

# NeuroScience Nursing! Easy – Fun and More important than you think

DaiWai M. Olson PhD RN CCRN  
Assistant Professor of Medicine/Neurology  
Duke University Medical Center

## Miss Julie

- 63 y.o. AA female
- 5 year hx – lung CA
  - Jehovah's Witness
  - Refused radiation, chemo
- New Lung “lesion” x 2 months
  - Hemoptysis x 2 days
  - Chest CT (afterwards = pain and hemoptysis worse)
- Admit to oncology “chest pain and SOB”
  - DNR / DNI
    - “I discussed this with her and she was adamant that she did not want life support. “. . . .” I further discussed with her about **short term ventilation** and she was open to this discussion.”

## Miss Julie

- 4 a.m. = CODE BLUE
  - Morphine & NTG for pain
    - Drop BP – drop O2 sats – asystole - ?seizure?
      - Chest compressions & 2 amps epinephrine
      - ~90 second code w/ return of consciousness
- TX to Neuro (seizures)
  - En route respiratory decompensation
    - “At this time, I spoke directly with her at this time and she agreed to intubation. Family also agreed to this plan.”
- 5 a.m. = Intubated
- 7 a.m. = my shift

## Miss Julie - ICU day 3

- 3 p.m. – transfer orders – on bedpan
  - Asystole – seizure
  - Quick response – ventilation/compressions
    - “Asystole was likely due to vagal response . . She needs a pacemaker. . .”
- 8 p.m. – repeat chest CT
- 10 p.m. – re-intubated

The ends justified the means ! Everything worked out okay.

## Miss Julie

- 8 a.m. “I want the tube out . . . I want to go  
....**home** . . .”

Decision made – all in agreement (family/MD) –  
(nobody asked the nurse)

Julie writes “**what is going to happen?**”  
- we are going to take the breathing tube out

“ . . .and then ? . . .”  
you will die

“**how long will it take?**”  
I don’t know for sure, maybe  
hours . . .

“**I don’t want it to be in pain anymore**”  
I promise to care for  
you

## Midwives

probably first recorded “nurse” in  
global history

- To improve the process of childbirth and reduce infant mortality, the Greek elite would often pay for a woman to attend the expecting mother.
- This same person may have been called into service to care for (nurse) the infant in cases where the mother died during childbirth.

## Hygeia – Goddess of health

Daughter of Asclepius  
the God of Medicine

## Nosocomial

- Nosocomial = “hospital acquired”  
*Acquired from the ‘nosocomii’*
- ❖ the nosocomii were men who were educated by physicians and required to learn run the nosocomia (hospital)

## First Nurse in the U.S.

*( although it was not the U.S. yet )*

- Friar **Juan de Mena** is recognized 'by some' as the first nurse in what is now the USA. He was shipwrecked off the south Texas coast
  - Nurse in Santa Domingo Mexico
  - Killed (shot by an arrow) and died after shipwreck
    - 'could've used a second nurse!'

## Battlefield – Organized War

- War changes medicine
- 1851 – 1856 = Crimean war  
1861 – 1865 = Civil War

## Crimean War / Civil War



- Crimean – 1851 to 1856
  - The lady with the lamp
    - Florence Nightingale “we are a science”
- Civil – 1861 to 1865
  - Angels of the battlefield *(up to 8,000 volunteers)*
    - Dorthea Dix – superintendent of the Union Army
    - Mary Todd Lincoln - (yes, wife of president Lincoln)
    - Clara Barton – Founder of the American Red

## Linda Richards

- Born in 1841
- Took care of 'dad' 'mom' 'grandpa' 'husband' as they died (she was 13 – 27)
- She worked as a nurse (but didn't like it)
- Enrolled in a NEW course at New England Hospital for Women and Children (under Dr. Susan Dimoch [zurich])
- First to graduate as a Nurse with Diploma
- Went to Bellvue Hospital and created a new system to chart and maintain individual patient records.
- Died in 1930 at the age of 88 (stroke)

## NC – first in nursing

- The first State in the U.S.A. to require nursing licensure and first state Board of Nursing. (1903)



## Nursing Evolves Again

- Dec 6, 1941
  - <1,000 nurses in the Army Nurse Corps
  - 0 nurses near battle lines
- D-Day
  - 59,000 nurses have enlisted
    - Open to race and religion
  - Nurses are on front lines
  - Nurses have command positions in Army/Navy

## Certifications (N=195)

- AAS - Associate of Applied Science
- AAN - Associate of Arts in Nursing
- ACLS - [Advanced Cardiac Life Support](#) (not intended for postnominal use)
- ACNP-BC - Acute Care Nurse Practitioner-Board Certified
- ACNPC - Acute Care Nurse Practitioner Certification
- ACRN - AIDS Certified Registered Nurse
- ADLS - Advanced Disaster Life Support
- ADN - [Associate Degree in Nursing](#)
- ALNC - Advanced Legal Nurse Consultant
- ANP-BC - Adult Nurse Practitioner-Board Certified
- AOCN - [Advanced Oncology Certified Nurse](#)
- AOCNP - [Advanced Oncology Certified Nurse Practitioner](#)
- AOCNS - [Advanced Oncology Certified Clinical Nurse Specialist](#)
- APHN-BC - Advanced Public Health Nurse-Board Certified
- APN - [Advanced Practice Nurse](#)
- ARNP - Advanced Registered Nurse Practitioner
- .....
- WCC - Wound Care Certified

## Miami, FL – NCS - 2009

### Nursing Certification, Education and Experience Improve Sedation Management

Charles V. Stoner<sup>2</sup>, PharmD, BSN; Margaret E. Zomorodi<sup>1,2,4</sup>, PhD, RN; Suzanne M. Thoyre<sup>3</sup>, PhD, RN DaiWai M. Olson<sup>1,2</sup>, PhD, RN, CCRN  
<sup>1</sup>Dept of Medicine (Neurology), <sup>2</sup>Dept of Nursing, <sup>3</sup>Dept of Pharmacy – Duke University Medical Center, Durham, NC  
<sup>4</sup>School of Nursing – UNC – Chapel Hill, Chapel Hill, NC

**Abstract**

**Background and Significance:** Sedation assessment and monitoring in the critical care setting is the purview of the bedside staff nurse. Sedation management in the ICU often relies on subjective assessment by the nurse, and limited research has been conducted examining the characteristics of the nurse completing these assessments. The increasing focus on sedation assessments in the literature and the diversity of nurses in critical care units warrants further investigation of this topic.

**Methods:** This prospective randomized study explored demographic and educational characteristics of 63 nurses working in neurocritical care (NCU). The nurse data was given to patient data for 530 hours of continuous ICU care. Nurse data included degree, specialty certification, years of experience and likelihood of adopting new innovations. Patients were randomized to receive sedation assessment using either the Ramsay Scale or the Bispectral Index (BIS) monitored by their sedation assessments. Patient data included baseline demographic and total volume of propofol infused during the period of mechanical ventilation.

**Results:** 60% of 63 nurses used the Ramsay Scale for patient weight and propofol assessment, certified nurses (CCRN, CNS) used significantly more propofol (median 19.7 mL versus 18.5 mL; p = .001). The highest level of education was a significant predictor of propofol use (median): ADN nurses (21.8 mL), BSN nurses (17.2 mL), MSN nurses (14.9 mL) and PhD nurses (12.1 mL). Multivariate regression models demonstrated that years of nursing experience and critical care experience were significant (p < .001) for predicting sedation use (greater experience = less sedation).

**Conclusions:** The contribution of individual nurses is important and measurable. These data provide solid evidence that nursing certification and educational patient treatment outcomes. Nurses with higher educational degrees, specialty certifications, and increased experience use less sedation. Specialty certification and more experience used significantly less sedation than their counterparts with no difference in assessment events outcome. This study highlights the need to include nursing variables in future research exploring interventions in critical care.

**Key Definitions**

**Education** = the highest educational degree obtained by the nurse at the time of the study

**Adoption** = the likelihood of adopting a new innovation (measured by self report) based on Zager's theory of Diffusion of Innovations

**Certification** = includes all forms of nursing certification (e.g. CCRN, CNS, etc)

**Results**

**Highest Degree Obtained**

The highest level of education was a significant predictor of mean propofol use (mL/hr): ACNP/BC nurses: 21.8 mL/hr, BSN nurses: 17.2 mL/hr, MSN nurses: 14.9 mL/hr, and PhD nurses: 12.1 mL/hr.

**Highest Degree vs. Total Volume Propofol Infused**

**Figure 3: Certification vs. Total Volume Propofol Infused**

**Table 4: Adoption vs. Highest Degree**

**Conclusions**

1. Nursing certification and education impact patient outcomes.
2. Nurses with higher educational degrees, specialty certifications, and increased experience use less sedation.
3. Nurses with lower levels of education rated themselves as less likely to adopt new innovations.
4. Future studies exploring the impact of sedation management strategies should not assume that the intervention is stable across each individual nurse.
5. Additional studies are required to assess the full impact of individual nursing characteristics on neurocritical interventions.

## Suarez (2006) *Critical Care Medicine*

The Introduction of neurointensivists  
and neurocritical care units has  
changed hospital mortality.

*MD + Neurology + Anesthesiology + Critical care = Neurointensivist*

It is not just nursing and nurses who are  
driving the move towards specialization

Primary Care — Will It Survive?  
Thomas Bodenheimer, M.D.  
N Engl J Med 2006; 355:861-864

## Competence and certification of registered nurses and safety of patients in intensive care units.

2009

Am. J. Crit. Care: 18(2)

Data from 48 ICUs from 29 hospitals

- Proportion of Certified RNs was inversely related to the number of falls\*
- RN experience was inversely related to UTIs\*

### Conclusion

***Specialty certification and competence  
are related to patient safety***

\*Not all the results reported on this slide

## Does education matter ?

Aiken, L. H.,  
Clarke, S. P., Cheung, R. B., Sloane, D. M., & Silber, J. H.  
(2003)  
Educational levels of hospital nurses and surgical patient  
mortality.  
*JAMA*, 290(12), 1617-1623.

After adjusting for patient characteristics and hospital structural characteristics (size, teaching status, level of technology), as well as for nurse staffing, nurse experience, and whether the patient's surgeon was board certified, a 10% increase **in the proportion of nurses holding a bachelor's degree was associated with a 5% decrease in** both the likelihood of patients **dying** within 30 days of admission and the odds of **failure to rescue**

## Certification and Administration

- Valente. 2010. J Nurses Staff Dev. 26(5). Improving professional practice through certification
- positive correlation with
  - Retention, Patient satisfaction, nurse satisfaction
- Certified nurses are valued by the hospital and by the patient-family dyad.

## Does Nursing Research Matter?

- Olson DM, Thoyre SM, Turner DA, Bennett S, Graffagnino C. Changes in intracranial pressure associated with chest physiotherapy. *Neurocrit Care*. 2007;6(2):100-103.
- Olson DM, Thoyre SM, Bennett SN, Stoner JB, Graffagnino C. Effect of mechanical chest percussion on intracranial pressure: a pilot study. *Am J Crit Care*. Jul 2009;18(4):330-335.
- Olson DM, Bader MK, Dennis C, Mahanes D, Riemen K. (2010). Multicenter pilot study: Safety of automated chest percussion in patients at risk for intracranial hypertension. *Journal of Neuroscience Nursing*. 42(3):119-127.

## Mary Ann Fuchs

“I don’t mind paying them (certified nurses) more... ..in fact, if all my nurses were CN 4, I wouldn’t have to worry about the budget.”

*Dr. Mary Ann Fuchs RN DNP*

## What does certification mean to patients & family?

## What does Certification mean to you?

You go home today and find that your sister called... she lives in Chicago and her 2 year old has Dilated Cardiomyopathy - The child will need a heart transplant before the age of 3.

She is distraught and must select a transplant surgeon.

--- She can not make a decision and wants your advice on one of the two Docs one certified – the other not.

## Certification makes a difference

**It makes a difference to your patients**

**It makes a difference to your families**

**It makes a difference to your colleagues**

**It makes a difference to your boss**

*- And -*

**It makes a difference to ME**