Expansion of a Dedicated TeleNeo Critical Care Service Enhances Newborn Patient Care

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Introduction

The initial Intermountain Health TeleNeo Critical Care (TNCC) service (2013) enhanced access to neonatologists for Level I and Level II nurseries but introduced challenges such as elevated workload for Level III on-site neonatologists, extended connection times, and frequent transfers.

In 2022, a dedicated full-time TNCC service was launched to alleviate the telehealth burden and expedite connection times.

In the first two years of the dedicated TNCC program, which serves patients in all 8 states across the Intermountain West, we expanded our reach by adding three outreach birth sites and two freestanding emergency departments.

This study assesses whether the expanded TNCC service maintained its positive outcomes.

Methods

The team established a devoted phone line for rapid telehealth consultations with a dedicated neonatologist, providing expert guidance. Urgent Transport Imaging Program (UTIP) was implemented for urgent radiological evaluation for possible surgical intervention from Level I, II, III to Level III+, IV. Data were gathered to evaluate the sustainability of the expanded program.

An algorithm was created to identify cases where neonatal critical care transport could be avoided, using nursery level criteria such as the need for multiple TNCC consults, increased respiratory support, IV access, glucose gel administration, facilitation of specialty consults, direct procedural guidance, and prolonged length of stay.

In cases that were unclear, additional manual chart review was completed to determine the outcome. Factors considered included the timing of the consult, available site resources, and the newborn's clinical trajectory.

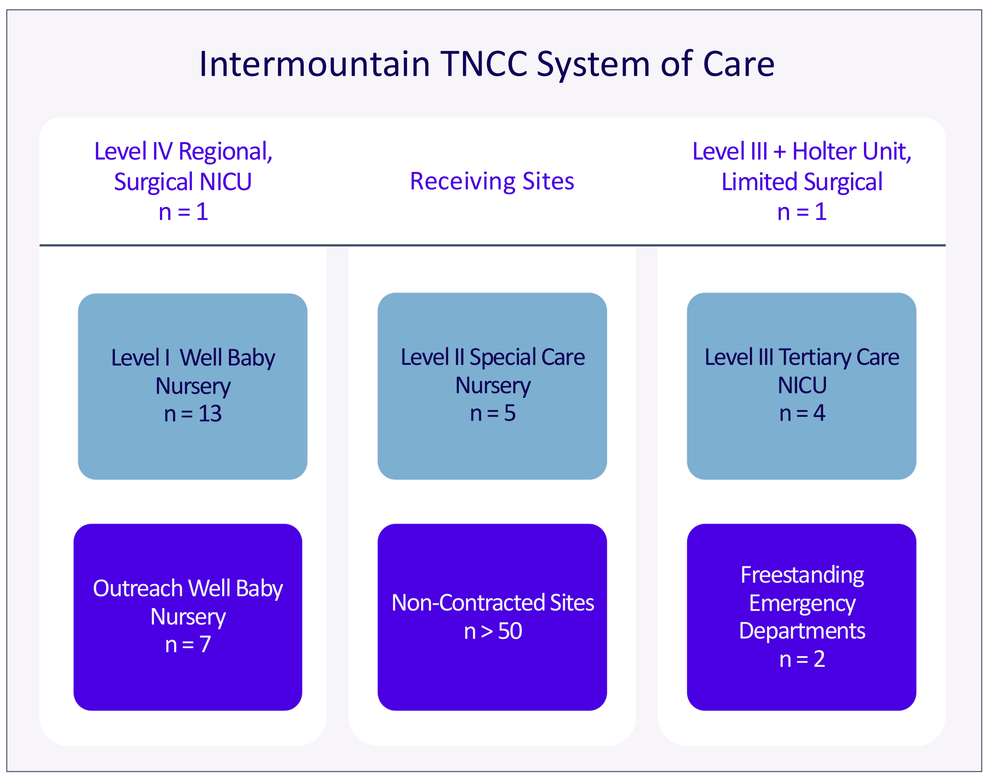

Figure 1. Facilities / Delivery Centers within the Intermountain TNCC System of Care.

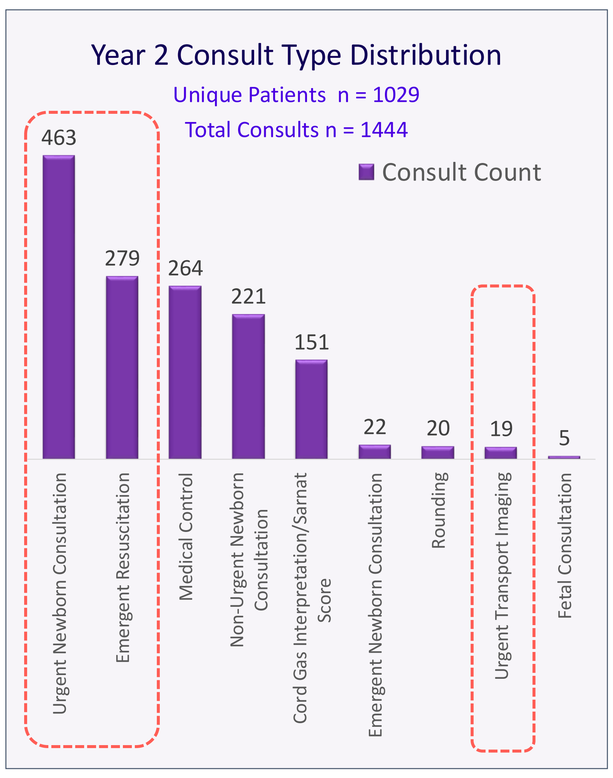

Figure 2. Distribution of nine distinct types of consults, with patients potentially receiving multiple consults.

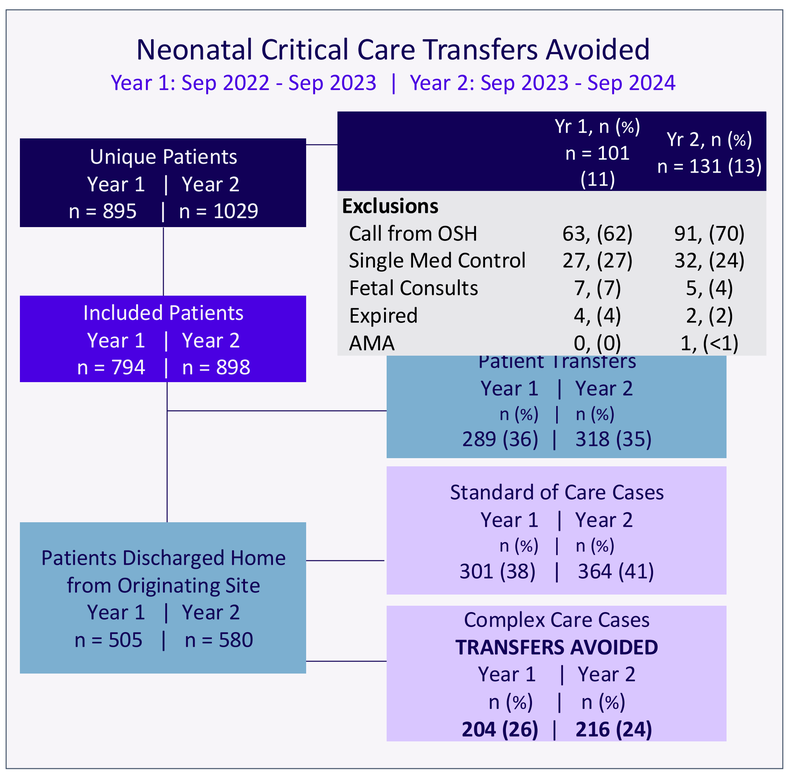

Figure 3. Population chart detailing all patients, exclusions, the denominator of included patients, and the outcomes of those who either transferred or went home. Patients who went home are further categorized into standard care or complex care.

Results

The neonatologist connection time has improved significantly, dropping from an average of five minutes before the dedicated program to just one minute, a rate that has been consistently maintained.

In year two, calls were recorded for 31 contracted birth sites and 50+ additional external birth sites as illustrated in **Figure 1**, 1444 consults were done on 1,029 individual patients indicating an 18% increase in call volume. Of these calls, the majority were for urgent newborn consultations (32%, n=463), while 19% (n=279) pertained to emergent resuscitations and 1% (n=19) to UTIP, as shown in **Figure 2**. Only 19 calls (1%) were rerouted to the Level III on-site neonatologist.

There was no statistical difference in the percentage of transfers avoided between Year 1 (26%, n=204) and Year 2 (24%, n=216) (p = 0.4699), indicating the consistency of positive outcomes over the two-year period, as illustrated in **Figure 3**.

Respiratory disorders were the leading diagnosis group for 58% of patients, who could belong to multiple groups, as depicted in **Figure 4**. The most common neonatology interventions included monitoring and diagnostic testing for 60% of patients, and respiratory support for 58%, as shown in **Figure 5**.

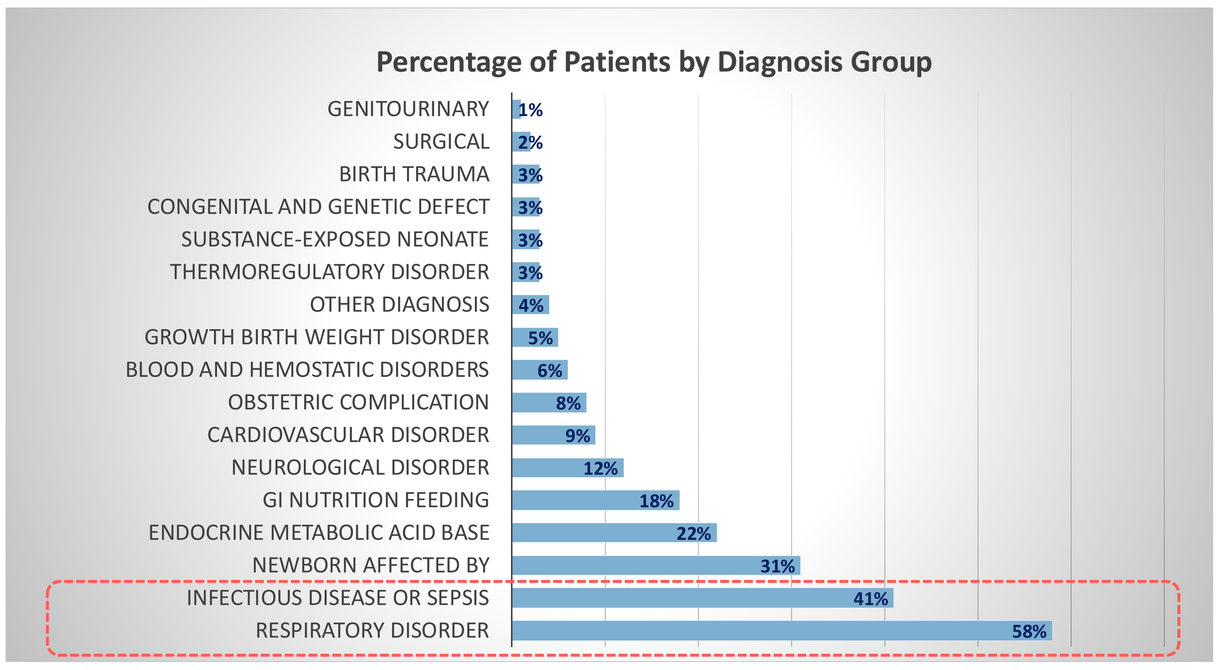

Figure 4. Bar chart illustrating the distribution of diagnosis groups among patients, who may belong to multiple groups. Note that this data was collected only during the last 6 months of the second year and does not represent the entire population.

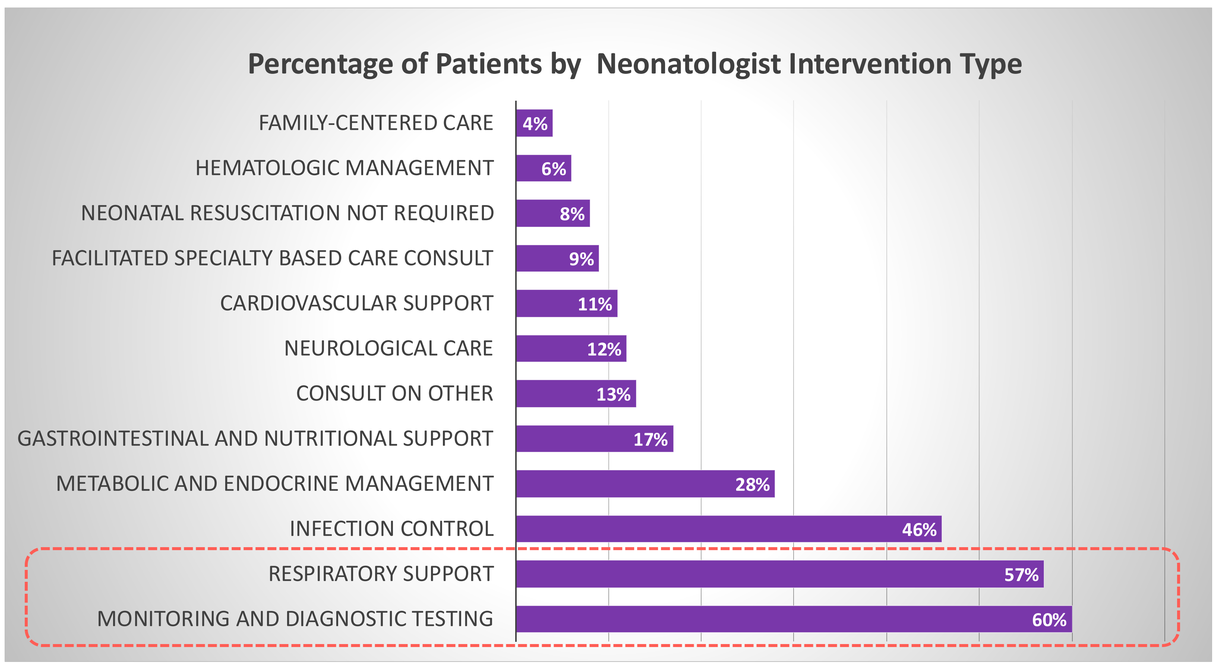

Figure 5. Chart depicting the various neonatology interventions, with patients potentially receiving multiple interventions. This data was also collected only during the last 6 months of the second year and does not reflect the entire population.

Conclusions

- **One in four newborns avoid transfer and stay close to home, demonstrating the value of the service.**
- **Stable transfer avoidance rates despite increased call volume over two years.**
- **TNCC reduced telehealth load on Level III on-site neonatologists and maintained quick connection times.**
- **Results suggest the TNCC service can be safely expanded further.**

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