

MaineHealth

## MaineHealth Knowledge Connection

---

Costas T. Lambrew Research Retreat 2021

Costas T. Lambrew Research Retreat

---

2021

### Telemedicine Consultation to Assess Neonatal Encephalopathy in Rural Community Hospitals

Rachel Coffey  
*Maine Medical Center*

Misty Melendi  
*Maine Medical Center*

Anya J. Cutler  
*Maine Medical Center*

Alexa K. Craig  
*Maine Medical Center*

Follow this and additional works at: <https://knowledgeconnection.mainehealth.org/lambrew-retreat-2021>



Part of the [Telemedicine Commons](#)

---

#### Recommended Citation

Coffey, Rachel; Melendi, Misty; Cutler, Anya J.; and Craig, Alexa K., "Telemedicine Consultation to Assess Neonatal Encephalopathy in Rural Community Hospitals" (2021). *Costas T. Lambrew Research Retreat 2021*. 41.

<https://knowledgeconnection.mainehealth.org/lambrew-retreat-2021/41>

This Book is brought to you for free and open access by the Costas T. Lambrew Research Retreat at MaineHealth Knowledge Connection. It has been accepted for inclusion in Costas T. Lambrew Research Retreat 2021 by an authorized administrator of MaineHealth Knowledge Connection.

# Telemedicine Consultation to Assess Neonatal Encephalopathy in Rural Community Hospitals

Rachel Coffey, DO; Misty Melendi, MD; Anya J. Cutler, MS, MPH; Alexa K. Craig, MD

**We studied the feasibility of teleconsults in community hospitals for neonatal encephalopathy evaluation**

## BACKGROUND

- NE is as a clinical syndrome of abnormal neurological function in neonates >35 weeks GA
- TH inclusion criteria can be challenging to assess
- NE teleconsult evaluations in tertiary care centers are feasible
- In a prior study, time for NE consult was about 5 hours for community hospital born babies<sup>1</sup>

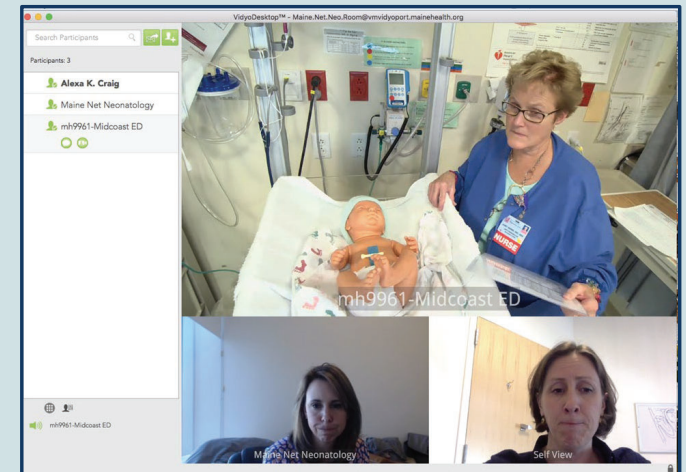
NE: Neonatal Encephalopathy, TH: Therapeutic Hypothermia

**OBJECTIVE:** Decrease the disparity between timeliness of teleconsults initiated in community vs tertiary care hospitals



## METHODS

- Prospective study
- 1 tertiary care center, 9 community hospitals
- 1<sup>o</sup> outcome: time to initial consult
- Provider survey



# Telemedicine Consultation to Assess Neonatal Encephalopathy in Rural Community Hospitals

Rachel Coffey, DO; Misty Melendi, MD; Anya J. Cutler, MS, MPH; Alexa K. Craig, MD

Table 1: Maternal and neonatal characteristics

| Characteristic  | Tertiary Care Center,<br>N = 19 <sup>1</sup> | Community Hospitals,<br>N = 34 <sup>1</sup> | p-value<br>$\chi^2$ |
|---|--|---|---------------------|
| <b>Maternal Age</b>   | 30 (6)                                       | 30 (5)                                      | 0.8                 |
| Unknown   | 0  | 4   |                     |
| <b>Gestational Diabetes</b>   | 4 (21%)                                      | 4 (12%)                                     | 0.4                 |
| <b>GBS Positive</b>   | 5 (26%)                                      | 6 (18%)                                     | 0.5                 |
| <b>Preeclampsia/Eclampsia</b>   | 2 (11%)                                      | 2 (5.9%)                                    | 0.6                 |
| <b>Prolonged Rupture of Membranes</b>                                     | 2 (11%)                                      | 9 (26%)                                     | 0.3                 |
| <b>C-Section</b>  | 13 (68%)                                     | 10 (29%)                                    | <b>0.006</b>        |
| <b>Gestational Age 35-36 wks</b>  | 4 (21%)                                      | 1 (2.9%)                                    | <b>0.050</b>        |
| <b>Male Sex</b>   | 11 (58%)                                     | 24 (71%)                                    | 0.3                 |
| <b>Birth Weight (kg)</b>  | 3.17 (0.53)                                  | 3.64 (0.52)                                 | <b>0.004</b>        |
| Unknown   | 0  | 3   |                     |
| <b>APGAR at 1 Minute</b>  | 3 (2)  | 2 (2)                                       | 0.6                 |
| <b>APGAR at 5 Minutes</b>   | 7 (2)  | 5 (2)                                       | <b>0.016</b>        |
| <b>APGAR at 10 Minutes</b>  | 7 (1)  | 6 (2)                                       | 0.4                 |
| Unknown   | 11   | 7   |                     |
| <b>Umbilical Cord ABG/VBG Obtained</b>                                    | 18 (95%)                                     | 26 (76%)                                    | 0.13                |
| <b>Arterial Cord pH</b>   | 7.07 (0.16)                                  | 7.15 (0.14)                                 | 0.11                |
| Unknown   | 2  | 10  |                     |
| <b>Arterial Base Deficit</b>  | -13.6 (7.4)                                  | -10.0 (4.9)                                 | 0.085               |
| Unknown   | 2  | 12  |                     |
| <b>Venous Cord pH</b>   | 7.14 (0.14)                                  | 7.20 (0.11)                                 | 0.2                 |
| Unknown   | 2  | 11  |                     |
| <b>Venous Base Deficit</b>  | -10.9 (5.9)                                  | -8.6 (4.5)                                  | 0.3                 |
| Unknown   | 2  | 12  |                     |
| <b>Infant ABG or VBG or capillary blood gas within First Hour of Life</b> | 10 (53%)                                     | 16 (48%)                                    | 0.8                 |
| Unknown   | 0  | 1   |                     |
| <b>pH</b>   | 7.25 (0.09)                                  | 7.17 (0.16)                                 | 0.14                |
| Unknown   | 9  | 18  |                     |
| <b>Base Deficit</b>   | -11.5 (5.3)                                  | -10.8 (5.9)                                 | 0.8                 |
| Unknown   | 9  | 20  |                     |
| <b>Received Therapeutic Hypothermia</b>                                   | 7 (37%)                                      | 17 (50%)                                    | 0.4                 |

<sup>1</sup>Mean (SD); n (%)

<sup>2</sup>Wilcoxon rank sum test; Fisher's exact test; Pearson's Chi-squared test; Welch Two Sample t-test

Table 2: Encephalopathy scores and timing of scores

| Characteristic                                 | Tertiary Care Center,<br>N = 19 | Community Hospitals,<br>N = 34 | p-value <sup>1</sup> |
|--|---------------------------------|--------------------------------|----------------------|
| <b>First Encephalopathy Score</b>              |                                 |                                | 0.4                  |
| N  | 19                              | 34                             |                      |
| Median (IQR)                                   | 4 (2, 6)                        | 6 (1, 9)                       |                      |
| <b>Time from birth to first consult (min)</b>  | 66 (43, 91)                     | 98 (76, 127)                   | <b>0.004</b>         |
| <b>Second Encephalopathy Score</b>             |                                 |                                | 0.5                  |
| N  | 14                              | 12                             |                      |
| Median (IQR)                                   | 2 (0, 4)                        | 4 (0, 8)                       |                      |
| <b>Time from first to second consult (min)</b> | 106 (94, 132)                   | 151 (103, 194)                 | 0.3                  |
| <b>Third Encephalopathy Score</b>              |                                 |                                | 0.10                 |
| N  | 4                               | 2                              |                      |
| Median (IQR)                                   | 0 (0, 2)                        | 9 (8, 10)                      |                      |
| <b>Time from second to third consult (min)</b> | 130 (116, 146)                  | 108 (99, 116)                  | 0.5                  |

<sup>1</sup>Wilcoxon rank sum test

## FINDINGS

- Community neonates time to consult improved from 5hrs in the prior study to 1.5hrs in this study
- All community pediatricians reported teleconsults assisted with clinical decision making
- Serial consults can help triage transfers

**Teleconsults in community hospitals can successfully be performed to assess neonatal encephalopathy**

**References:** <sup>1</sup>Craig AK, McAllister LM, Evans S, et al. Telemedicine consults to assess neonatal encephalopathy are feasible in the neonatal intensive care unit. *J Perinatol* 2020 doi: 10.1038/s41372-020-00828-3