

FUTURE OF NEONATAL INTENSIVE CARE IN THE US – ROLE OF NNPS


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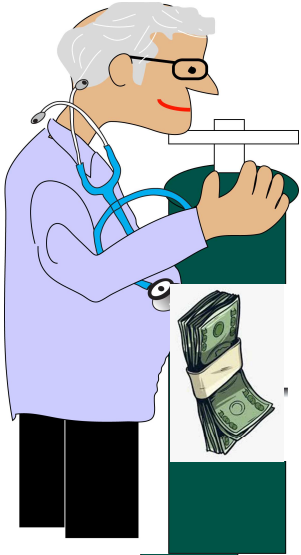
Objectives

- Identify three different NICU staffing models based on neonatal providers
- Define and the describe the components of RVUs
- Understand the impact of the changes in ACGME requirements on the NICU provider landscape
- Identify three threats to the NNP workforce

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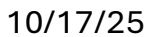
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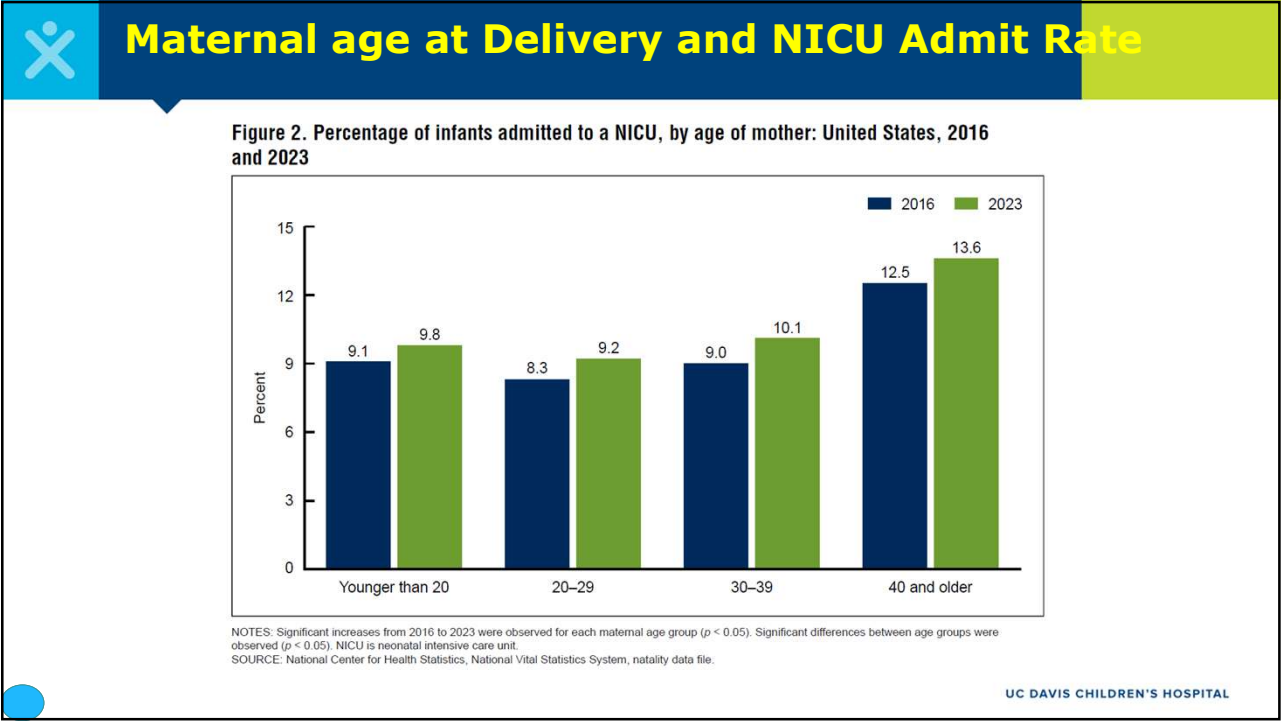
Current State of the Workforce

- **Declining birthrates:** National trends and impact on NICU census
- **Shifting admission patterns:** Fewer moderate/late preterm admissions; rise in medically complex neonates
- **NNP workforce demographics:**
 - Age distribution
 - Geographic disparities
 - Role distribution across Level II/III/IV NICUs
- **Staffing challenges:** Vacancies, turnover, salaries and recruitment barriers

Martin & Osterman, 2025
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- ### Changes in Clinical Care and Complexity
- **Increased survival of periviable and extremely preterm infants**
 - Ethical challenges and care planning
 - **Rise in chronic conditions:**
 - BPD, gastrostomies, long-term ventilation; Caring for infants past the initial neonatal period
 - **Family needs:**
 - Greater emphasis on care coordination and family education
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NICU: 1990's vs 2025

Slide courtesy: Dr. Guilherme Sant Anna, <guilherme.santanna@mcgill.ca> FANNP's National Neonatal Nurse Practitioner Symposium: Clinical Update and Review, 2025 ©


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✕ Financial Implications of Workforce Changes

- **Billing and reimbursement shifts:**
 - CMS coding and collaborative billing models, RVUs
 - Financial sustainability of 24/7 NNP coverage
- **Hospital hiring strategies:**
 - Cost comparisons between physicians, NNPs, and residents
 - Influence of bundled payments and value-based care
- **Potential threats:**
 - Role confusion with physician associates
 - Inadequate visibility of NNP value in cost-saving and outcomes

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Money - Sources


- **Provider fees**
 - Collected by a qualified health professional (QHP)
 - Based on each encounter
 - Diagnosis
 - Evaluation and Management (E & M)
 - Time spent
 - Complexity of decision-making
- **Facility fees**
 - Collected by the hospital or clinic
 - **Models:**
 - Daily payment (e.g., \$ 4,000 per day for moderately sick and \$ 6,000 per day for critical)
 - Diagnosis related group (DRG, DRG 790: extreme prematurity- a 23-week gestation preterm is paid \$ 250,000 if she survives)

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Physician Payments


Medical intervention (documented in EMR)



Dr. X performs a newborn resuscitation



Baby's diagnosis:
ICD 10
Medical intervention:
CPT code



P07.22

2024 ICD-10-CM Diagnosis Code **P07. 22**: Extreme immaturity of newborn, gestational age 23 completed weeks.

99465

To report the neonatal resuscitation code (**99465**), qualifying resuscitative efforts are required, which include bag-and-mask or bag-to-endotracheal tube ventilation (positive-pressure ventilation) with or without CPAP and/or cardiac compressions.

Journal of Perinatology

PERSPECTIVE **OPEN**

Controversies in CPT® coding in the neonatal intensive care unit: - critical vs. intensive care


Satyan Lakshminrusimha^{1,2,3,4}, Clara Song², Stephen A. Pearlman⁵, Gilbert Martin⁶ and Scott Duncan⁸

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What's an RVU?

CPT code	Description	wRVU
99464	Attendance at delivery	1.50
99465	Newborn resuscitation	2.93
99466	Ped crit care transport	4.79
99467	Ped crit care transport addl	2.40
99468	Neonate crit care initial	18.46
99469	Neonate crit care subsq	7.99
99471	Ped critical care initial	15.98
99472	Ped critical care subsq	7.99
99475	Ped crit care age 2-5 init	11.25
99476	Ped crit care age 2-5 subsq	6.75
99477	Init day hosp neonate care	7.00
99478	1c lbw inf < 1500 gm subsq	2.75
99479	1c lbw inf 1500-2500 g subsq	2.50
99480	1c inf pbw 2501-5000 g subsq	2.40

- Developed for and used by Medicare (CMS) as a rational way to standardize the valuation of (and payment for) physician work
- Adopted by most payers
- RVUs are widely used for physician benchmarking and compensation (especially in fee for service systems)

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	2025 PW GPCI (with 1.0 Floor)	2025 PE GPCI	2025 MP GPCI
Sacramento	1.034	1.156	0.560
San Francisco	1.088	1.419	0.470
San Jose	1.100	1.435	0.560

RVU Components

GPCI

X




Work

Provider's work including mental effort, decision-making, technical skills, stress and time

+

GPCI

X




Practice expense

Clinical and non-clinical labor costs and practice expenses

+

GPCI

X




Malpractice

Liability insurance costs

=


Relative Value Units

X



Conversion Factor (CF)

=



Geographic practice cost indices (GPCI)

99468	Neonate crit care initial	18.46
99469	Neonate crit care subsq	7.99

Medicaid (public insurance): e.g., \$ 44.27* (varies by state)

Commercial insurance: e.g., \$ 142.46* (varies by type)

*based on data from UC Davis Department of Pediatrics aggregate numbers for fiscal year 2024

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10/17/25

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Physician Payments

Journal of Perinatology

PERSPECTIVE
Controversies in CPT® coding in the neonatal intensive care unit: - critical vs. intensive care
Sagar Lakshminarayanan, Class Song, Stephen A. Harrison, Gilbert Martin, and Scott Duncan
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Medical intervention (documented in EMR)

Baby's diagnosis: ICD 10 Medical intervention: CPT code

Dr. X performs a newborn resuscitation

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To report the neonatal resuscitation code (99465), qualifying resuscitative efforts are required, which include bag-and-mask or bag-to-endotracheal tube ventilation (positive-pressure ventilation) with or without CPAP and/or cardiac compressions.

CPT code	Description	wRVU
99464	Attendance at delivery	1.50
99465	Newborn resuscitation	2.93

Geographic practice cost indices (GPCI)

Work Practice expense Malpractice

Relative Value Units

Conversion Factor (CF)

Conversion factor \$/RVU

P07.22

2024 ICD-10-CM Diagnosis Code P07.22: Extreme immaturity of newborn, gestational age 23 completed weeks.

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Physician Collections:

- Large difference in \$ / wRVU between Medicaid and Commercial
 - Two- to four-fold difference
- E.g., **conversion factor**: \$ 44.27 vs. \$ 142.46
- CPT code – 99204 (moderately complex visit)
 - wRVU assigned to this code – 2.6
 - Payment for this visit - \$ 115.10 (Medicaid) to \$ 370.40 (commercial)
- CPT code for neonatal critical care admission (99468)
 - wRVU assigned to this code – 18.46
 - Payment for first day of care - \$ 817.22 (Medicaid) to 2,629.81 (Commercial)


CPT Code	Description	Work RVU
99468	Initial inpatient neonatal critical care, per day, for evaluation and management of a critically ill neonate aged 28 days or younger	18.46
99469	Subsequent inpatient neonatal critical care, per day, for evaluation and management of a critically ill neonate aged 28 days or younger	7.99

RVU = relative value unit.

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Billing by Physician




Daily global code or procedures – if MD leads rounds and drive decision-making and documents or co-signs the note: MD billing provider (Common situation)


Billing by NNP



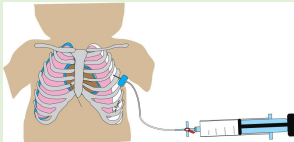
Delivery room attendance and resuscitation (without an attending physician)



Use of hourly critical care codes or other time-based codes and NNP is the QHP spends > ½ the time



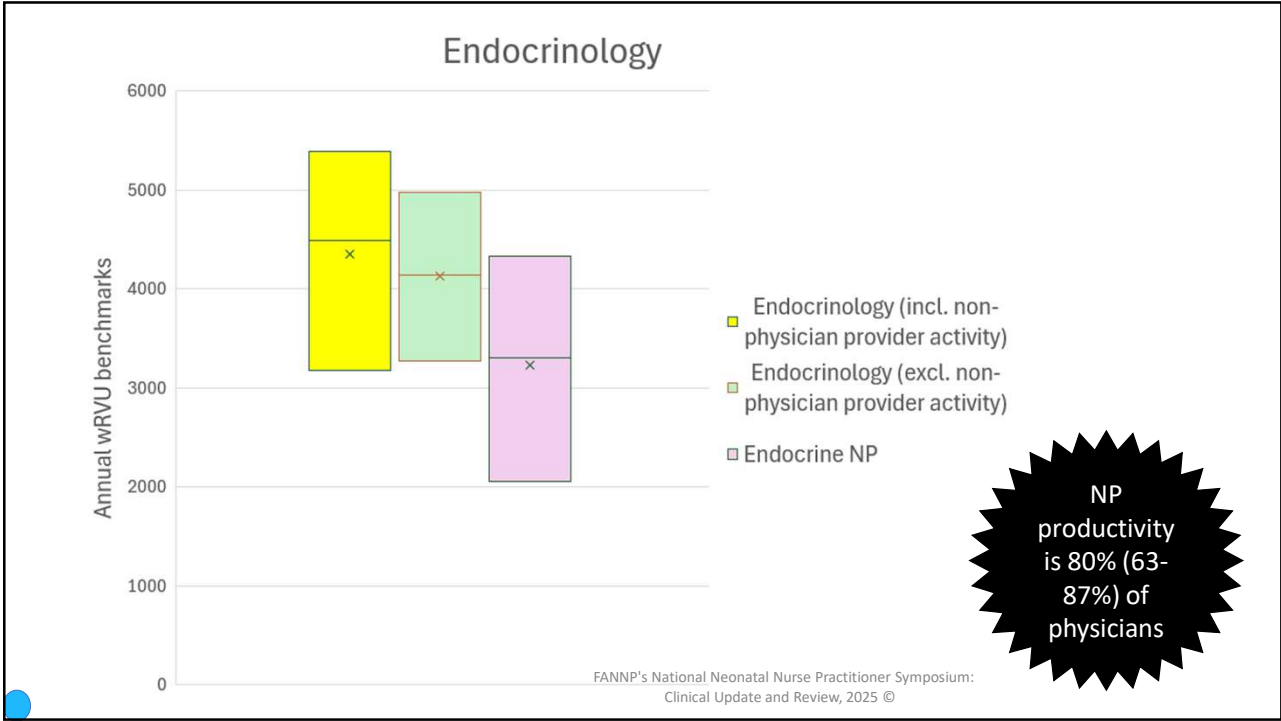
Daily global code – if NNP is the sole QHP (may be reimbursed ~ 85% or physician rates)



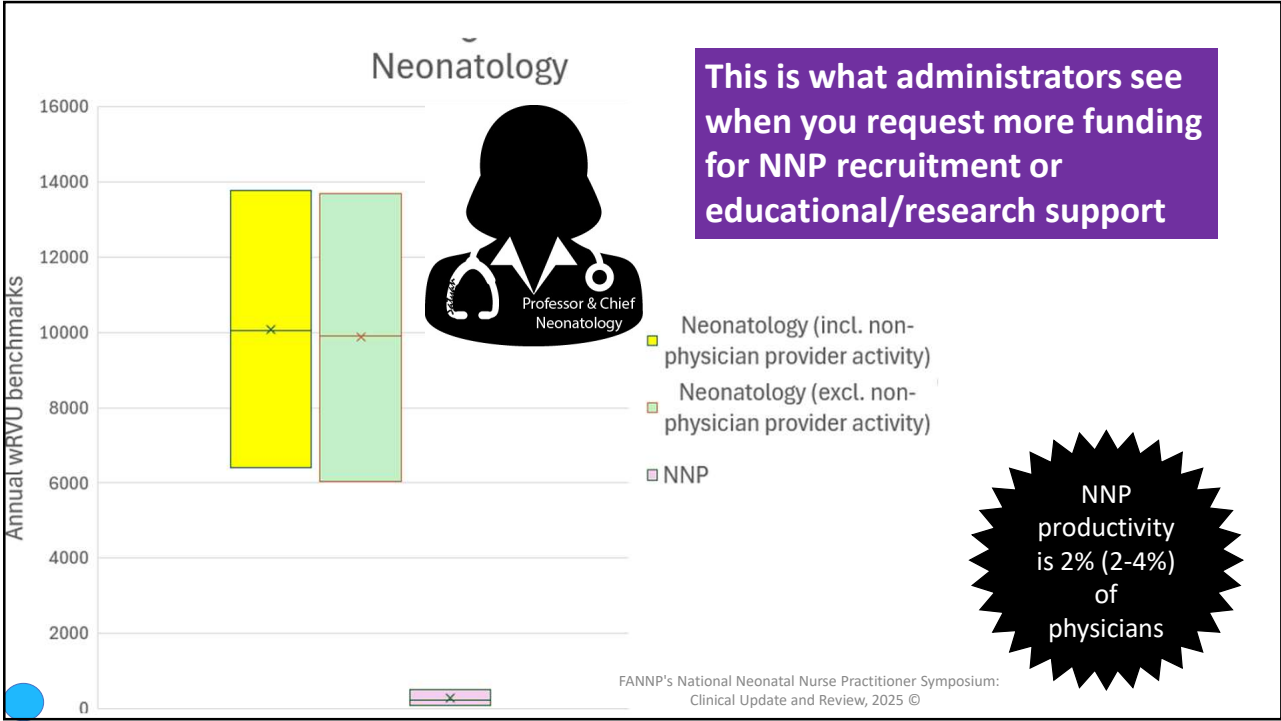
Procedures performed (no assisting or supervising physician) that are not part of daily, global code (e.g., thoracentesis)

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Staffing Models

- **Neonatologist only model**
 - Common in level 2 and some level 3 NICUs
 - No residents or advanced practice providers (APP)
 - Low acuity coverage ranges from 5-20 patients
 - High acuity: 5-8 patients
- **Neonatologist (academic) without APP**
 - Residents (and fellows)
 - 16 to 30 patients per neonatologist
 - 6 to 9 patients per resident
 - New guidelines from ACGME: reduced NICU rotations (minimum 4 weeks / 3 y-residency)
 - Residents work 5-6 shifts/week; 12h shifts

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Staffing Models with APP (more common)

- **Advanced Practice Providers (APP)**
 - Neonatal nurse practitioners (NNP)
 - Physician assistants (PA)
- **Neonatal hospitalists (pediatric residency +/- hospitalist fellowship)**
- **Neonatologist covers 16 to 30 patients and supervises:**
 - APP covering 6 to 9 patients each during day shift
 - Night shift: neonatologist covers the whole unit and APPs cover 20-30 patients
 - Daily notes is written by the daytime APP and attested by the neonatologist
 - APP typically works 40 hours per week (13 h shifts x 3)



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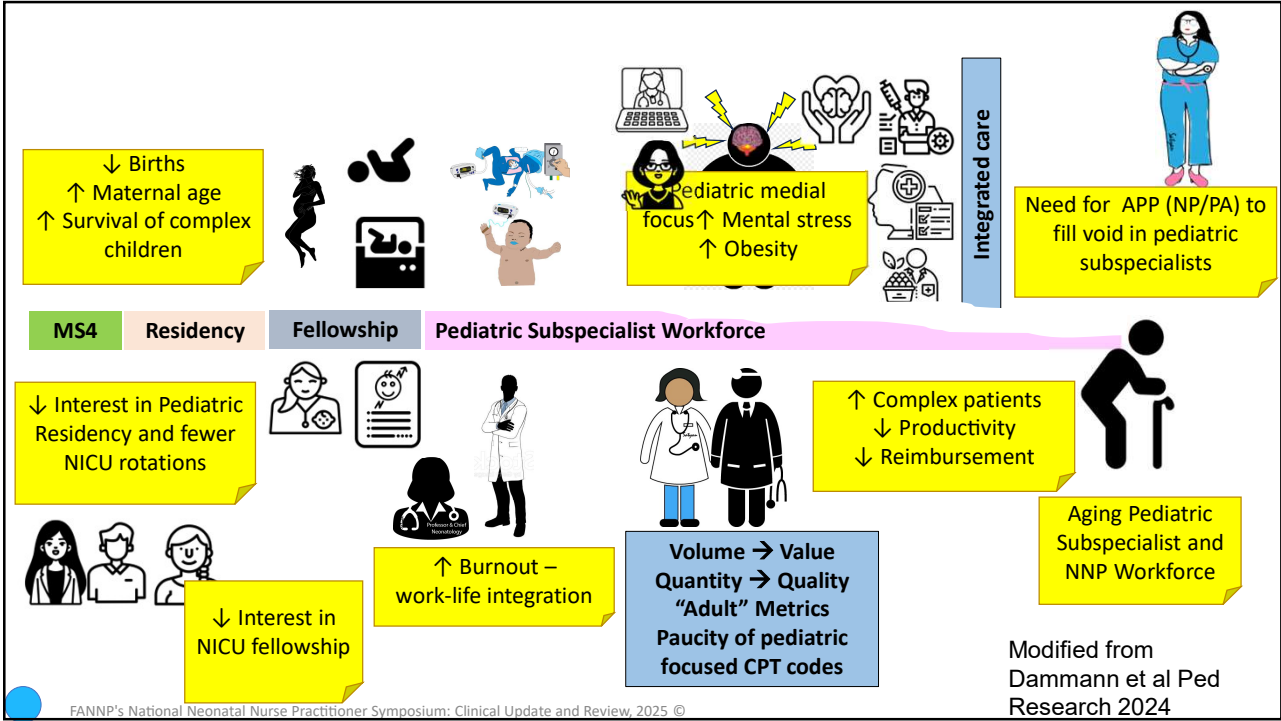
Changes in ACGME Requirements

- **Reduced NICU exposure for pediatric residents**
 - Impact on interprofessional collaboration
 - NNPs as continuity providers and gatekeepers of neonatal expertise, but also adds to their workload (more patients, hours, on top of teaching expectations)
- **Competency gaps in residents entering neonatology fellowships**
 - Opportunities for NNPs in education and procedural training

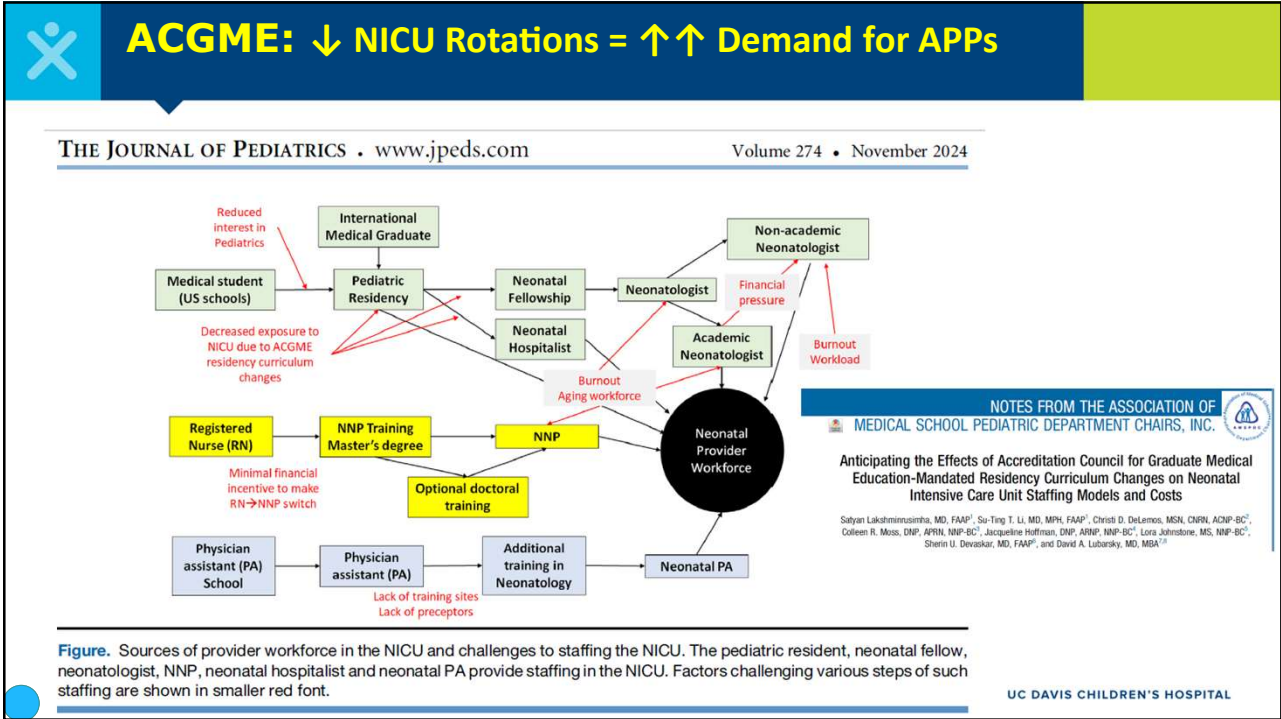


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Cost of APPs – Support from Health system

Table. Effect of ACGME proposed residency NICU staffing for a hypothetical program with 10 pediatric residents per year reducing their NICU rotation by 4 weeks

Workforce	Shifts/year	Comments
10 residents × 4 weeks × 6 shifts/week/3 years	$80 \times 3 = 240$ (30 residents in 3-year pediatric residency program)	10 residents in the program 30 residents in 3 years 4 weeks reduction over 3 years 6×13 -hour shifts per week
APP staffing – 3 shifts/week 40 weeks per year Calculator (assumes that APPs and residents carry equal number of patients per shift)*	120 (usually 12.5 to 13 hour shifts) Number of residents per year in the program = X Number of weeks of NICU service being reduced over a 3-year period = Y	2 NNP/PA FTE per 4-week reduction in NICU time over a 3-year period for a 10-resident/year program Number of APP clinical full time equivalent needed to staff this deficit = $(X \times Y / 20)$


*Medical centers and NICUs vary widely but we assumed that a dayshift resident or APP staffs a maximum of 9 patients of mixed acuity or 6 patients with high acuity and a night shift resident or APP staffs a maximum of 24 patients.

Cost of NNP: early career \$ 109,000/y; mid-career: \$ 134,000/year
West coast: higher




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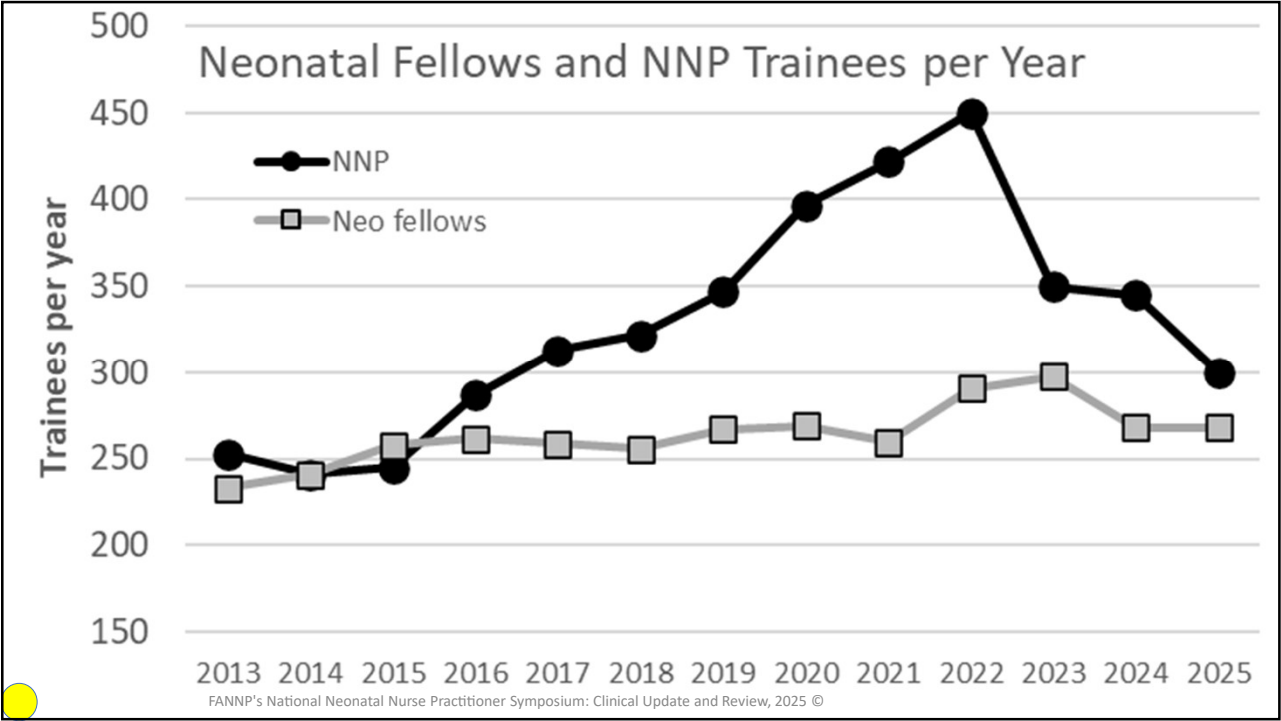
Current State of NNP Education

- **Enrollment trends:**
 - Decrease in applicants and graduates
 - Geographic gaps in program availability (i.e. Florida)
- **Clinical training challenges:**
 - Limited preceptorship opportunities
 - Competition with other APRN students (Peds NP, FNP, etc.)

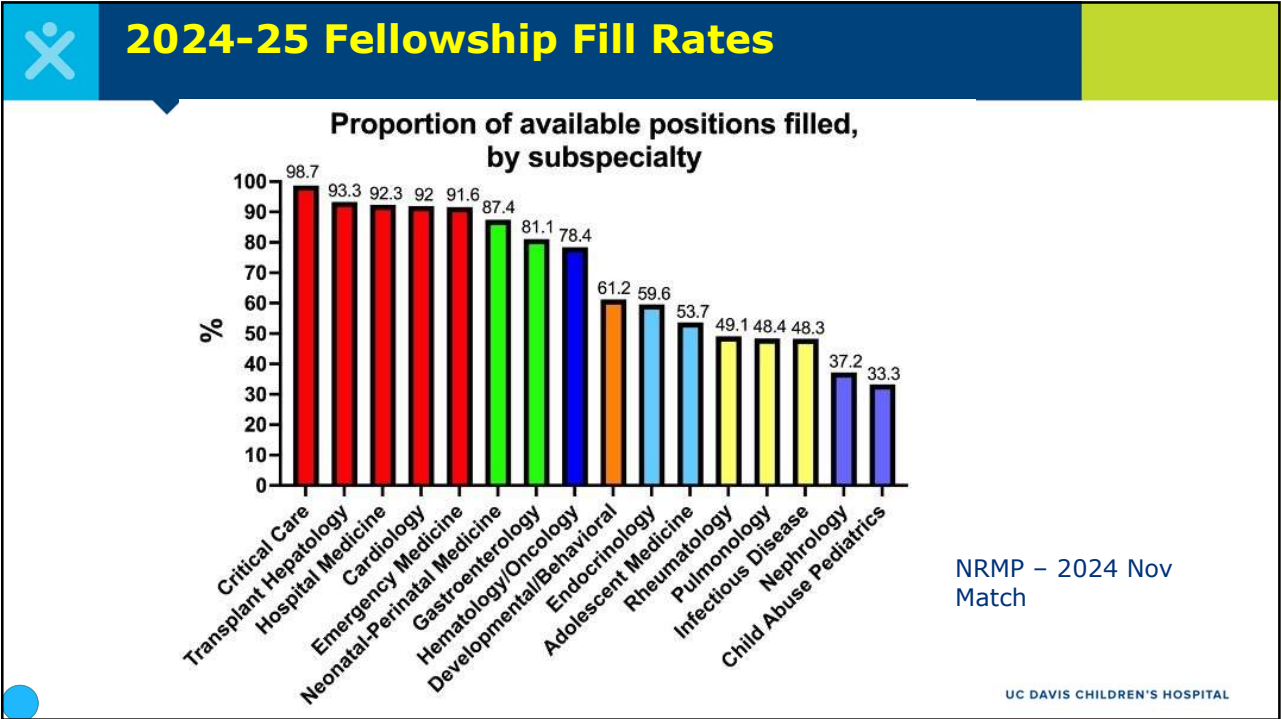


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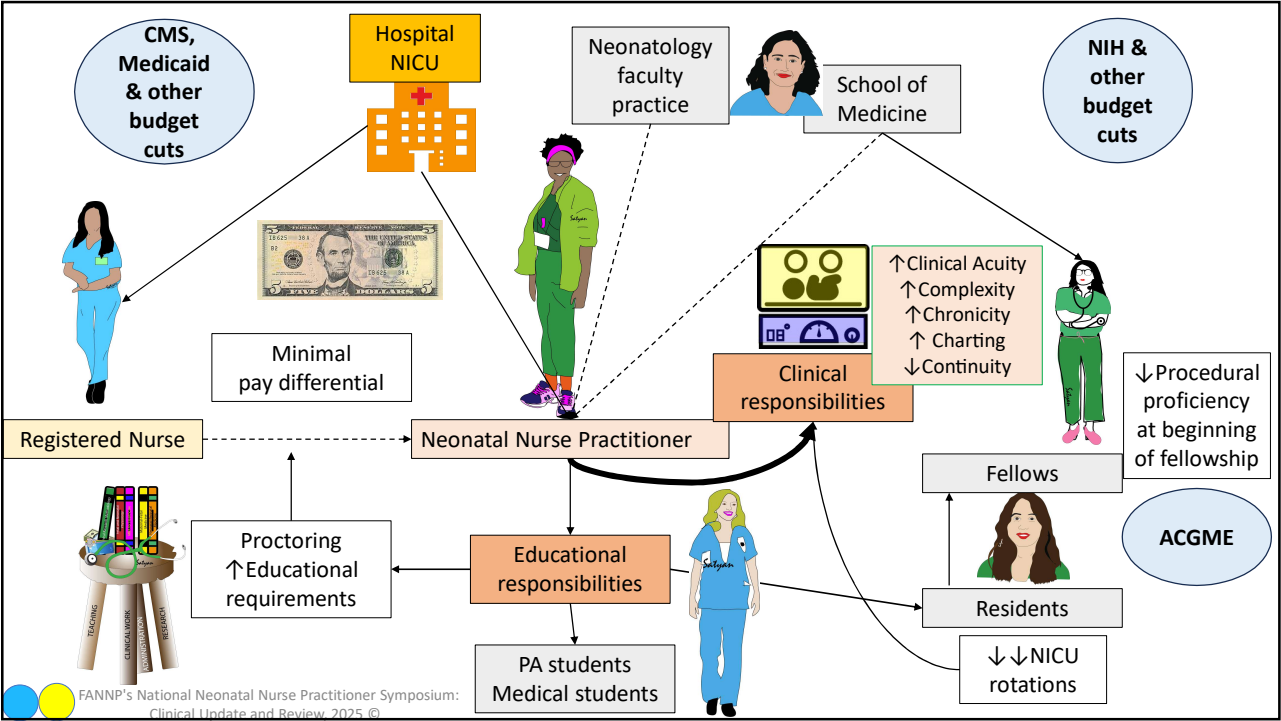
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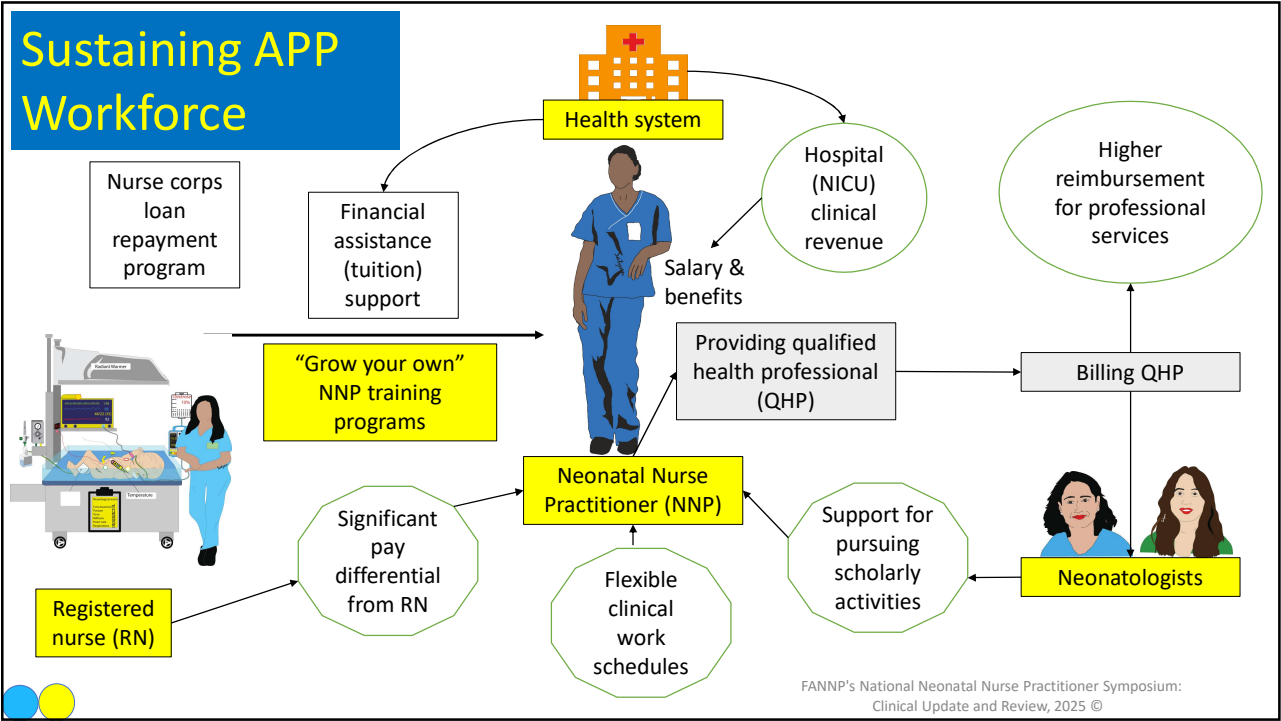
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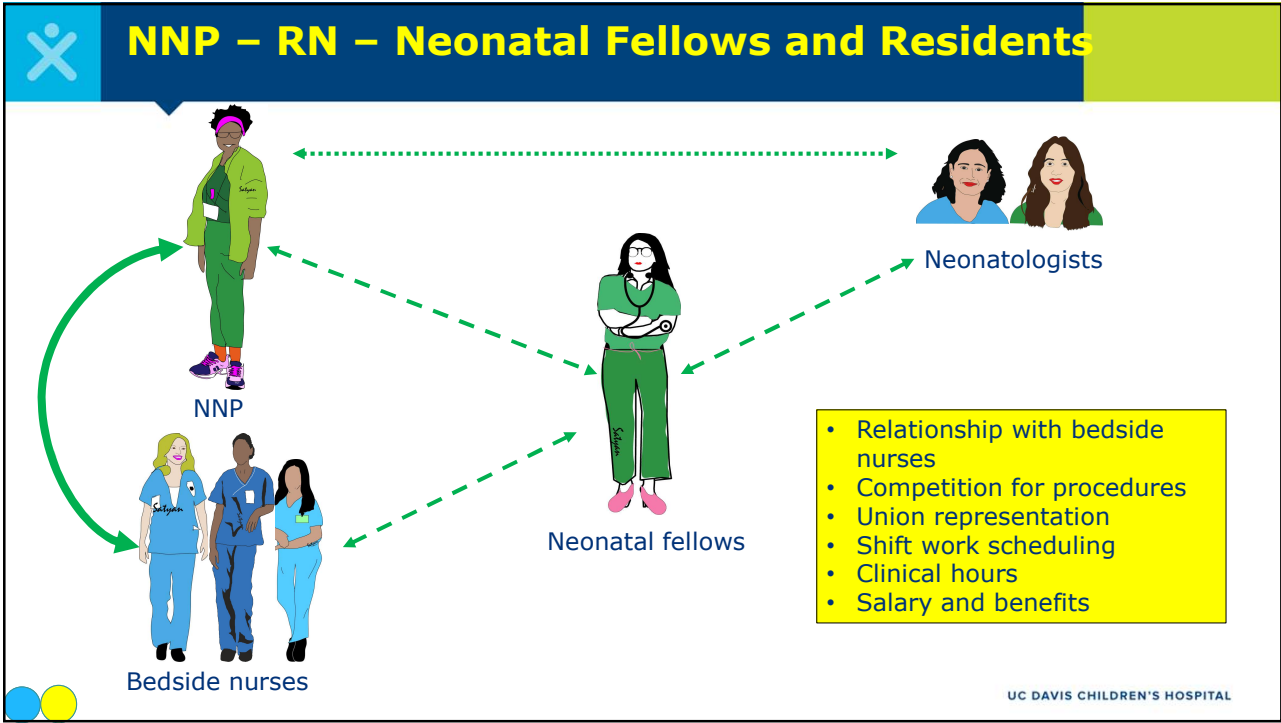
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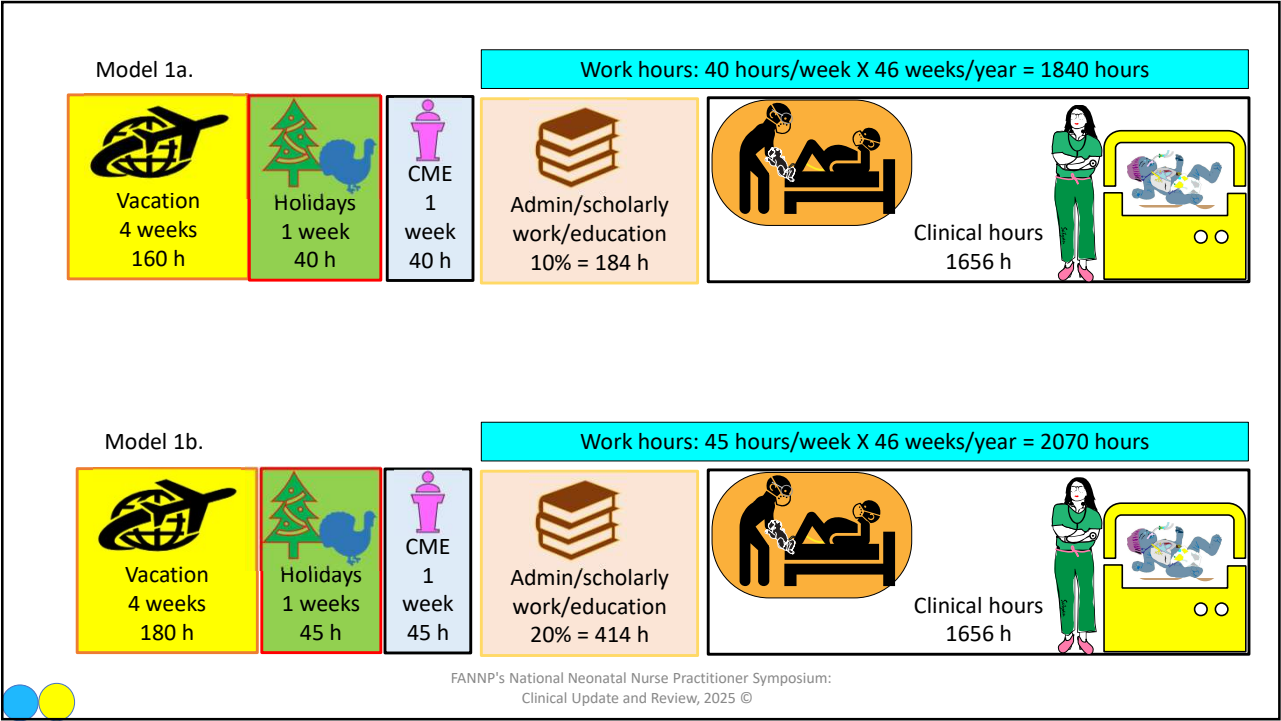
Work Hours: Neonatologists vs. APPs

- 40 hours per week x 46 weeks = 1,840 hours
- Synergy between the Neonatologists, Fellows, Residents and APPs
 - Patient safety
 - Continuity of care
 - Increasing enthusiasm
 - RNs → NNPs
 - Students → Pediatric residents → Neonatal fellows
- Role models to inspire the future generation

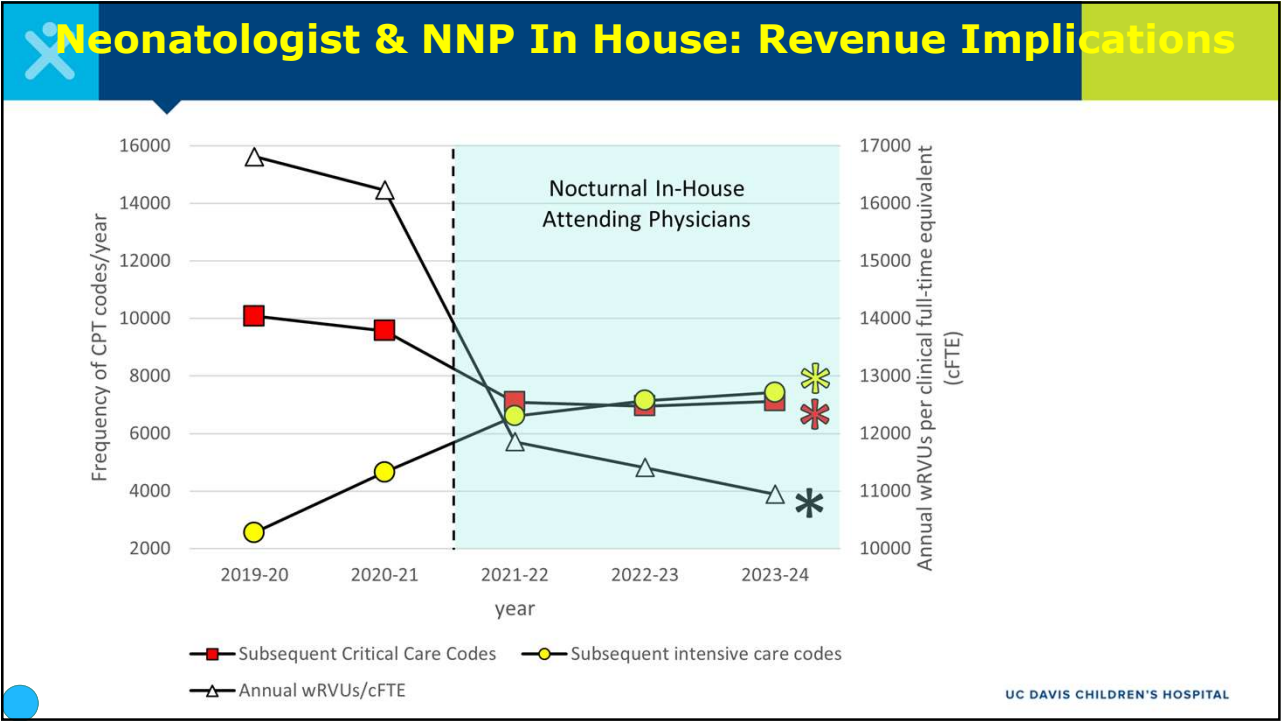
The diagram also includes an illustration of two healthcare professionals in green scrubs, one with a stethoscope.

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UC Davis Staffing Model

- Resident team
 - One attending, one fellow, 2 residents + 0.5 NNP (or hospitalist)
 - Maximum team size: 23
- NNP team
 - One attending (usually one fellow), 2.5 NNPs
- Night: whole unit: 1 attending, 1 fellow, 1 resident and 1 NNP
 - Some nights: when resident gets a day off, need additional NNPs
- Unit: Level IV (but ECMO and post-op cardiac care occurs in CICU) with 49 beds
- The cost of NNPs is covered by the hospital

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Time vs. Productivity vs. Money



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Threats to the NNP Workforce

- Lack of role awareness, advocacy
- Decreased number of NNP students and clinical placement concerns
- NNP role dissatisfaction impacting nurses' mindset towards role
- Minimization of the NNP role, education and training
- On-going nationwide shortage of NNPs in both academic and community hospitals
- Underutilization of the NNP role based on limited scope of practice and reduced/restricted practice authority

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Problem Solving

- **Innovative staffing models:**
 - Hybrid roles (clinical + academic/research)
- **Educational pipeline solutions:**
 - Scholarships, clinical site expansion, residency-style onboarding, preceptor repository
- **Leveraging data:**
 - Workforce forecasting and demand modeling
- **Collaboration opportunities:**
 - Shared regional coverage, NNP consortiums
- **Partnership with AAP to advocate for the role**

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Mentorship and Advocacy

- **Developing future leaders:**
 - Formal mentorship programs vs traditional mentorship
 - Support for novice NNPs transitioning to practice
 - Mentorship as a professional expectation
 - Workforce appearances (are we happy with our role?)
- **Professional organization roles:**
 - State and national advocacy for title protection and reimbursement
 - Involvement in professional associations
- **Public and hospital-level advocacy:**
 - Raising awareness of NNP impact on outcomes
 - Ensuring a seat at the table for policy and staffing decisions

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Summary

- Academic Neonatology – major challenges
- Burnout ↑ (female providers, educators, nurse practitioners and scientists)
- Staffing support: cannot rely exclusively on residents and fellows
- Advance practice provider workforce
 - Effective
 - High demand, low supply
- Patient safety is a priority
 - Very dependent on a sustainable NNP workforce



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Concerns for an Aging Workforce and Burnout

- **NNP workforce aging curve**
 - Projected retirements over next 5–10 years
- **Contributors to burnout:**
 - Night shifts, moral distress, patient acuity, role ambiguity
- **Lack of succession planning and leadership development**
- **Need for wellness programs and institutional support**



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NNP Survey



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Caring for neonates and families is the goal of Neonatologists and NNPs. Administrators should adequately support us and not penalize us because of our passion.



Satyan Lakshminrusimha, MD FAAP

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References

- Gamber, R., Blonsky, H., McDowell, M., & Lakshminrusimha, S. (2023). Declining birth rates, increasing maternal age and neonatal intensive care unit admissions. *Journal of Perinatology*, 44(2), 203–208. <https://doi.org/10.1038/s41372-023-01834-x>
- Grisham, L. M., Goldsmith, J. P., Lucke, A. M., Gephart, S. M., Eichenwald, E., Ambalavanan, N., Guillory, C., Hudak, M., Kaufman, D., Martin, C., Lucke, A., Parker, M., Pramanik, A., & Wade, K. (2025). Advanced practice nursing in neonatology: Clinical report. *Pediatrics*, 156(3). <https://doi.org/10.1542/peds.2025-073170>
- Lakshminrusimha S, Song C, Pearlman SA, Martin G, Duncan S. Controversies in CPT® coding in the neonatal intensive care unit: - critical vs. intensive care. *J Perinatol*. 2023 Dec;43(12):1535-1540. doi: 10.1038/s41372-023-01704-6. Epub 2023 Jun 24. PMID: 37355710; PMCID: PMC10716034.
- Martin JA, Osterman MJK. Increases in Neonatal Intensive Care Admissions in the United States, 2016-2023. *NCHS Data Brief*. 2025 Mar;(525):CS357495. doi: 10.15620/cdc/174581. PMID: 40168594; PMCID: PMC12038910.
- Moss, C., & Jackson, J. (2019). Mentoring new graduate nurse practitioners. *Neonatal Network*, 38(3), 151–159. <https://doi.org/10.1891/0730-0832.38.3.151>
- National Association of Neonatal Nurses (2022).The Impact of Advanced Practice Registered Nurses’ Shift Length and Fatigue on Patient Safety
- National Association of Neonatal Nurses Advanced Practice Council. (2022). The State of Neonatal APRN Role and Action for the Future
- Rasmussen, L. B., Vargo, L. E., Reavey, D. A., & Hunter, K. S. (2005). Pilot survey of nicu nurses' interest in the neonatal nurse practitioner role. *Advances in Neonatal Care*, 5(1), 28–38. <https://doi.org/10.1016/j.adnc.2004.10.004>
- Snapp, B., Moore, T. A., Wallman, C., & Staebler, S. (2021). 2020 neonatal nurse practitioner workforce survey. *Advances in Neonatal Care*, 21(3), 242–246. <https://doi.org/10.1097/anc.0000000000000903>

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