Where Have We Been and Where Are We Going?

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The speaker has signed a disclosure statement indicating that she has no significant financial interest or relationship with the companies or the manufacturer(s) of any commercial product and/or service that will be discussed as part of this presentation.

Session Summary
This presentation will include a brief look at the history of neonatology and neonatal nursing, will examine current trends in health care, and will attempt to examine what the future of neonatal care might look like. Topics will include clinical advances, a global look at neonatal outcomes, and a look at changes in the health care system in the United States.

Session Objectives
Upon completion of this presentation, the participant will be able to:

▪ discuss the history of neonatology and of the NNP role;
▪ discuss the potential for growth in neonatology and in the NNP role.

References*


*Additional references and website resources can be found throughout the presentation.
Where have we been....where are we going? A talk about nothing...and everything

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Neonatal Nurse Practitioner

History of NICU Design

• I recommend: http://neonatology.org/history/history.html


Pre NICU Era

• London Dispensary for the Infant Poor 1769

A new classification of the eras of Neonatal Care
Created by Linda Frank (Presented at COINN, 2016) with permission.

• Based not on the technology available, but on the environment of care and partnerships between parents and the health care team.

• The Neo-lithic: 1870-1930 The age of sideshows
• The Neo-nanny Age: 1930-1965 aka the Age of Exclusion
• The Neo-Technic Age: 1965-1985 aka the Grand Uncontrolled Experiment
  • Mechanical ventilation, parenteral nutrition, respiratory support, surgery, IATROGENIC disease
• The Neo-Aquarius: 1985-present aka the age of enlightenment
  • Recognition of family iatrogenia, infant communication skills, family contribution to infant outcomes
  • Birth of “environmental” neonatology, FCC movement, individualized or precision medicine.

Turn of the Century
Dr. Couney, Coney Island (Neo-lithic)

Harlem Hospital New York, circa 1940 (Neo-nanny)

“A corner of the newborn nursery kept at 80° F. Note the electrically heated bassinet; incubators kept in Fowler position. Each infant is supplied with its own table containing all necessary utensils. The infant does not leave this unit until it is ‘graduated’ to the second unit which is kept at 72° F. for heavier infants.”
A busy few years

- 1941 discovery of Rh factor, 1947 first report of an exchange transfusion
- 1941 first clinical recognition of RLF (retrolental fibroplasia), 1952 would be linked with the use of oxygen
- First successful primary repair of TEF
- 1944 Description of “malignant enteritis of the first three months of life”
- 1952 Apgar Scoring (Virginia Apgar)
- 1953 Description of natural history of RDS and a description of sternal traction for RDS
- 1957 commercial production of a winged scalp vein needle for neonates
- 1957 introduction of thalidomide in Europe, 1960 linked to birth defects
- 1959 First report of UAC for arterial sampling, IV fluids for RDS
- 1963 First successful ventilation of a newborn for RDS

Dr. Gluck

- Prior to the 1960’s premature infants frequently placed in a corner or isolated from other infants.
- Dr. Gluck did early studies that showed that other infants didn’t make premature babies sick, Unwashed hands of the adults around them did. (Staph)
- The open bay NICU was born so that caregivers could see the infants they cared for...

Michael Reese Hospital 1958

- http://www.nicuawareness.org/blog/a-brief-history-of-advances-in-neonatal-care

The “First” Modern NICU

- October 1960, Yale New Haven
- Another first...........
  - I can’t find a single picture used for promotion!
The “first” Modern NICU
Stahlman, 1961

Note that “the first” depends on where you work.

1963 A sitting president loses a child to prematurity and respiratory distress (35 ½ weeks gestation and 2.11 Kg)
1970’s Newborn Individualized Developmental Care and Assessment Program was developed by Heidelise Als. Fathers became non visitors http://www.nicuawareness.org/blog/a-brief-history-of-advances-in-neonatal-care
1975 the American Board of Pediatrics established sub-board certification for neonatology
1976 Controlled trial TPN in NB

1980 (Neo-technic)

1980’s Continuous light, noise, limited family visitation

Yes, that is me. I was 20, I couldn’t buy a drink, but I was taking care of critically ill newborns...

The term Point of Care had not yet been thought of, but......

• Urine specific gravity and dipstick
• Guaiac
• Icto test
• Spin a “crit”
• Taped a tube of blood to the incubator to see if lipids floated up?
• Dextrostick – chemstrip-accucheck-
Monitors looked like boat anchors

The NICU’s of the 1990’s-2000’s

2000’s Single Room Care
(Neo-Aquarius)

2010’s the era of
Family Centered Care

The NICU of the (near)
Future

• Families stay with us?
• It is already happening
  • Sweden, Estonia, trials in Canada
• Parent experts?
• Nurse as a consultant?
• Glass that becomes opaque?
• The “Green” NICU?

Fundamental Questions:
NNP’s Where did we come from?
The wind up

- 1965: Dr. Loretta Ford (Public Health Nurse) and Dr. Henry Silver (Pediatrician) develop the first PNP program at the University of Colorado.
  [Source: http://www.ipedsnursing.org/ptisite/campaign/lorettaford]

- 1960-1970: Most units functioned with one supervising "neonatologist" (Pediatrician who was interested in Neonatology) and a team of medical interns and residents.
- Early regionalization
- Neonatology fellowships, No board until 1975
- 1970's: Shortage of caregivers exacerbated by restrictions of resident hours in NICU

Blue Ribbon Commission

- Variety of concerned professional organizations
- 1974: Guidelines for Short-Term Continuing Education Programs for the Nurse Clinician in Intensive Neonatal Care and the Nurse Clinician in Intensive Maternal-Fetal Care. Published by ANA in 1975.
- Term "clinician" differentiated from the CNS.

The First Pilot Demonstration

- Patricia J. Johnson, graduate student
- Dr. August "Larry" Jung, University of Utah Intermountain NICU
- Test feasibility of an APN role in this environment
- Worked as a peer with residents and maintained the traditional resident schedule (7 days a week and in-house call every third night)
- Charts were blinded and evaluated by 10 of the leading neo's in the Western US. Results published in 1979.

NPN Programs

- Most early programs were 4-9 months in length and hospital based. Largely unregulated.
- As late as the 1990's, more than 2/3 of NNP's were certificate trained (Johnson, 2002).
- A few of these providers remain in practice and it severely limits their mobility.
- Organized medicine not supportive of the role of NPs.
- Trend toward Graduate level training.
- 1983: A group of NNC/NNP's the first Neonatal Nurse Clinician, Practitioner and Specialist conference in Denver.
  - 15 member task force to address issues
  - 1985 affiliation with NANN (National Association of Neonatal Nurses).

- 1983 Certification for NNCPS by NAACOG Certification Corporation......Now the NCC.

- 1984 Survey
  - The age of the average NNP was increasing
  - Various titles still in use
  - NNP becoming more prevalent in Level III settings
  - Moving toward graduate level education
  - Few respondents had salaries exceeding $35,000 per year
  - Job satisfaction: autonomy
  - Job dissatisfaction: Limited upward mobility and lack of continuing education...

  [Shortened from Johnson, 2002]
1980's Mary Beth Bodin: touch study

FANNP: 1989

1992
• Tami becomes an NNP
• In a state with no title recognition and no defined role....

1992
• 1990's Attaining Provider Status:
  • Recognition that NPs could provide lower cost, quality services
  • The price for provider status was regulations
    • Credentialing, privileging
    • Prescribing and DEA
• 2000's Graduate education as entry into practice. Expansion of the role to recognize the many contributions of the NNP...Educator, preceptor, mentor, advocate, research, QI, thought leader

2007
• NANN and Robin Bissinger

Another Crisis 2010's
• NNP shortage
  • NANNP workforce survey 2014
  • Growing shortage
  • Graduation rates stagnant
  • NNP jobs being filled by other professions
• NNP Education
  • To DNP or not to DNP, that is the question
  • Representing our profession
Where are we going?

Our Profession

• A profession is a vocation founded upon specialized educational training, the purpose of which is to supply disinterested objective counsel and service to others, for a direct and definite compensation, wholly apart from expectation of other business gain. (Wikipedia, retrieved 7/2017)

Maturing specialty (gathered from multiple places)

• Profession
  • Professionals, Knowledge, professional practice
• Hallmarks of a maturing profession
  • Initial Professional Education
  • Accreditation
  • Skills development
  • Certification
  • Licensing
  • Professional Development
  • Code of Ethics
  • Professional society

Infographics on the NNP

• https://infogram.com/3be0c4b3-19fa-4d9a-a888-17f66b77d302
  Hyebin Lee SNNP
  • Aylin Lopez SNNP
SWOT analysis

**Strengths**
- Established knowledge, success, utility
- Established education systems
- Long history of role/quality
- Evidence demonstrating outcomes and cost (multiple authors)
- AAP endorsement – NANNP position Statement
- Both Acute care and Primary care certified
- Established education systems
- National Association with advocacy arm
- Separate consensus model population
- 2017 USNWR ranked NP #2 for best job (all NPs, not specifically NNP)  
  https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs

**Weaknesses**
- Small numbers (just over 5000 and only a small percentage of all NPs)
- Poor engagement
- Scope of shortage
- Others assuming our roles (PAs, Hospitalists, other NPs, Neos)
- Entrance into programs stagnant (except !)
- Attitude
- Inconsistent roles

**Opportunities**
- Growing populations
- Upcoming shortage of Neo’s ?
- Scope of practice thru 2 years
- Caring for patients outside of NICU
- Fellowship development
- Neonatal Faculty Organization
- Increasing gender diversity

**Threats**
- Inclusion in pediatrics and loss of identity
- Aging workforce
- Barriers to practice (both in law and in organizational limits on practice)
- Unstable programs (education programs of convenience, non traditional student)
- Healthcare financing

The NICU and the Care we Give
Technology

- Technology keeps marching on.
- https://www.youtube.com/watch?v=ZVe6GT9d3o&t=11s
- FDA News Release
  FDA clears first neonatal magnetic resonance imaging device
  The Embrace Neonatal MRI System is contraindicated for patients weighing more than 4.5 kilograms or with a head circumference of more than 38 centimeters

The NICU: current trends

- Increasing need for QI
- Public, payors, families looking at our outcomes
- Public, lay news sources are reporting our outcomes: http://health.usnews.com/best-hospitals/pediatric-rankings/neonatal-care
- Explosion of data about us, our patients
- Meta data

Addressing Public Health Issues in the NICU

- Family issues
- Infant morbidity
  - Vaccines
  - Breastfeeding
  - Parenting
    - Shaken baby
  - Infant mortality
  - Second Hand Smoke
  - Smoking cessation for mothers/families
  - Levels of care surveys
    - Importance of risk appropriate care
    - Example: Texas rules
  - Back to Sleep

When will we learn?

- Increasing recognition of iatrogenic harm
- When will we learn?
- Looking forward rather than looking back

Greater recognition of iatrogenic harm

- Neonatal inflammatory pain may contribute to increased food consumption, obesity in females (at least in rats, Georgia State University and Charlie Norwood VA center)
  http://news.gsu.edu/2017/07/05/early-life-pain/
- Microbiome
- Neurodevelopment
  - Work of T Inder and others.
Answers to age old questions

- Newborn infant girls have better outcomes than their male counterparts due to an innate genetic advantage in responding to acute infections, according to new research from RCSI (Royal College of Surgeons in Ireland). [http://www.news-medical.net/news/20170526/Innate-genetic-advantage-contributes-to-better-outcomes-in-newborn-infant-girls-than-boys-research-shows.aspx](http://www.news-medical.net/news/20170526/Innate-genetic-advantage-contributes-to-better-outcomes-in-newborn-infant-girls-than-boys-research-shows.aspx)

NICU: Subspecialization

- Continued subspecialization
  - As the care we give becomes more specialized, so do the people
    - ECMO-ologists, neonatal pulmonologists, neonatal surgeon?
    - Small baby nurse?, Transport nurse? Palliative care nurse?
    - Delivery teams?
  - Continued widening of the gap between level II and level III/IV care
    - Are we at risk for multiple standards of care? ……

NICU: Finding the Sweet Spot

- Standardization/protocols versus individualized care/personalized care
  - Does it have to be a tug of war?

Agrowing trend towards “Choosing Wisely”


- Initial Paper suggested 5 opportunities
  - Used delphi methods to pick 5 opportunities from a total of 1648 candidate tests and 1222 treatments
  - Avoid routine use of antireflux medications, avoid antibiotics beyond 48 hours if culture neg, avoid use of pneumograms, avoid routine screening MRIs, avoid daily chest xrays just for intubation.
  - Is it time to move on?
    - We still have quite a few left and we are creating new ones

NICU: Family Involvement

- More
  - Google search: I quickly identified over 20 organizations
    - National programs:
      - [www.marchofdimes.org/complications/the-nicu-family-support-program.aspx](http://www.marchofdimes.org/complications/the-nicu-family-support-program.aspx)
      - [http://handtohold.org/](http://handtohold.org/)
    - Local Programs: [http://www.highriskhope.org/patient-resources/3?gclid=Cj0KCQjw5arMBRDzARIsAAqmJexExYmD2XbvsHkwCIygD0sSa37q1ylOLKwNn9R7r1dme2XalDA_nkz6E4Aw_wcB](http://www.highriskhope.org/patient-resources/3?gclid=Cj0KCQjw5arMBRDzARIsAAqmJexExYmD2XbvsHkwCIygD0sSa37q1ylOLKwNn9R7r1dme2XalDA_nkz6E4Aw_wcB)
    - Disease Specific Organizations:
      - [http://www.eatef.org/](http://www.eatef.org/)

NICU: Family Involvement

- [Family Involvement](#)
- [Family Centered Care](#)
- [Family Integrated Care](#)
NICU: Family Involvement

- Involvement in Quality: VON program
- Involvement in INC: https://c-path.org/programs/inc/
  - International consortium to accelerate the development of safe and effective therapies for neonates
- Involvement in Education
- Involvement in Units
- Involvement in Research

Research

- More collaboration
- INC: https://c-path.org/programs/inc/
  - International consortium to accelerate the development of safe and effective therapies for neonates
- Growing Multidisciplinary Research
- Funding?
  - NIH funding: increase or decrease?
  - Private funding:
    - Gates Foundation: Seattle cpap
      https://www.gatesfoundation.org/News-Center/Press-Releases/2017/07/Seattle-Childrens-Invention-Lands-Major-Funding-

Genetics and Biomarkers


Changes in how we see and manage Immune problems?

- Microbiome !!!!!!!
  - Antibiotic Stewardship, sepsis calculators, probiotics
  - Long term consequences of our actions
- Less antibiotics

Regenerative Medicine

- Repair, Replace, Restore, Regenerate
- Gene therapies
- Cystic fibrosis
- Stem Cells !
- Most of the work is still in animal models.....
  S0022347616312762-mano-epdf?_tid=6f6ff136-8d69-11e7-ba36-00000aacb361&acdnat=1504087144_98a1644403e901674e360a65809154b6

Changes in Payers/Payment and how it will effect the NICU

- Under development:
  - A period of cautious and conservative spending?
To Wrap up: