signs of Stability</th>
<th>Signs of Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Autonomic</strong></td>
<td>Steady HR</td>
<td>HR 15 beats above baseline or Brady cardiac</td>
</tr>
<tr>
<td></td>
<td>Smooth regular breathing (40-60)</td>
<td>RR above 60 or below 40</td>
</tr>
<tr>
<td></td>
<td>Stable oxygen saturations</td>
<td>Increased WOB, desaturation</td>
</tr>
<tr>
<td></td>
<td>Even skin color</td>
<td>Color change</td>
</tr>
<tr>
<td></td>
<td>Visceral stability</td>
<td>Hiccup, gag, spit up, BM grunts, diarrhea</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tremors or twitch</td>
</tr>
<tr>
<td><strong>Motor</strong></td>
<td>Tucking</td>
<td>Extended away from midline</td>
</tr>
<tr>
<td></td>
<td>Midline</td>
<td>Arching, flailing</td>
</tr>
<tr>
<td></td>
<td>Hands to face or mouth*</td>
<td>Limp, flaccid</td>
</tr>
<tr>
<td></td>
<td>Hand Grasping *</td>
<td>Finger or toe spaying</td>
</tr>
<tr>
<td></td>
<td>Hand and/or foot clapping*</td>
<td>Fist in the air</td>
</tr>
<tr>
<td></td>
<td>Bracing feet*</td>
<td>Eyebrow raise, worried look, grimacing, blinking</td>
</tr>
<tr>
<td></td>
<td>Energy during care</td>
<td>Gaze aversion, gaze face</td>
</tr>
<tr>
<td></td>
<td>Rooting and suck searching</td>
<td>Delayed or absent rooting</td>
</tr>
<tr>
<td></td>
<td>NNS with autonomic stability*</td>
<td>Limited non-nutritive sucking skills</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td>Restful, stable sleep</td>
<td>Lacking restful, stable sleep</td>
</tr>
<tr>
<td></td>
<td>Smooth transitions between sleep and awake</td>
<td>Rapid transitions between awake and sleep</td>
</tr>
<tr>
<td></td>
<td>Stirring at caregiving times</td>
<td>Shuts down</td>
</tr>
<tr>
<td></td>
<td>Establishing skill of waking on own</td>
<td>Awake with no energy, not available</td>
</tr>
<tr>
<td></td>
<td>Relaxed alertness for 5-10 minutes</td>
<td>Not stirring prior to cares</td>
</tr>
<tr>
<td></td>
<td>Available</td>
<td>Stressed when awake; difficult to console</td>
</tr>
<tr>
<td></td>
<td>Consolable</td>
<td>Inability to wake or sustain wakefulness on own</td>
</tr>
<tr>
<td><strong>Attention/Interaction</strong></td>
<td>Autonomic, motor, and state stability during</td>
<td>Inconsistent or poor performance</td>
</tr>
<tr>
<td></td>
<td>Skin to skin, arrest, during care, when held, during tube feedings, with non-nutritive sucking, while orally feeding</td>
<td>Autonomic, motor or state system instability</td>
</tr>
<tr>
<td></td>
<td>Able to participate during caregiving with self-regulatory behaviors</td>
<td>Avoidance/defensive/stress behaviors</td>
</tr>
<tr>
<td></td>
<td>Engagement – sustaining state and energy</td>
<td>Passive or disengaged</td>
</tr>
</tbody>
</table>

* = Key self-regulatory behaviors
# Developmental Care Map

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;29 weeks</td>
<td>Family: Touch: Positive touch, hand-swaddling, skin-to-skin when appropriate.</td>
</tr>
<tr>
<td></td>
<td>Activity: Promote rest and sleep, promote interaction.</td>
</tr>
<tr>
<td></td>
<td>Positioning: Avoid excessive left or right side positioning.</td>
</tr>
<tr>
<td>29-38 0/7 weeks</td>
<td>Family: Touch: Encouraged with every interaction, Activity: Promote rest and sleep.</td>
</tr>
<tr>
<td></td>
<td>Positioning: Avoid excessive left or right side positioning.</td>
</tr>
<tr>
<td>31-36 0/7 weeks</td>
<td>Family: Touch: Encouraged with every interaction, Activity: Promote rest and sleep.</td>
</tr>
<tr>
<td></td>
<td>Positioning: Avoid excessive left or right side positioning.</td>
</tr>
<tr>
<td>33-36 0/7 weeks</td>
<td>Family: Touch: Encouraged with every interaction, Activity: Promote rest and sleep.</td>
</tr>
<tr>
<td></td>
<td>Positioning: Avoid excessive left or right side positioning.</td>
</tr>
<tr>
<td>≥37 weeks</td>
<td>Family: Touch: Painful procedures, Activity: Painful procedures.</td>
</tr>
</tbody>
</table>

**Neuroprotective Care for the Premature and Term Infant DN.P.CWS.02.030**
Development

- Daily skin-to-skin holding. Today's Kangaroo Care: 
- Support me during procedures/interactions
  - Enough... 
  - Talk, sing, read to me
  - Presence
  - Presence

Environment

- Lighting: Cover my eyes from direct bright lights
  - Day
cycle
  - 33 weeks: dark lighting
  - 33 weeks: low lights in daytime and darkness during night
  - Feeding: moving lighting as tolerated
- Positioning:
  - Limit moving: it can be stressful for me
    - gah/gah

Feeding

- Hold me skin-to-skin in daily
- Hold me for tube feedings when able or position side-lying
- Offer my _______ position during NG/PJG feeds when I am showing cues
- Offer, when coming:
  - Pleasant oral swabbing with ____________
  - Dips of milk
Positive Touch

- Every touch counts
- Slow, firm, gentle touch
- Safeguard sleep
- Approach
  - Care clustering
  - Infant cues
- Parental
  - Finger holding
  - Hand hug
  - Skin-to-skin
- Education
Sound vs Noise

- Negative vs Positive
- Decibels
- Interventions:
  - Lower your voice
  - Educate on cell phone use
  - Educate families
## Lighting

<table>
<thead>
<tr>
<th>&lt; 33 weeks</th>
<th>≥ 33 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain dark environment</td>
<td>Day-Night Cycling</td>
</tr>
<tr>
<td>Protect eyes from bright lights (eye hearts)</td>
<td><strong>Day time:</strong> ≤ 100 lux of lighting (dim light)</td>
</tr>
<tr>
<td>Cover isolette with blanket</td>
<td><strong>Nighttime:</strong> darkness</td>
</tr>
<tr>
<td><strong>Lighting Lux Goal:</strong> Less than 10</td>
<td></td>
</tr>
</tbody>
</table>

*Term PMA >37 weeks: encourage homegoing lighting
*Critically ill patients and those on stress precautions may require individualized lighting and darkness
* Post Term: maintain lights on during daytime

---

HOW IS LIGHTING MEASURED?

- 10 lux = Dark
- 100 lux = Dim lighting
- 200 lux = Average restaurant lighting
- 300 lux = Reading a book
- 500 lux = Average retail space lighting
Reading

Eat UP: Why Reading to Your Patients is Important!

Why read to your patients?

- Instrumental in creating & strengthening neural connections & auditory development 27 weeks and beyond
- Better neurodevelopmental outcomes to last a lifetime
- Fewer spells
- Parents are more likely to read after discharge
- Reassure patients of parents present
- Improve parent engagement and empower them to take responsibility for an aspect of their child’s development
- Reduce parent stress
- Auditory exposure for patients

What is cognitive nutrition? Language-rich interactions are integral to a child’s brain development just like food is integral to their physical growth

<table>
<thead>
<tr>
<th>How long should you read to your patients?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational Age</td>
</tr>
<tr>
<td>Max reading time / hour</td>
</tr>
<tr>
<td>Max reading time / day</td>
</tr>
</tbody>
</table>
Positioning

- Individualized needs
- Tucked and flexed with 360° of containment
- Supportive positioning products
### Infant Feeding

#### Pre-Feeding

<table>
<thead>
<tr>
<th>Touch</th>
<th>Smell</th>
<th>Taste: Initiate if baby is rooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin to skin with parents</td>
<td>Held skin to skin by mother</td>
<td>Nuzzling at pumped breast</td>
</tr>
<tr>
<td>Held by caregiver</td>
<td>Breast milk on baby’s fingers with hands to face</td>
<td>Breast milk on baby’s fingers or pacifier with hands to mouth</td>
</tr>
<tr>
<td>Hands to face &amp; mouth</td>
<td>Breast milk on upper lip</td>
<td>Colostrum with oral cares</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drops of milk</td>
</tr>
</tbody>
</table>
Family Partnership

- Participation
- Family Centered
- Provide Support
- Family Environment
- Skin-to-Skin

A Premature Baby has Premature Parents
WHAT INTERVENTION IS THE FRAMEWORK OF NEUROPROTECTIVE CARE?
SKIN-TO-SKIN
### Color System Guidelines

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
<th>Definitions</th>
</tr>
</thead>
</table>
| **Green:** | Infant can be held S2S | 1. PICC line/Peripheral IV  
2. Bronch  
3. Nasal Cannula/IO Cannula/High-Flow Cannula  
4. NIV/CPAP  
5. Conventional or Jet Ventilator (RT and/or 2+ nursing staff to be in room for transition)  
6. Apnea/Brady spells that are baseline for patient |
| **Yellow:** | Infants may participate in S2S holding after discussion with care team | 1. Significant ventilator support changes or requiring high levels of FiO2 to maintain oxygen saturation  
2. Phototherapy  
3. Postoperative surgical concerns  
4. They are having new onset, unexplained or significantly more than baseline apnea/brady spells/diuresis that are requiring intervention  
5. Stable medication drips (morphine, milrinone, prostaglandin)  
6. UVC lines  
7. 7+ ECG & EEG |
| **Red:** | STS care should be delayed for your baby at this time. Hand swaddling is appropriate for your baby. | 1. IVC, Femoral line, or other arterial line  
2. Oscillator  
3. Unstable PHMI/Stress Precautions  
4. Unstable chest tube  
5. ECMO  
6. Infant under the flat and midline protocol  
7. Parental constraints  
8. Critical Status or other conditions determined by LP  
9. Vasopressor/paralytic (dopamine, dobut, vec, op, nor, vec, nor) |

### Eligibility Color Guidelines

<table>
<thead>
<tr>
<th>Color</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green</strong></td>
<td>Infant can be held S2S</td>
</tr>
<tr>
<td><strong>Yellow</strong></td>
<td>Infants may participate in S2S holding after discussion with care team</td>
</tr>
<tr>
<td><strong>Red</strong></td>
<td>S2S care should be delayed for your baby at this time. Hand swaddling is appropriate for your baby</td>
</tr>
</tbody>
</table>
Trauma Informed Care Core Measures

- Healing Environment
- Protected Sleep
- Pain & Stress
- Activities of Daily Living
- Compassionate Collaborative Relationships
### 8 Attributes of Trauma Informed Professionals

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledgeable</td>
<td>The learner will understand all ways of knowing that inform a deeper awareness of not only self but also the lived experience of others</td>
</tr>
<tr>
<td>Healing Intention</td>
<td>The learner will integrate and apply Jean Watson’s 10 caritas processes into his/her personal and professional life</td>
</tr>
<tr>
<td>Personal Wholeness</td>
<td>The learner will adopt habits that support personal wholeness and well-being</td>
</tr>
<tr>
<td>Courage</td>
<td>The learner will prioritize one’s noble purpose and discover the strength and courage that lies within</td>
</tr>
<tr>
<td>Advocacy</td>
<td>The learner will recognize opportunities to advocate for self and others respectfully and knowledgeably</td>
</tr>
<tr>
<td>Role Model / Mentor</td>
<td>The learner will integrate the qualities of humility and empathy as a role model and mentor to inspire others to greater success</td>
</tr>
<tr>
<td>Scholarly</td>
<td>The learner will demonstrate a devotion to learning and consistently share new knowledge willingly and respectfully across a variety of platforms</td>
</tr>
<tr>
<td>Leader for Change</td>
<td>The learner will become a confident respectful leader for change both formally and informally</td>
</tr>
</tbody>
</table>
Healing Intention

• Connection
• Loving-Kindness
• Being Authentically Present
• Developing Trusting & Caring Relationships
Healing Intention - Connection

- Lean In
- Fun
- Midwest Nice
- Respect
- Compassion
Healing Intention – Loving Kindness

O: Observe
A: Act
R: Recognize
Healing Intention – Developing Trusting & Caring Relationships

- TRUST
- KINDNESS
- AUTHENTIC
Personal Wholeness

1. Meditation
2. Environment
3. Nutrition
4. Movement
5. Nature
6. Mind
7. Rest
8. Creativity
9. Service
10. Gratitude
Courage
Leader for Change

What is BOUNDARY

Be aware
Of what is
Unacceptable and
Normalize saying no.
Do what is best for you
And know that it’s not your
Responsibility to sacrifice
Yourself for others

OurMindfulLife.com
They saw "something" on her mammogram.

https://www.youtube.com/watch?v=cDDWvj_q-o8
What are your next 3 small steps?

“Anxiety and excitement are the same feelings...Just a different mindset.”
THANK YOU

Marissa L. Johnson, MSN, RN, CNL, RNC-LRN, TIP
Systems Manager – SFCH Quality and Patient Safety
Children and Women’s Services | Inpatient Services
University of Iowa Health Care | University of Iowa Stead
Family Children’s Hospital
200 Hawkins Dr. SFCH 2-22130-L | Iowa City, IA 52242
319-678-8981| Voalte 319-678-3420 | pager 6537
marissa-johnson-1@uiowa.edu

→ uichildrens.org
References


- University of Iowa Stead Family Children’s Hospital (2018). Care of the Extreme Low Birth Weight (ELBW) Infants (for infants <26 weeks gestation and/or ≤ 1000 grams) DN. P.CWS.02.012. Retrieved from: Care of the Extreme Low Birth Weight (ELBW) Infant (for infants 26 weeks gestation and/or 1000 grams) v.3 (policytech.com)


- University of Iowa Stead Family Children’s Hospital (2019). Guidelines for the Use of Vitamin A in the NICU. Retrieved from: Home - Neonatology Clinical Practice Guidelines (uiowa.edu)


- University of Iowa Stead Family Children’s Hospital (2021). Neuroprotective Care for the Premature and Term Infant DN.P.CWS.02.030. Retrieved from: Neuroprotective Care for the Premature and Term Infant v.9 (policytech.com)

References


• Caring Essentials. SURGE Masterclass.

• Caring Essentials. Trauma Informed Professional Program.