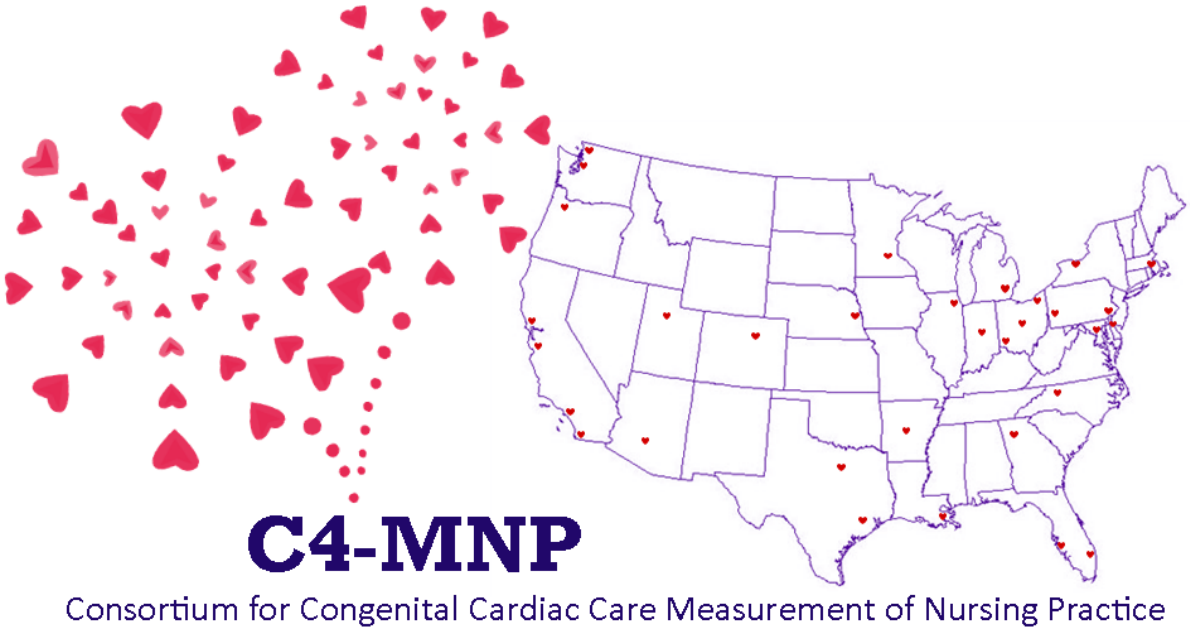
Consortium for Congenital Cardiac Care – Measurement of Nursing Practice

State of Nursing Practice Assessment Aggregate Result Report:

Near Infrared Spectroscopy

July 7, 2020 – August 11, 2020



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Executive Summary

Survey Overview

Near Infrared Spectroscopy (NIRS) is a rapidly advancing analytical technique involving the spectroscopic method. In an effort to define the current state of practice, an electronic survey was developed and sent to 44 intensive care units in free-standing children's hospitals with 28 responses, resulting in a 64% response rate.

Key Findings

All responding nurses (100%) reported their institutions use Near Infrared Spectroscopy for their patients. Respondents overwhelmingly agreed that NIRS provides valuable information for nursing assessment. Responding sites confirmed that substantial variation in practice exists on a national level in regards to guidelines, duration of use, critical values, and reporting.

- 68% of institutions indicated that there is a clinical guideline at their institution regarding the general management of NIRS. All but one follows manufacturer guidelines.
- 68% of respondents use the brand Medtronic Somanetics
- Timeframe for NIRS use varies (multi-response answer):
    - 14% of sites responded a use of 24 hours
    - 21% of sites responded a use of 48 hours
    - 25% of sites responded a use of 72 hours
    - 43% of sites responded a use of < 72 hours
- Reported critical values were widely variant. Sixty-four percent of nurses reported their units do not utilize high critical values. Nurses reported lower critical values for single ventricle compared to biventricular patients.
- Reporting practices among different sites are inconsistent:
    - 68% reported NIRS critical values to a provider often/always
    - 75% reported NIRS change to a provider often/always
    - 86% reported NIRS values often/always during nurse handoff
    - 75% reported discussing NIRS values during round often/always

Conclusion

These findings support the need for further research on Near Infrared Spectroscopy, and the need for further clinical practice guidelines to inform best practices and promote standardization of care. Survey results showed a lack of agreement on high/low values as well as conditions related to low cardiac output. Furthermore, skin breakdown was widely mentioned, but literature and information do not describe this complication. These variations highlight the need for best practices across centers.

Next Steps

Additional areas to explore could include the association between different brands of NIRS and 'normal' trends of values. Further associations could incorporate differences in practice based on years of experience with the device.

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Demographics

1. Please describe your unit.

Respondents (N=28)	
Unit Type	**Frequency (%)**
PICU	24 (85.7)
CICU	3 (10.7)
Mixed ICU (cardiac, medical, surgical, trauma, etc.)	1 (3.6)
Mixed acuity or acuity adaptable	0 (0.0)
Acute care or step-down	0 (0.0)

2. What is your current job title?

Respondents (N=28)	
Job Title	**Frequency (%)**
Staff Nurse	6 (21.4)
Clinical Nurse Specialist	7 (25.0)
Nurse Educator	7 (25.0)
Nurse Practitioner	1 (3.6)
Nursing Scientist	0 (0.0)
Nursing Administrator	2 (7.1)
Other	5 (17.9)

Of the those responding 'Other,' 5 provided other current job titles:

Other Current Job Title
Quality Manager
Nursing Professional Development Specialist
Clinical Nursing Supervisor
CNS with input from NP and bedside RN
CVL RN

3. Please identify how long you have been in this position.

Respondents (N=28)	
Years of Experience	**Frequency (%)**
< 1 Year	1 (3.6)
1-4 Years	11 (39.3)
5-9 Years	6 (21.4)
10-14 Years	4 (14.3)
> 15 Years	6 (21.4)

4. Please identify overall years of nursing experience.

Respondents (N=28)	
Years of Experience	**Frequency (%)**
< 1 Year	0 (0.0)
1-4 Years	0 (0.0)
5-9 Years	5 (17.9)
10-14 Years	7 (25.0)
> 15 Years	16 (57.1)

5. How many beds does your unit have?

Respondents (N=28)	
Number of Beds	**Frequency (%)**
1-10	0 (0.0)
11-20	12 (42.9)
21-30	11 (39.3)
31-40	4 (14.3)
41+	1 (3.6)

Section 1: Policy, Competency, & Management of NIRS

6. Do you use NIRS?

Respondents (N=28)	
NIRS	**Frequency (%)**
Yes	28 (100.0)
No	0 (0.0)

7. What brand of NIRS do you use?

Respondents (N=28)	
Brand of NIRS	**Frequency (%)**
Medtronic	13 (46.4)
Nonin	4 (14.3)
Masimo	2 (7.1)
OxyPrem	0 (0.0)
Other	9 (32.1)

Of the those responding 'Other,' 9 provided other brands of NIRS:

Respondents (N=9)	
Other Brand of NIRS	**Frequency (%)**
Somanetics (covidien somanetics)	5 (55.6)
Covidien, Invos	1 (11.1)
Foresight (casemed foresight)	3 (33.3)

8. How long has NIRS been in use at your institution?

Respondents (N=28)	
NIRS Use	**Frequency (%)**
< 1 year	1 (3.6)
2-4 years	8 (28.6)
5-7 years	10 (35.7)
8-10 years	3 (10.7)
> 10 years	6 (21.4)

9. When NIRS is used on your patients, which of the following probes are used: *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Probes	**Frequency (%)**
Cerebral only	3 (10.7)
Somatic (peri-rental) only	2 (7.1)
Abdominal only	0 (0.0)
Cerebral & Somatic	25 (89.3)
Other Somatic regions	2 (7.1)
All three	1 (3.6)
Other combination	0 (0.0)
Patient dependent	2 (7.1)

10. If patient dependent, please clarify clinical markers for use of one probe over the other, or both:

Respondents (N=2)	
Clinical Markers	**Frequency (%)**
Age	0 (0.0)
Weight	0 (0.0)
Available space on patient	0 (0.0)
Diagnosis	2 (0.0)
Clinical concerns for affected organs	0 (0.0)
Other	0 (0.0)

11. Does a policy or guideline exist at your institution regarding the general management of NIRS?

Respondents (N=28)	
Policy/Guideline	**Frequency (%)**
Yes	19 (67.9)
No	9 (32.1)

12. Are your institution's policies based on manufacturer's guidelines?

Respondents (N=19)	
Manufacturer's Guidelines	**Frequency (%)**
Yes	18 (94.7)
No	1 (5.3)

13. Who is responsible for NIRS documentation and equipment?

Respondents (N=19)	
Responsible	**Frequency (%)**
Respiratory Therapists	0 (0.0)
Nurses	19 (100.0)
Other	0 (0.0)

14. Does your institution have a competency to validate nursing knowledge regarding NIRS?

Respondents (N=28)	
Competency	**Frequency (%)**
Single Competency	12 (42.9)
Annual Competency	0 (0.0)
No Competency	16 (57.1)

15. What environment are NIRS used in? *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Environment	**Frequency (%)**
NICU	10 (35.7)
CICU	26 (92.9)
PICU	18 (64.3)
Stepdown Units	2 (7.1)
Cath Lab	9 (32.1)
Operating Room	19 (67.9)

16. Is the NIRS software interfaced with the EMR?

Respondents (N=28)	
Competency	**Frequency (%)**
Automatically pulled in with vitals	11 (39.2)
Entered manually in EMR	12 (42.9)
Not interfaced with the EMR	5 (17.9)
Other	0 (0.0)

17. What are the clinical indications for use of NIRS? *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Clinical Indications for use of NIRS	**Frequency (%)**
Post-catheterization	8 (28.6)
Post-operative single-ventricle physiology	25 (89.3)
Post-operative two-ventricle physiology	22 (78.6)
Post-cardiac arrest	24 (85.7)
Heart failure	13 (46.4)
Preoperative patients with ductal-dependents defects on prostaglandins	15 (53.6)
Monitoring during natural PDA closure off prostaglandins	11 (39.3)
Clinical prenatal diagnosis for Special Delivery Units	5 (17.9)
ECMO	24 (85.7)
Concern for shock and low cardiac output	21 (75.0)
Gestational age less than 28 weeks	2 (7.1)
Anemia	3 (10.7)
Patient's requiring inotropes	11 (39.3)
Hydrocephalus	0 (0.0)
Concern for seizures	3 (10.7)
Necrotizing enterocolitis	6 (21.4)
Standard of Care	11 (39.3)
Other dx	2 (7.1)

Of the those responding 'Other dx,' 2 provided other diagnoses:

Other Clinical Indications for NIRS
Sepsis, shock, some trauma
Oxygenation issues

18. Are there any situations in which NIRS is not routinely used? *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Not NIRS Routine	**Frequency (%)**
Post-operative with plan for early extubation	7 (25.0)
Lymphatic interventions	6 (21.4)
Procedures performed off-bypass	3 (10.7)
Cardiac catheterization	15 (53.6)
Lung transplant recovering in the CICU	1 (3.6)
Other	10 (35.7)

Of those responding 'Other,' 10 identified other situations where NIRS was not routinely used:

Respondents (N=10)	
Other Routine	**Frequency (%)**
None	6 (60.0)
ECPR	1 (10.0)
Minimum renal NIRS on all infants	1 (10.0)
Often d/c POD#1 if patient stable	1 (10.0)
Potential to not use for non-ductal dependent neonates once anatomy is confirmed by echo	1 (10.0)

19. Which of the following ages of patients are monitored with NIRS? *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Age	**Frequency (%)**
Premature infants	22 (78.6)
Full-term infants	28 (100.0)
Toddlers	27 (96.4)
School age	26 (92.9)
Adolescents	25 (89.3)
Adults	22 (78.6)

Two-Ventricle Defects

20. Cerebral Critical Low

Respondents (N=28)	
Cerebral Low	**Frequency (%)**
< 40	3 (10.7)
< 45	4 (14.3)
< 50	6 (21.4)
< 55	1 (3.6)
< 60	4 (14.3)
None	6 (21.4)
Other	4 (14.3)

Of those responding 'Other,' 4 described other cerebral critical low values:

Other Cerebral Critical Low Value
% decrease
Trend
Provider specific
Values < 50 or values decreased > 20% from baseline

21. Somatic Critical Low

Respondents (N=28)	
Somatic Low	**Frequency (%)**
< 40	3 (10.7)
< 45	3 (10.7)
< 50	6 (21.4)
< 55	2 (7.1)
< 60	2 (7.1)
None	8 (28.6)
Other	4 (14.3)

Of those responding 'Other,' 4 described other somatic critical low values:

Other Somatic Critical Low Value
% decrease
Trend
Provider specific
Values < 50 or values decreased > 20% from baseline

22. Cerebral Critical High

Respondents (N=28)	
Cerebral High	**Frequency (%)**
< 80	3 (10.7)
< 85	0 (0.0)
> 90	4 (14.3)
> 95	2 (7.1)
100	0 (0.0)
None	17 (60.7)
Other	2 (7.1)

Of those responding 'Other,' 2 described other cerebral critical high values:

Other Cerebral Critical High Value
Trend
Values < 50 or values decreased > 20% from baseline

23. Somatic Critical High

Respondents (N=28)	
Somatic High	**Frequency (%)**
< 80	3 (10.7)
< 85	0 (0.0)
> 90	4 (14.3)
> 95	1 (3.6)
100	0 (0.0)
None	18 (64.3)
Other	2 (7.1)

Of those responding 'Other,' 2 described other cerebral critical high values:

Other Somatic Critical High Value
Trend
Values < 50 or values decreased > 20% from baseline

Single-Ventricle Defects

24. Cerebral Critical Low

Respondents (N=28)	
Cerebral Low	**Frequency (%)**
<40	8 (28.6)
<45	4 (14.3)
<50	6 (21.4)
<55	0 (0.0)
<60	0 (0.0)
None	6 (21.4)
Other	4 (14.3)

Of those responding 'Other,' 4 described other cerebral critical low value:

Other Cerebral Critical Low Value
% decrease
Trend
Provider specific
Values <50 or values decreased >20% from baseline

25. Somatic Critical Low

Respondents (N=28)	
Somatic Low	**Frequency (%)**
< 40	7 (25.0)
< 45	4 (14.3)
< 50	4 (14.3)
< 55	1 (3.6)
< 60	0 (0.0)
None	8 (28.6)
Other	4 (14.3)

Of those responding 'Other,' 4 described other cerebral critical low values:

Other Cerebral Critical Low Value
% decrease
Trend
Provider specific
Values < 50 or values decreased > 20% from baseline

26. Cerebral Critical High

Respondents (N=28)	
Cerebral High	**Frequency (%)**
< 80	4 (14.3)
< 85	1 (3.6)
> 90	1 (3.6)
> 95	2 (7.1)
100	0 (0.0)
None	18 (64.3)
Other	2 (7.1)

Of those responding 'Other,' 2 described other cerebral critical high values:

Other Somatic Critical High Value
Trend
Values < 50 or values decreased > 20% from baseline

27. Somatic Critical High

Respondents (N=28)	
Somatic High	**Frequency (%)**
< 80	3 (10.7)
< 85	1 (3.6)
> 90	2 (7.1)
> 95	2 (7.1)
100	0 (0.0)
None	18 (64.3)
Other	2 (7.1)

Of those responding 'Other,' 2 described other cerebral critical high values:

Other Somatic Critical High Value
Trend
Values < 50 or values decreased > 20% from baseline

28. NIRS critical values are reported to a provider (e.g. Resident, NP, PA, Fellow, Attending).

Respondents (N=28)	
Critical Values	**Frequency (%)**
Always	8 (28.6)
Often	11 (39.3)
Sometimes	7 (25.0)
Never	2 (7.1)

29. If NIRS values change, they are reported to a provider.

Respondents (N=28)	
Change	**Frequency (%)**
Always	8 (28.6)
Often	13 (46.4)
Sometimes	6 (21.4)
Never	1 (3.6)

30. NIRS values reported to the oncoming nurse in handoff.

Respondents (N=28)	
Oncoming Handoff	**Frequency (%)**
Always	16 (57.1)
Often	8 (28.6)
Sometimes	3 (10.7)
Never	1 (3.6)

31. NIRS values reported to care team during rounds.

Respondents (N=28)	
Team Rounds	**Frequency (%)**
Always	8 (28.6)
Often	13 (46.4)
Sometimes	7 (25.0)
Never	0 (0.0)

32. Providers write order for the notification of critical high and low of NIRS alarms.

Respondents (N=28)	
Notification	**Frequency (%)**
Always	4 (14.3)
Often	4 (14.3)
Sometimes	7 (25.0)
Never	12 (42.9)
I don't know	1 (3.6)

33. Providers write standing orders for the administration of medications with critical high and low of NIRS alarm.

Respondents (N=28)	
Administration	**Frequency (%)**
Always	1 (3.6)
Often	1 (3.6)
Sometimes	2 (7.1)
Never	24 (85.7)
I don't know	0 (0.0)

34. NIRS trends are analyzed over time.

Respondents (N=28)	
Trends	**Frequency (%)**
Always	12 (42.9)
Often	10 (35.7)
Sometimes	6 (21.4)
Never	0 (0.0)
I don't know	0 (0.0)

Section 2: Care/Maintenance of NIRS

35. What time period is most often used for NIRS? *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Time Period	**Frequency (%)**
24 hours	4 (14.3)
48 hours	6 (21.4)
72 hours	7 (25.0)
> 72 hours	12 (42.9)

36. Does the time period vary based on any of the following reasons? *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Time Period Vary	**Frequency (%)**
Varies by provider	11 (39.3)
Varies by nurse	2 (7.1)
Varies based on clinical indication (post-operative vs post-cath vs level of acuity)	15 (53.6)
NIRS use not determined by a specific time period	10 (35.7)

Of those that selected 'varies based on clinical indication,' these are the explanations for variation by clinical indication:

Clinical Indication Variation
Diagnosis, risk for LCOS or decompensation
Post op and critical condition may warrant longer
Extubated patients will stop NIRS monitoring earlier
In our infant cardiac unit, we typically monitor renal NIRS pre-op. Renal & cerebral post-op and remove cerebral once extubated. Renal typically until all pressors are off. This makes timeframe variable. Some providers for some infants want cerebral pre-op, especially if intubated or critically ill
Usually kept in place in our post-surgical population until they are extubated
For patients on inotropic support, intubated, or post extubation until on low flow cannula and stable
Complexity of surgical procedure. Hemodynamic instability Continue post-extubation if feel patient may not tolerate. Cardiac arrest prevention guidelines
If patient remains hemodynamically unstable with pressor requirement/escalation and/or LCOS, NIRS monitoring will remain on
Patient's course of critical illness will indicates continued use
Typically remove once extubated with the exception of SV neonates

We most frequently use NIRS in our post-operative neonates, generally until approximately 24 hours post-extubation
Patient not doing well, commonly will add NIRS (cerebral mostly) as more data regarding cardiac output status
Varies by acuity of patients' diagnosis and surgical intervention
Diagnosis, procedure, etc.
Usually removed when patient extubated, if patient is unstable (requiring increase in inotropes, continued poor cardiac output) continue for longer time

37. If used post-operatively, how many days post op does NIRS usually remain in place?

Respondents (N=28)	
Post op days	**Frequency (%)**
1-3 days	14 (50.0)
4-7 days	8 (28.6)
8-14 days	0 (0.0)
> 15 days	2 (7.1)
Varies by provider	4 (14.3)
Not used post-operatively	0 (0.0)

38. Does the length of time that NIRS is used differ based on the type of surgery or diagnosis? (If yes, please specify).

Respondents (N=28)	
Type of Surgery/Diagnosis	**Frequency (%)**
Yes	17
No	11

Of those responding 'Yes,' 17 elaborated on if length of time that NIRS is used based on type of surgery or diagnosis:

Length of time NIRS used based on type of surgery or diagnosis
Depends on surgical repair and post-op course/individualized
High risk patients (LCOS, arrest, acute decomp risk), ex. interstage patients
Based on acuity of the patient
Single vs biventricular repairs
Single ventricle patients have NIRS longer. If extubated in the OR, no NIRS
Patients with shunt dependent lesions will have them on longer than those with simple repairs
Patients with fast recovery and no intravenous meds and on RA or low flow cannulas are on NIRS for a shorter amount of time
Varies greatly
If patient remains hemodynamically unstable with pressor requirement/escalation and/or LCOS, NIRS monitoring will remain on

Patients with short CICU length of stay will be transferred to stepdown unit where NIRS monitoring is not performed. (i.e.: stage I may have NIRS for the 10 days in the CICU and an ASD will have NIRS removed on POD 1-2 when transferred to stepdown unit)
Post central shunts vs TGA
Used longer in SV neonates
We most frequently use NIRS in our post-operative neonates, generally in continuous fashion until approximately 24 hours post-extubation. From there it becomes "spot-checks" with assessments and then discontinuation based on nursing judgment/discussion with the medical team
The more complex and especially neonates get NIRS longer. More simple cases, may be on and off in one day - do not use NIRS in our step-down unit
Pump cases or anticipate acute post-operative course
NIRS placement/values, single ventricle, ECMO after surgery, etc.
Maintained longer with tenuous post-op course, generally more complicated surgery/defect = longer use

39. Following probe placement, how long does the cerebral probe remain in place before it is rotated?

Respondents (N=28)	
Cerebral Rotated	**Frequency (%)**
4 hours	1 (3.6)
8 hours	0 (0.0)
12 hours	1 (3.6)
24 hours	3 (10.7)
48 hours	6 (21.4)
No rotation	11 (39.3)
Other duration	6 (21.4)

Of those that responded 'Other duration', 5 described other durations:

Other Duration
5-7 days
As needed, no longer sticking
2 hours
At least once per shift, to be assessed for skin integrity
Every 72 hours

40. Following probe placement, how long does the cerebral probe remain in place before it is replaced?

Respondents (N=28)	
Cerebral Replaced	**Frequency (%)**
24 hours	2 (7.1)
48 hours	6 (21.4)
72 hours	4 (14.3)
4 days	0 (0.0)
5 days	0 (0.0)
6 days	1 (3.6)
7 or greater days	1 (3.6)
No routine replacement	10 (35.7)
Other duration	4 (14.3)

Of those that responded 'Other duration,' 4 described other durations:

Other Duration
5-7 days
As needed, no longer sticking
Probe is changed with site rotation. Probe is not reused
Every 72 hours

41. Following probe placement, how long does the somatic probe remain in place before it is rotated?

Respondents (N=28)	
Somatic Rotated	**Frequency (%)**
4 hours	2 (7.1)
8 hours	0 (0.0)
12 hours	1 (3.6)
24 hours	5 (17.9)
48 hours	4 (14.3)
No rotation	11 (39.3)
Other duration	5 (17.9)

Of those that responded 'Other duration,' 4 described other durations:

Other Duration
5-7 days
As needed, no longer sticking
At least once per shift, to be assessed for skin integrity
Every 72 hours

42. Following probe placement, how long does the somatic probe remain in place before it is replaced?

Respondents (N=28)	
Somatic Replaced	**Frequency (%)**
24 hours	4 (14.3)
48 hours	5 (17.9)
72 hours	4 (14.3)
4 days	0 (0.0)
5 days	0 (0.0)
6 days	1 (3.6)
7 or greater days	1 (3.6)
No routine replacement	10 (35.7)
Other duration	3 (10.7)

Of those that responded 'Other duration', 3 described other durations:

Other Duration
5-7 days
As needed, no longer sticking
Every 72 hours

43. Do you document probe rotation or probe replacement?

Respondents (N=28)	
Document	**Frequency (%)**
Neither	10 (35.7)
Rotation	2 (7.1)
Replacement	9 (32.1)
Both	7 (25.0)

44. Do you use a skin protectant under the NIRS probe?

Respondents (N=28)	
Skin Protectant	**Frequency (%)**
Yes	11 (39.3)
No	17 (60.7)

Of those that responded 'Yes' to using a skin protectant, 11 responded with the types of skin protectant:

Respondents (N=11)	
Skin Protectant Type	**Frequency (%)**
Cavilon	4 (36.4)
Skin protectant applied prior to placement	1 (9.1)
Not specific d/t possibility of change in product	1 (9.1)
"Smith & nephew" skin-prep (inconsistently used)	1 (9.1)
No sting skin barrier	2 (18.2)
No-sting barrier and tegaderm beneath probe for long term use or sensitive skin. otherwise just no-sting and probe placed flush to skin.	1 (9.1)
Mepitel	1 (9.1)

45. When a change in NIRS value occurs in a patient, medications are adjusted:

Respondents (N=28)	
Medication Adjustment	**Frequency (%)**
Always	0 (0.0)
Often	1 (3.6)
Sometimes	19 (67.9)
Never	6 (21.4)
I don't know	2 (7.1)

46. If you answered that medications were adjusted to a change in NIRS values, which medications are typically adjusted? *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Medications	**Frequency (%)**
Inotropes	19 (67.9)
Sedation	14 (50.0)
Analgesics	9 (32.1)
Paralytics	7 (25.0)
Other medications	2 (7.1)

Of those that responded 'Other medications,' 2 specified other medications:

Other Medications
Sometimes fluid bolus, based on full clinical picture
Potentially antiarrhythmics depending

47. When a change in NIRS occurs, ventilator settings are adjusted:

Respondents (N=28)	
Ventilator Settings	**Frequency (%)**
Always	0 (0.0)
Often	0 (0.0)
Sometimes	20 (71.4)
Never	6 (21.4)
I don't know	2 (7.1)

48. Do you believe that any of the following barriers affect the use of NIRS in your practice? *(Note: Column totals exceed 100% due to option of selecting multiple responses)*

Respondents (N=28)	
Barriers affecting use of NIRS	**Frequency (%)**
Limited available skin area	9 (32.1)
Added workload	2 (7.1)
Constant troubleshooting	2 (7.1)
Difficulty adhering to skin	8 (28.6)
No consistency among providers	13 (46.4)
Providers do not use the data when developing plan of care	11 (39.3)
NIRS values do not tend to inform my nursing practices	4 (14.3)
Lack of policies at my institution	6 (21.4)
Lack of NIRS-specific education/training	4 (14.3)
Skin breakdown or injury from probes	9 (32.1)
None	4 (14.3)

Section 3: Nursing Integration of NIRS

49. I believe the NIRS provides valuable information for my nursing assessment and interventions.

Respondents (N=28)	
Valuable Information	**Frequency (%)**
Strongly Agree	12 (42.9)
Agree	12 (42.9)
Neutral	2 (7.1)
Disagree	2 (7.1)
Strongly Disagree	0 (0.0)

50. I believe NIRS is beneficial for my patient.

Respondents (N=28)	
Beneficial for Patient	**Frequency (%)**
Strongly Agree	12 (42.9)
Agree	13 (46.4)
Neutral	2 (7.1)
Disagree	1 (3.6)
Strongly Disagree	0 (0.0)

51. I feel competent in the interpretation of NIRS values.

Respondents (N=28)	
Interpretation	**Frequency (%)**
Strongly Agree	12 (42.9)
Agree	11 (39.3)
Neutral	4 (14.3)
Disagree	1 (3.6)
Strongly Disagree	0 (0.0)

52. NIRS adds to my nursing workload.

Respondents (N=28)	
Workload	**Frequency (%)**
Strongly Agree	2 (7.1)
Agree	5 (17.9)
Neutral	6 (21.4)
Disagree	10 (35.7)
Strongly Disagree	5 (17.9)

53. After completing this survey, are there any other thoughts, questions, or concerns you have regarding the management and use of NIRS? Is there any specific nursing care practice the survey did not address that you would like to share?

Other thoughts/questions/concerns
Additional barrier of NIRS results not auto-entering in EMR.
I can't imagine practicing without them!
We began rotating the somatic probes every 24 hours and rotating left to right due to pressure injuries due to chest edema and poor skin perfusion (this is the MFG recommendations). This has eliminated the problem. The skin issue related to the cerebral probe is related to NPPV full face mask. The goal is not to use cerebral probes unless absolutely needed with scuba mask. We charge for probes through Epic documentation. We have an order set for the monitoring, does not include notification parameters. Does cover frequency of probe changes.
Generally providers ask for a MV sat or additional data when responding to NIRS. In theory it should limit additional diagnostics but sadly it doesn't.
Skin injury prevention requires site assessment every 24hr and sensor replacement every 48hr but site rotation at 24hr is not specified. We also perform device checks every 4hr to ensure patient is not/minimize laying on cables and somatic sensor. Length of monitoring and response to low NIRS and change in baseline varies by provider.
In most patients we remove probes when the patient is extubated and stable. We have poor compliance with setting alarms and having alarms on. In part this is due to the fact that you must have two probes on to have your alarms ON. 50% of the time we only have one cerebral probe on in which case we can't have the audible alarms on.
There is some degree of inconsistent value placed upon the NIRS data I gather on my patient depending on the attending. Some see it as a useful trending device despite the lack of correlation at extreme data points; others see it as "just another number" we gather. I feel very comfortable with the theory of NIRS and how I can "filter" the information I gather to drive home how well - or not - my patient is responding to the regimen we have them on.
Not sure of "Standard of care" definition for the question about clinical indication. Use is determined primarily by patient clinical condition and provider preference, rather than diagnosis, in many cases.