



What's New with CPeTS

October 14, 2020

Webinar Logistics

- Attendees are automatically muted upon entry
- The “chat” function has been disabled. **Please utilize the Q&A box if you are having technical difficulties and to submit any questions you have for the presenters. We will answer as many questions as possible during the Q&A portion of the webinar.**
- The slides and webinar recording will be sent out after the webinar and will also be posted on the CPQCC website at <https://www.cpqcc.org/engage/annual-data-training-webinars-2020>

CPETS: CALIFORNIA PERINATAL TRANSPORT SYSTEMS

What's New in The Neonatal Transport Data Program, 2021

Presented by:

- D. Lisa Bollman, MSN, RNC-NIC, CPHQ
 - Director: Southern California Perinatal Transport System
- Ron Cohen, MD,
 - Medical Director: Northern California Perinatal Transport System

CONFLICT OF INTEREST

- We have no conflicts of interest to disclose.
- We will not be making any recommendations on medications, devices or equipment in this lecture.

OBJECTIVES

Following the presentation and discussion the participant will be able to:

- Describe California's acute neonatal transport dataset;
- Describe intrapartum vs. neonatal transport data and describe best practices in implementing data collection for this topic;
- Describe changes in the CPeTS Database for the 2021 Data Year ; and
- Understand how to use standard reports for CPeTS data and identify areas of improvement opportunity.

CALIFORNIA PERINATAL TRANSPORT SYSTEM

Legislatively mandated by AB 4439 in 1976, required by California Perinatal Quality Care Collaborative (CPQCC), California Children's Services (CCS) and California Department of Public Health(CDPH), managed by Regional Perinatal Programs of California (RPPC).

- Bed Availability and Direct Referral Information
- Neonatal Data System
 - Collection and Entry
 - Standardized Reports
 - Transports In
 - Transports Out
 - Tools and Support Materials
- Maternal Transport Data System Development

QUALITY CALIFORNIA NEONATAL TRANSPORT DATA BASE

- Developed during 2005-2006
- First full year of data – 2007
- All CCS designated NICUs in California plus any facilities with licensed Intensive Care Neonatal Nursery who chooses to participate.
- Prospective clinical data collected from
 - 6000-7000 **acute** neonatal transports annually
 - ~75,000 acute transports in dataset
 - Within the first 28 days of life, into NICU services, transported by a team
 - Received by up to 140 NICUs in California
 - 57 transport teams

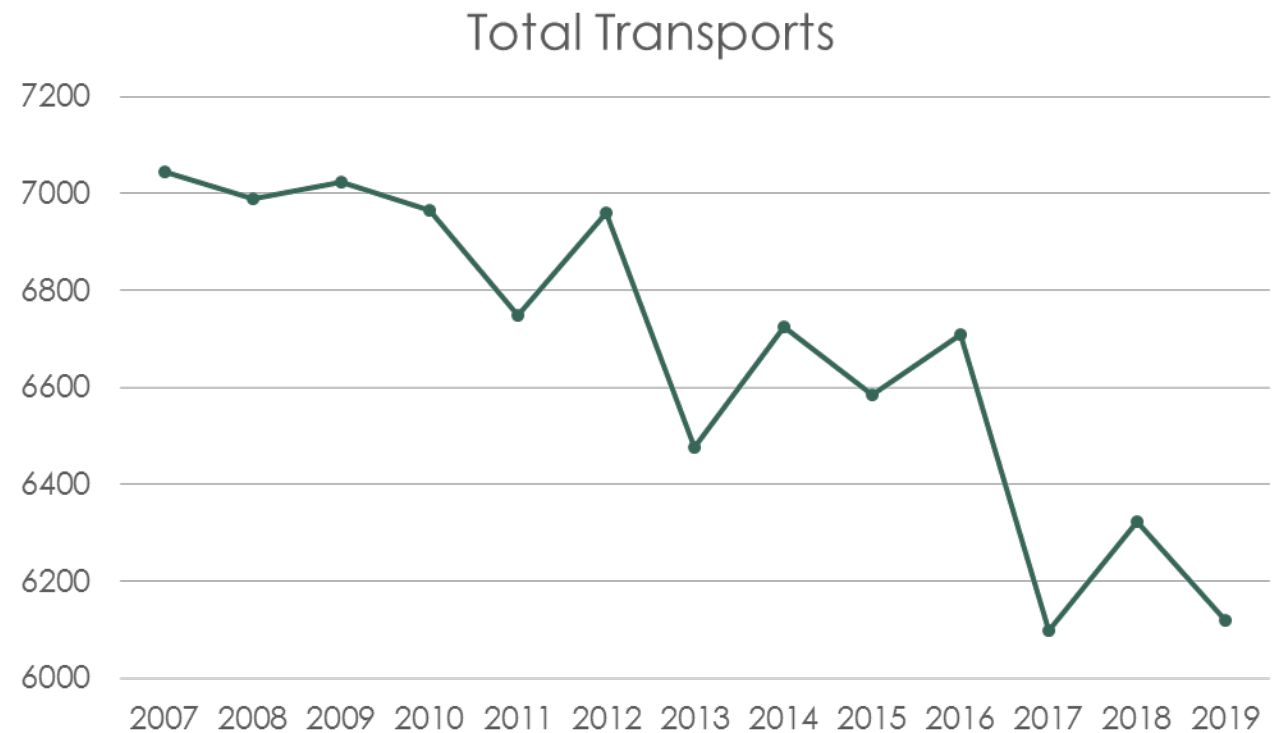


CALIFORNIA ACUTE NEONATAL TRANSPORT ACTIVITY, 2019



QUALITY CALIFORNIA NEONATAL TRANSPORT DATA

Year	Total Transports	Unknowns	Number of Entries per Record
2019	6,119	1.3	1.2
2018	6,323	1.3	1.2
2017	6,097	1.2	1.3
2016	6,710	1.3	1.7
2015	6,584	1.4	1.9
2014	6,724	2.5	1.9
2013	6,477	1.6	1.9
2012	6,961	1.4	2.3
2011	6,750	1.6	2.7
2010	6,965	1.9	3.3
2009	7,025	2.1	3.6
2008	6,989	2.6	35
2007	7,045	4.9	4.0



CALIFORNIA ACUTE TRANSPORT ACTIVITY BY FACILITY, 2019

- Total Acute Transports 6,119
- 136 member facilities
- 100 facilities reporting acute transports
- Average 63
- Transport Volume
 - 30 facilities with ≤ 10 acute transports/year,

ACUTE NEONATAL TRANSPORTS IN (PRIMARY AND SECONDARY)*, 2019 (COLUMN #/%)

	CPQCC Network Total	CPQCC Regional NICUs	CPQCC Community NICUs	CPQCC Intermediate / Others
All Birth Weights	6,119	4,367	1,720	32
≤ 500 grams	9 / 0.1%	8 / 0.2%	1	0
501-750 grams	149 / 2.4%	122 / 2.8%	27 / 1.6%	0
751 – 1,000 grams	165 / 2.7%	130 / 3.0%	35 / 2.0%	0
1,001-1,500 grams	400 / 6.5%	259 / 50.9%	140 / 8.1%	1
1,501-2,500 grams	1,417 / 23.2%	981 / 22.5%	426 / 24.8%	10
> 2,500 grams	3,979 / 65.0%	2,867 / 65.7%	1,091 / 63.4%	21

SO FAR IN 2020, 3,053 ACUTE NEONATAL TRANSPORTS HAVE BEEN REPORTED.

Acute Neonatal Transports (Primary and Secondary)*, by Birthweight Category, California, 2020

VLBW (<1,500 grams)	155 / 12.3
LBW (\geq 1,500 grams to 2,499 grams)	644 / 21.1
Appropriate Birth Weight (\geq 2,500 grams)	2065 / 67.6%



CHANGES FOR 2021



CHANGES IN CPETS DATA COLLECTION FOR 2021



CORE CPETS ACUTE INTER-FACILITY NEONATAL TRANSPORT FORM – 2021

PATIENT DIAGNOSIS Special Situations: <input type="checkbox"/> None <input type="checkbox"/> Delivery Attendance <input type="checkbox"/> Transport by Sending Facility <input type="checkbox"/> Transport from ER <input type="checkbox"/> Safe Surr.			
C.1 Transport type <input type="checkbox"/> Delivery <input type="checkbox"/> Emergent <input type="checkbox"/> Urgent <input type="checkbox"/> Scheduled		C.2. Indication <input type="checkbox"/> Medical <input type="checkbox"/> Surgical <input type="checkbox"/> Bed Availability/Insurance	
CRITICAL BACKGROUND INFORMATION			
C.3 Birth weight _____ grams		C.4 Gestational Age _____ weeks _____ days	
C.5 <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Undetermined <input type="checkbox"/> Unknown		C.6 Prenatally Diagnosed Congenital Anomalies <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Describe: _____	
C.7 Maternal Date of Birth _____		C.8a. Antenatal Steroids <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A	
C.8b. Antenatal Magnesium Sulfate <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			
TIME SEQUENCE			
C.10 Maternal Admission to Perinatal Unit or Labor & Delivery		Date	Time
C.11 Infant Birth			
C.12 Maternal/fetal transport not done due to: <input type="checkbox"/> Advanced Labor <input type="checkbox"/> Bleeding <input type="checkbox"/> Mother Medically Unstable <input type="checkbox"/> Non-Reassuring Fetal Status <input type="checkbox"/> Not Considered <input type="checkbox"/> Unknown			
C.9/13 Surfactant (first dose) <input type="checkbox"/> Delivery Room <input type="checkbox"/> Nursery <input type="checkbox"/> N/A <input type="checkbox"/> Unknown			
C.14 Referral			
C.15 Acceptance			
C.16 Transport Team Departure from Transport Team Office/NICU for Sending Hospital			
C.17 Arrival of Team at Sending Hospital/Patient Bedside			
C.18 Initial Transport Team Evaluation			
C.19 Arrival at Receiving NICU			
INFANT CONDITION		REFERRAL PROCESS	
Modified TRIPS Score: to be recorded on referral, within 15 minutes of arrival at sending hospital and admit to NICU.		C.30 Sending Hospital Name	
		Previous CPQCC ID#	
		Sending Hospital Nursing Contact Information Name/Telephone	
C.20 Responsiveness	Referral	Initial Transport	NICU Admit
C.21 Temperature C°			
C.21.a. Too low to register	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
C.21.b. Was the infant cooled?	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
C.21.c. Method of cooling +			
C.22 Heart Rate			
C.23 Respiratory Rate			
C.24 Oxygen Saturation			
C.25 Respiratory Status *			
C.26 Inspired Oxygen Concentration			
C.27 Respiratory Support ^{1,2}			
C.28 Blood Pressure Systolic / Diastolic Mean			
N=Not Done, T=Too low to register	<input type="checkbox"/> N <input type="checkbox"/> T	<input type="checkbox"/> N <input type="checkbox"/> T	<input type="checkbox"/> N <input type="checkbox"/> T
C.29 Pressors	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
Additional Information for CPQCC Admit and Discharge Form Only			
Birth Head Circumference _____ cm Labor Type <input type="checkbox"/> Spontaneous <input type="checkbox"/> Induced <input type="checkbox"/> Unknown Rupture of Membranes > 18 hours <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			
Delivery Mode <input type="checkbox"/> Spontaneous Vaginal <input type="checkbox"/> Operative Vaginal <input type="checkbox"/> Cesarean <input type="checkbox"/> Unknown			
Delayed Cord Clamping <input type="checkbox"/> Yes <input type="checkbox"/> 30-60 sec <input type="checkbox"/> 61-120 sec <input type="checkbox"/> >120 sec <input type="checkbox"/> No <input type="checkbox"/> Maternal Bleeding <input type="checkbox"/> Neonatal Causes <input type="checkbox"/> Other <input type="checkbox"/> Unknown			
Breathing before Clamped <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Cord milking performed <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			
Death <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Prior to Team Arrival <input type="checkbox"/> Prior to Departure from Sending Hospital <input type="checkbox"/> Prior to Arrival at Receiving NICU			
*Responsiveness: 0=Death 1=None, Seizure, Muscle Relaxant 2=Lethargic, no cry 3=Vigorously withdraws, cry +Method of cooling: Passive, Selective Head , Whole Body, Other, Unknown *Respiratory Status: 1=Ventilator 2= Severe (apnea, gasping) 3=Other 9= Unknown Respiratory Rate: High Frequency Ventilation = 400 ^{1,2} Respiratory Support: 0 = None, 1 = Hood/Nasal Cannula, Flowby , 2 = Nasal Continuous Positive Airway Pressure, 3 = Nasal Ventilation(NIPPV / NIMV) 4 = Oral/Nasal Endotracheal Tube 9= Unknown			

INFANT CONDITION				REFERRAL PROCESS
Modified TRIPS Score: to be recorded on referral, within 15 minutes of arrival at sending hospital and admit to NICU.				C.30 Sending Hospital Name
				Previous CPQCC ID#
	Referral	Initial Transport	NICU Admit	Sending Hospital Nursing Contact Information Name/Telephone
C.20 Responsiveness				C.31a Previously Transported? <input type="checkbox"/> Yes <input type="checkbox"/> No C.31b From:
C.21 Temperature C°				C.32 Birth Hospital Name
C.21.a. Too low to register	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	C.33 Transport Team On-Site Leader (check only one)
C.21.b. Was the infant cooled?	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Sub-specialist Physician <input type="checkbox"/> Pediatrician <input type="checkbox"/> Other MD/Resident
C.21.c. Method of cooling +				<input type="checkbox"/> Neonatal Nurse Practitioner <input type="checkbox"/> Transport Specialist <input type="checkbox"/> Nurse
C.22 Heart Rate				C.34a Team From <input type="checkbox"/> Receiving Hospital <input type="checkbox"/> Sending Hospital
C.23 Respiratory Rate				<input type="checkbox"/> Contract Service
C.24 Oxygen Saturation				C.34b Describe (name of Contract Service):
C.25 Respiratory Status *				C.35 Mode <input type="checkbox"/> Ground <input type="checkbox"/> Helicopter <input type="checkbox"/> Fixed Wing
C.26 Inspired Oxygen Concentration				Transport Team Informant Name(s)/Telephone Numbers
C.27 Respiratory Support $\frac{1}{2}$				
C.28 Blood Pressure Systolic / Diastolic Mean				Comments
N=Not Done, T=Too low to register	<input type="checkbox"/> N <input type="checkbox"/> T	<input type="checkbox"/> N <input type="checkbox"/> T	<input type="checkbox"/> N <input type="checkbox"/> T	
C.29 Pressors	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	
Additional Information for CPQCC Admit and Discharge Form Only				
Birth Head Circumference cm Labor Type <input type="checkbox"/> Spontaneous <input type="checkbox"/> Induced <input type="checkbox"/> Unknown Rupture of Membranes > 18 hours <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				
Delivery Mode <input type="checkbox"/> Spontaneous Vaginal <input type="checkbox"/> Operative Vaginal <input type="checkbox"/> Cesarean <input type="checkbox"/> Unknown				
Delayed Cord Clamping <input type="checkbox"/> Yes <input type="checkbox"/> 30-60 sec <input type="checkbox"/> 61-120 sec <input type="checkbox"/> >120 sec <input type="checkbox"/> No <input type="checkbox"/> Maternal Bleeding <input type="checkbox"/> Neonatal Causes <input type="checkbox"/> Other <input type="checkbox"/> Unknown				
Breathing before Clamped <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Cord milking performed <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				
Death <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Prior to Team Arrival <input type="checkbox"/> Prior to Departure from Sending Hospital <input type="checkbox"/> Prior to Arrival at Receiving Hospital				
Responsiveness: 0=Death 1=None, Seizure, Muscle Relaxant 2=Lethargic, no cry 3=Vigorously withdraws, cry +Method of cooling: Passive, Selective Head , Whole Body, Other, Unknown *Respiratory Status: 1=Ventilator 2= Severe (apnea, gasping) 3=Other 9= Unknown Respiratory Rate: High Frequency Ventilation = 400 $\frac{1}{2}$ Respiratory Support: 0 = None, 1 = Hood/Nasal Cannula, Blowby , 2 = Nasal Continuous Positive Airway Pressure, 3 = Nasal Ventilation(NIPPV / NIMV) 4 = Oral/Nasal Endotracheal Tube 9= Unknown				

INFANT CONDITIONS/TRIPS

C.258 Blood Pressure

ADDED

- N=Not Done, T Too Low to Register

C.21.c. Method of Cooling

- Delete Head Cooling option
- Leaving Passive, Whole Body, Unknown

QUESTION C.28 BLOOD PRESSURE

C.28 Blood Pressure	<u>Systolic</u> /		
.....	Diastolic		
.....	Mean		
N=Not Done, T=Too low to register			
	<input type="checkbox"/> N <input type="checkbox"/> T	<input type="checkbox"/> N <input type="checkbox"/> T	<input type="checkbox"/> N <input type="checkbox"/> T

QUESTION C.21.C “METHOD OF COOLING

⊛ Responsiveness: 0=Death 1=None, Seizure, Muscle Relaxant 2=Lethargic, no cry
3=Vigorously withdraws, cry

✦ Method of cooling: Passive, ~~Selective Head~~, Whole Body, Other, Unknown

★ Respiratory Status: 1=Ventilator 2= Severe (apnea, gasping) 3=Other 9= Unknown

Respiratory Rate: High Frequency Ventilation = 400

⊗ Respiratory Support: 0 = None, 1 = Hood/Nasal Cannula, Blowby 2 = Nasal Continuous

Positive Airway Pressure, 3 = Nasal Ventilation(NIPPV / NIMV)

4 = Oral/Nasal Endotracheal Tube 9= Unknown

CHANGES FOR 2021 CONSIDERED BUT **NOT** INCLUDED

- Add blood glucose
 - this was formerly on the form and used in the TRIPS score, but was found to be difficult to obtain and not useful in determining outcome. Blood glucose can be noted in comments if desired.
- Pertinent Mother's labs (i.e. GBS, HEP B, RPR, drug testing, etc)
 - These are available on the discharge summary and we do not want to burden the transport team with collecting data not directly pertinent to the transported baby's care.
- APGARS
 - See discharge summary for this information. Collected in CPQCC Admit/Discharge Dataset



2020 CHANGE:

ADDED C.12 MATERNAL FETAL TRANSPORT NOT DONE



MATERNAL/FETAL TRANSPORT DATA

CORE CPETS ACUTE INTER-FACILITY NEONATAL TRANSPORT FORM – 2020 PLEASE PRINT CLEARLY

PATIENT DIAGNOSIS			Special Situations: <input type="checkbox"/> None <input type="checkbox"/> Delivery Attendance <input type="checkbox"/> Transport by Sending Facility <input type="checkbox"/> Transport from ER <input type="checkbox"/> Safe Surv.		
C.1 Transport type <input type="checkbox"/> Delivery <input type="checkbox"/> Emergent <input type="checkbox"/> Urgent <input type="checkbox"/> Scheduled		C.2. Indication <input type="checkbox"/> Medical <input type="checkbox"/> Surgical <input type="checkbox"/> Bed Availability/Insurance			
CRITICAL BACKGROUND INFORMATION					
C.3 Birth weight	grams	C.4 Gestational Age	weeks	days	C.5 <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Undetermined <input type="checkbox"/> Unknown
C.8 Prenatally Diagnosed Congenital Anomalies <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Describe:			C.7 Maternal Date of Birth <input type="checkbox"/> Unknown		
C.8a. Antenatal Steroids <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> N/A		C.8b. Antenatal Magnesium Sulfate <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			
TIME SEQUENCE			Date	Time	
C.10 Maternal Admission to Perinatal Unit or Labor & Delivery					
C.11 Infant Birth					
C.12 Maternal/fetal transport not done due to: <input type="checkbox"/> Advanced Labor <input type="checkbox"/> Bleeding <input type="checkbox"/> Mother Medically Unstable <input type="checkbox"/> Non-Reassuring Fetal Status <input type="checkbox"/> Not Considered <input type="checkbox"/> Unk					
C.9/13 Surfactant (first dose) <input type="checkbox"/> Delivery Room <input type="checkbox"/> Nursery <input type="checkbox"/> N/A <input type="checkbox"/> Unknown					
C.14 Referral					
C.15 Acceptance					
C.16 Transport Team Departure from Transport Team Office/NICU for Sending Hospital					
C.17 Arrival of Team at Sending Hospital/Patient Bedside					
C.18 Initial Transport Team Evaluation					
C.19 Arrival at Receiving NICU					

Item C.12 Maternal/Fetal Transport Consideration [MFTRANSCON]

CHANGE

- Re-numbered Item C.12 Date /Time of Infant Birth to C.11 (replacing previously unused C.11 Date/Time of Antenatal Steroid Administration)
- Replaced Item C.12 with Maternal and Fetal Transport Consideration

2020 Updated CPeTS Definition

Fill in this item only if the following conditions are met:

- Referring facility is a primary care or intermediate NICU or Non-CCS designated NICU

AND

- (C.1) Transport Type is:
 - Requested Delivery Room Attendance
 - Emergent
 - Urgent

AND one of the following is true:

- Anticipated birthweight < 1,500 grams
- Gestational age < 32 weeks
- Prenatally diagnosed congenital anomalies found

AND

- (C.10) Maternal Admission is \geq 24 hours before (C.11) Infant Birth

If the above conditions are met, select the reason why maternal/fetal transport did not occur:

Select **Advanced Labor (Dilation)** if the mother was not transported due to advanced labor (cervical dilation).

Select **Bleeding** if the mother was not transported because of maternal bleeding.

Select **Mother Medically Unstable** if the mother was not transported because she was medically unstable.

Select **Fetal Distress** if the mother was not transported because of distress detected in the fetus.

Select **Not Considered** if maternal/fetal transport was not considered.

Select **Unknown** if the reason for not transporting the mother is not known or cannot be obtained.

Select **Not Applicable** if the conditions above are not met.

2020 PRELIMINARY DATA ON C.12 – MATERNAL/FETAL TRANSPORT NOT DONE

- Number of forms submitted 2020 (up to ~Sep): 2569
 - Referring facility is primary/intermediate/non-CCS: 1465
 - Maternal admission > 24 h prior to birth: 462
 - Transport type = DR attendance/emergent/urgent
- **All of the above are independent – so # of records with all 3 of those combined = 229**

- Among those 229:
 - Prenatal diagnosed congenital anomalies = 6
 - Infants with GA < 32 weeks = 32
 - Infants with BW < 1500 grams = 33

- **Infants with prenatal diagnosed congenital anomalies or GA < 32 weeks = 38**
- **Infants with prenatal diagnosed congenital anomalies or GA < 32 weeks or BW < 1500 grams = 46**

QUESTION C12: LATE TRANSPORT FOR INFANTS WITH CONGENITAL ANOMALIES OR EGA < 32 WEEKS (TOTAL REPORTING 38)

Reason	n (%)
Blank	7 (18.4)
Advanced Labor	2 (5.3)
Mother Medically Unstable	3 (7.9)
Non-reassuring Fetal Status	1 (2.6)
Not Considered	25 (65.8)

QUESTION C12: LATE TRANSPORT FOR INFANTS WITH CONGENITAL ANOMALIES OR EGA < 32 WEEKS OR BW < 1.5 KG (TOTAL REPORTING 46)

Reason	n (%)
Blank	14 (30.4)
Advanced Labor	2 (4.4)
Mother Medically Unstable	3 (6.5)
Non-reassuring Fetal Status	2 (4.4)
Not Considered	25 (54.4)

WHAT ARE THE BARRIERS TO CAPTURING THIS INFORMATION?

- Identification of infants meeting criteria for inclusion?
- Gathering data from Referring / Sending Facilities?
- Still being collected for this year – time delays?
- Other issues?



PUBLICATIONS, 2020



CPeTS BASED PUBLICATIONS 2020

Neonatal transport in California: findings from a qualitative investigation

Vishnu Priya Akula¹ · Laura C. Hedli¹ · Krisa Van Meurs¹ · Jeffrey B. Gould^{1,2,3} · Kan Peiyi³ · Henry C. Lee^{1,3}

Received: 2 January 2019 / Revised: 28 April 2019 / Accepted: 17 May 2019 / Published online: 3 July 2019
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Abstract

Objective To identify characteristics of neonatal transport in California and which factors influence team performance.

Study design We led focus group discussions with 19 transport teams operating in California, interviewing 158 neonatal transport team members. Transcripts were analyzed using a thematic analysis approach.

Result The composition of transport teams varied widely. There was strong thematic resonance to suggest that the nature of emergent neonatal transports is unpredictable and poses several significant challenges including staffing, ambulance availability, and administrative support. Teams reported dealing with this unpredictability by engaging in teamwork, gathering experience with staff at referral hospitals, planning for a wide variety of circumstances, specialized training, debriefing after events, and implementing quality improvement strategies.

Conclusion Our findings suggest potential opportunities for improvement in neonatal transport. Future research can explore the cost and benefits of strategies such as dedicated transport services, transfer centers, and telemedicine.

Journal of Perinatology (2020) 40:394–403
<https://doi.org/10.1038/s41372-019-0409-7>

Clinical deterioration during neonatal transport in California

Vidya V. Pai¹ · Peiyi Kan^{1,2} · Jeffrey B. Gould^{1,2} · Alvin Hackel³ · Henry C. Lee^{1,2}

Received: 7 February 2019 / Revised: 9 July 2019 / Accepted: 23 July 2019 / Published online: 5 September 2019
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Abstract

Objective Identify clinical factors, transport characteristics and transport time intervals associated with clinical deterioration during neonatal transport in California.

Study design Population-based database was used to evaluate 47,794 infants transported before 7 days after birth from 2007 to 2016. Log binomial regression was used to estimate relative risks.

Results 30.8% of infants had clinical deterioration. Clinical deterioration was associated with prematurity, delivery room resuscitation, severe birth defects, emergent transports, transports by helicopter and requests for delivery room attendance. When evaluating transport time intervals, time required for evaluation by the transport team was associated with increased risk of clinical deterioration. Modifiable transport intervals were not associated with increased risk.

Conclusion Our results suggest that high-risk infants are more likely to be unstable during transport. Coordination and timing of neonatal transport in California appears to be effective and does not seem to contribute to clinical deterioration despite variation in the duration of these processes.

Journal of Perinatology (2020) 40:377–384
<https://doi.org/10.1038/s41372-019-0488-5>



MATERIALS AND RESOURCES



HIE COOL TOOL CALCULATOR



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HIE Calculator (Cool Tool)

The HIE Calculator is intended to promote identification and early referral of babies at risk for hypoxic-ischemic encephalopathy (HIE). It does not determine if a baby should be cooled. The decision to proceed with cooling should only be made after consultation with a Regional Cooling Center (CCS numbered letter), based upon their institutional criteria.

These recommendations are based on CPQCC's Neonatal Therapeutic Hypothermia toolkit.

Resource Category:
[Provider Tool](#)

Date:
September 2020

USE THE TOOL

Become a member

Join a QI project

Collaborate on research



1265 Welch Road, MS 5415
Stanford, CA 94305
Tel: +1 650.721.6540



CONTACT US

NEURO ANALYSIS

Enter details below

Gestational Age >= 35wks * Yes No unknown



Age in Hours * ?

Acute Perinatal Events ? Unknown Placental Abruption Cord Prolapse Uterine Distress

Apgar @10min ?

Worst Cord Blood Gas ? BaseDef

Infant Blood Gas within 1hr of life ? BaseDef

CPR/Epinephrine ?

Continued need for assisted ventilation at 10 mins of life. Yes No unknown



Change Input

Determine Recommendations >>

Neonatal Neuro Tool

Switch to detailed view

Time of life at neuro exam: Hr Min

Seizures: No known episode EEG Confirmed Suspected/Clinical

Explain seizure

** Click to select characteristics for each row in the table below

Level of Consciousness	<input type="radio"/> Normal See video	<input type="radio"/> Irritable / Hyperalert	<input type="radio"/> Lethargic / Obtunded See video	<input checked="" type="radio"/> Stupor / Unresponsive	<input type="radio"/> Cannot Assess
Spontaneous Activity	<input type="radio"/> Normal See video	<input type="radio"/> Jittery / Increased See video	<input type="radio"/> Decreased See video	<input type="radio"/> No Activity See video	<input checked="" type="radio"/> Cannot Assess
Posture	<input type="radio"/> Normal See video	<input type="radio"/> Slight flexion / extension See video	<input type="radio"/> Distal Flexion / Complete Extension See video	<input type="radio"/> Decerebrate	<input checked="" type="radio"/> Cannot Assess
Tone	<input type="radio"/> Normal See video	<input type="radio"/> Increased See video	<input type="radio"/> Hypotonic See video	<input checked="" type="radio"/> Flaccid See video	<input type="radio"/> Cannot Assess
Suck	<input type="radio"/> Normal See video	<input type="radio"/> Uncoordinated See video	<input type="radio"/> Weak See video	<input checked="" type="radio"/> Absent See video	<input type="radio"/> Cannot Assess
Moro	<input type="radio"/> Normal See video	<input type="radio"/> Exaggerated	<input type="radio"/> Incomplete See video	<input checked="" type="radio"/> Absent	<input type="radio"/> Cannot Assess

COOL TOOL RECOMMENDATIONS

Enter details below

Gestational Age >= 35wks * Yes No unknown



Age in Hours *



Acute Perinatal Events Unknown



- Placental Abruption
- Cord Prolapse
- Uterine Distress

Apgar @10min



Worst Cord Blood Gas BaseDef



Infant Blood Gas within 1hr BaseDef



CPR/Epinephrine



Continued need for assisted Yes No unknown

ventilation at 10 mins of life.

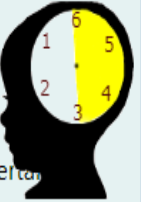


Change Input

Determine Recommendations >>

Recommendations

AT RISK.



Suggested Actions:

1. Consider obtaining infant blood gas, if validity of cord gas result is uncertain (prolonged flow arrest/complete knots)

Refer the table below for suggested action based on neurologic assessment.
For Cooling, consider the **worst exam** after initial resuscitation

Neurologic Assessment Result	Clinical Suggestions
Normal	Screens negative at this time. Symptoms may change. You may perform subsequent neuro exam using NeuroTool . Continue to monitor as per CPQCC guidelines .
Mild	Call cooling center to discuss case. Provide care as per the management guidelines for potential candidates
Moderate to Severe	Call cooling center to discuss the need for transfer and cooling. Provide care as per the management guidelines for potential candidates
Incomplete Exam	Call cooling center to discuss case immediately.

Find Regional Cooling Center

See protocols related to cooling:

Print Report

Disclaimer: These suggested guidelines are not a substitute for clinical judgement.



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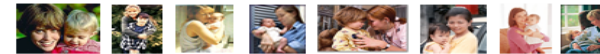


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- Daily hospital updates of Neonatal and High Risk Maternity Beds
- Quarterly reports from Regional CPeTS on Update Compliance
- Quarterly and as needed updates of Contact Information



California Perinatal Transport System



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View Bed Availability - Northern California

To obtain more detailed information about each provider, including contacts and phone numbers, [click](#) on the name of that center in the first column.

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REGIONAL Centers		Beds Available			
Hospital	City	Neonatal	ECMO	High Risk Maternity	Last Update
Anderson Lucchetti Women's & Children's	Sacramento	2	open	open	9/3/2019 7:05:03 AM
California Pacific Medical Center	San Francisco	1	n/a	open	9/3/2019 1:36:24 AM
Children's Hospital Oakland	Oakland	5 or more	open	n/a	9/3/2019 3:00:15 AM
Kaiser Oakland	Oakland	2	n/a	open	8/29/2017 3:00:31 PM
Lucile Packard Childrens Stanford	Palo Alto	5 or more	open	open	9/3/2019 4:53:44 AM
Santa Clara Valley Medical Center	San Jose	5 or more	n/a	n/a	9/3/2019 12:06:05 AM
UC Davis Medical Center	Sacramento	5 or more	open	open	9/1/2019 8:17:50 AM
UCSF Medical Center-Benioff Children's Hospital	San Francisco	5 or more	open	open	9/3/2019 4:13:29 AM
Valley Children's Hospital	Madera	2	open	n/a	9/3/2019 5:30:54 AM

COMMUNITY Centers		Beds Available			
Hospital	City	Neonatal	ECMO	High Risk Maternity	Last Update
Alta Bates Summit Medical Center	Berkeley	5 or more	n/a	open	9/3/2019 1:40:27 AM
Asante Rogue Regional Medical Center	Medford, OR 97504	5 or more	n/a	open	8/30/2019 6:17:14 PM
Community Regional Medical Center	Fresno	1	n/a	open	9/3/2019 12:21:31 AM
DignityHealth /St. Joseph's Medical Center	Stockton 95204	5 or more	n/a	open	9/2/2019 2:49:44 PM
Doctor's Medical Center	Modesto	4	n/a	open	9/2/2019 7:54:43 AM
Dominican-Santa Cruz Hospital	Santa Cruz	5 or more	n/a	open	9/3/2019 1:21:28 AM
El Camino Hospital	Mountain View	5 or more	n/a	open	8/29/2019 9:41:59 AM
Good Samaritan Hospital of Santa Clara Valley	San Jose, 95124	5 or more	n/a	open	9/3/2019 6:03:11 AM
John Muir Medical Center	Walnut Creek	1	n/a	open	8/30/2019 7:50:07 AM

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Direct Referral and Contact Information.

Updated quarterly and as needed by hospitals. Accessed by clicking on facility name in main listing.



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Anderson Lucchetti Women's & Children's

Last updated on 3/13/2019 8:58:10 AM

Hospital: Anderson Lucchetti Women's & Children's

City: Sacramento

Type: REGIONAL

Address1: 2825 Capitol Avenue

Address2: Sacramento, CA 95816

Main NICU telephone/Fax: 916/ 887-0780 fax 916/ 887-0786

Main L&D telephone: 916/ 887-0650

NICU Transport Coordinator

Name: Patty Duncan Phone: 916/ 887-0859 Email: DuncanP@sutterhealth.org

OB Transport

Name: William Gilbert Phone: 916/ 887-0107 Email: GilbertW@sutterhealth.org

NICU Medical Director

Name: Gustavo Sosa Phone: 916/ 887-0104 Email: HaydenN@sutterhealth.org

NICU Nurse Manager

Name: Christi Walsh Phone: 916/ 887-0857 Email: WalshCG@sutterhealth.org

OB Medical Director

Name: Laurie Gregg Phone: [Email: GreggL@sutterhealth.org](mailto:GreggL@sutterhealth.org)

L&D Nurse Manager

Name: Kristi Svej-Stranberg Phone: 916/ 887-0685 Email: SvejStK@sutterhealth.org

Data Contact

Name: Amy Johnson Phone: 916/ 887-4562 Email: JohnsoA@sutterhealth.org

Misc. Info (Web url, other contacts, etc.)

Neonatal Transport referrals, call 916/ 877-0780; Maternal Transport referrals, call 916/ 877-0650; Peds Transport referrals, call 916/ 877-0360

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California Perinatal Transport System



All materials and support documents accessible at perinatal.org website

Hospital and Local EMS Contact Information now available.

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Neonatal Transport Data System

CPeTS Transport paper forms are no longer available from the Regional Offices. Please [download](#) and copy the forms as needed from this [website](#)

2019 Materials

[2019 Neonatal Transport Form](#)(PDF)
[2019 Neonatal Transport Form](#)(Word)
[2019 Neonatal Transport Form Color Coded](#)(PDF)
[2019 Neonatal Transport Form Color Coded](#)(Word)
[2019 CPeTS Manual of Definitions](#)(PDF)
[2019 CPeTS Manual of Definitions](#)(Word)
[2019 CPeTS Data Request Form](#)(PDF)
[2019 CPeTS Data Request Form](#)(Word)

Hospital/EMS Contact List

[Hospital and Local EMS Contact Information Download](#) (PDF)
[Hospital and Local EMS Contact Information Download](#) (Excel)

HOSPITAL AND LOCAL EMS CONTACT INFORMATION

Facility Contact Information

Hospital Community Memorial Hospital of
San Buenaventura
City Ventura
Type COMMUNITY
Address1 147 North Brent Street Ventura,
CA
Address2 Ventura, CA 93003-2854
Main NICU telephone/Fax 805-652-5620
Main L&D telephone

NICU Transport Coordinator

OB Transport

NICU Medical Director

John Van Houten 805 652-5620

NICU Nurse Manager

Deborah J Hill 805 667-2821

OB Medical Director

Local EMS Contact Information

County VENTURA
Director Daniel Shepherd, MD
Address 2220 E. Gonzalez Rd., Ste. 130
City, State, ZIP Oxnard, CA 93036
Phone (805) 981-5304
Email daniel.shepherd@ventura.org
Fax

John_vanhouten@pediatrix.com

djhill@cmhhospital.org

RESOURCES

- Perinatal.org
- CPQCC.org (CPETS REPORTS)
- Southern California CPeTS: 714 921-9755
 - Lisa Bollman: Lisa@perinatalnetwork.org
 - Kevin Van Otterloo: Kevin@perinatalnetwork.org
- Northern California CPeTS: 650 736-2210
 - Rebecca Robinson: rrobinso@stanford.edu
 - Leona Dang-Kilduff: leonad@Stanford.edu
 - Ron Cohen: RSCohen@Stanford.edu

Q&A Session

Panelists

- **Ronald Cohen, MD**, Medical Director, Northern CPeTS
- **Lisa Bollman, RNC, MSN, CPHQ**, Program Director, Southern CPeTS
- **Fulani Davis**, Program Manager, CPQCC NICU/CPeTS Data Center
- **Janella Parucha**, Program Manager, CPQCC NICU/CPeTS Data Center

Closing

Recording and Webinar Evaluation

- An email will be sent out after the webinar with a link to:
 - The slides and webinar recording
 - An evaluation survey
- The webinar recording and slides will also be posted at:
<https://www.cpqcc.org/engage/annual-data-training-webinars-2020>

Upcoming Data Training Webinars

A nurse in blue scrubs is holding a newborn baby in a NICU. In the background, there is a neonatal incubator and various medical equipment.

ANNUAL CPQCC DATA TRAINING WEBINARS

FOURTH WEBINAR IN THE SERIES

What's New with the NICU

Wednesday, October 21st
12:00 - 1:15 PM PDT

cpqcc

A pediatrician in a white lab coat is examining a baby's chest with a stethoscope. A woman is partially visible on the left, looking on.

ANNUAL CPQCC DATA TRAINING WEBINARS

FIFTH WEBINAR IN THE SERIES

What's New with HRIF

Wednesday, October 28th
12:00 - 1:30 PM PDT

cpqcc

<https://www.cpqcc.org/engage/annual-data-training-webinars-2020>

CPQC