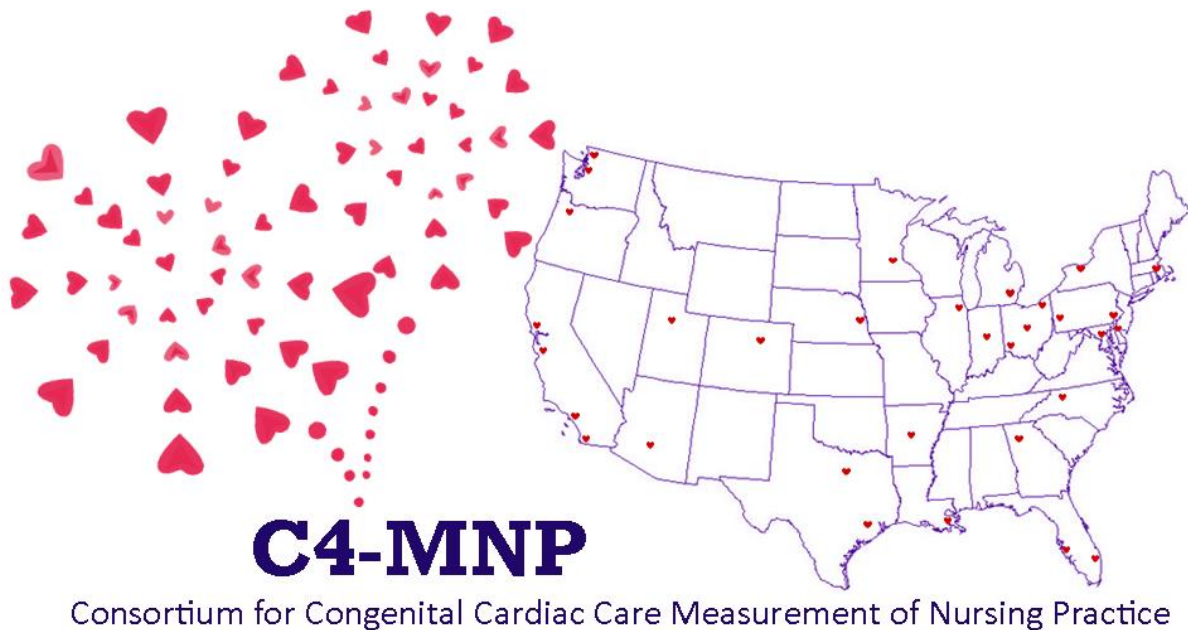


Consortium for Congenital Cardiac Care – Measurement of Nursing Practice

State of Nursing Practice Assessment Aggregate Result Report:

Post Cardiac Catheterization

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Executive Summary

Survey Overview

Pediatric cardiac catheterization has been performed in the United States for over 70 years and the number of cases is increasing. Most literature on post catheter care is adult focused, and the literature supports adult shorter bed rest times post catheterization. In 2013, cardiac catheterization nursing leaders at Boston Children's Hospital created a survey asking, "What is the state of practice for pediatric patients after undergoing cardiac cath?" and sent it out to 118 centers across the United States. Results showed that practices varied across institutions. In 2021, the survey was modified and sent to the Consortium for Congenital Cardiac Care-Measurement of Nursing Practice (C4-MNP). The survey was released 3/15/2021 and closed 6/14/2021. There were 24 responses out of 34 sites (70.6%).

Key Findings

- Most (75%) of the institutions have performed over 300 cases (diagnostic and hemodynamic) per calendar year
- Most (91.3%) institutions use manual compression in order to achieve hemostasis
- Most (75%) of the institutions manage their catheterization sites using some form of pressure dressing containing gauze and either a transparent or foam-like tape product
- All (100%) respondents hold groin pressure on the same catheterization table in which the procedure was performed
- Variation existed among institutions regarding the following:
 - Length of time pressure is applied to the accessed vessel
 - Length of bed rest post catheterization, with a range of between 4 and 6 hours, depending on type of vessel accessed and if heparin was used during the case
 - Nursing protocol to guide length of bed rest times and frequency of vital signs for post catheterization re-bleeds sites
 - Starting point of bed rest

Conclusion

Because of the variations that were found in institutional practices for post cardiac catheterization care among centers in the US, the findings support future work that could focus on informing best practices while promoting standardization of post catheterization care across US institutions, while maintaining patient safety and promoting positive family experience.

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Demographics

1. Is your facility located in the United States?

Respondents (N=24)	
Response	Frequency (%)
Yes	24 (100.0)
No	0 (0.0)

2. If yes, what region of the country is your facility located?

Respondents (N=24)	
Region	Frequency (%)
Northeast (New England/Mid-Atlantic)	6 (25.0)
South (East South Central/West South Central/South Atlantic)	6 (25.0)
Midwest (East North Central/West North Central)	8 (33.3)
West (Mountain/Pacific)	4 (16.7)

3. What is your current job title?

Respondents (N=24)
Administrative Director, Cardiovascular Services (1, 4.2%)
Advanced Practice Nurse (1, 4.2%)
Assistant Nurse Manager Cath Lab (1, 4.2%)
Clinical Nurse Educator (1, 4.2%)
Clinical Coordinator (1, 4.2%)
Clinical Manager (1, 4.2%)
Clinical Practice Manager/Cardiac Cath Lab – Heart Transplant/Heart Failure Service (1, 4.2%)
Clinical Nurse Specialist (1, 4.2%)
Director of Pediatric Nursing Programs (1, 4.2%)
Heart Institute Director (1, 4.2%)
Manager (2, 8.3%)
Nurse Clinician (2, 8.3%)
Nurse Practitioner (3, 12.5%)
Registered Nurse (7, 29.2%)

4. Please identify overall years of nursing experience.

Respondents (N=24)	
Years of Experience	Frequency (%)
< 1 Year	0 (0.0)
1-4 Years	0 (0.0)
5-9 Years	1 (4.2)
10-14 Years	11 (45.8)
> 15 Years	12 (50.0)

5. In your facility, where do your cardiac catheterization patients recover immediately following sedation/anesthesia? (Select all that apply).

Respondents (N=23)	
Location	Frequency (%)
Cath Recovery Area	9 (39.1)
CICU	17 (73.9)
PICU	8 (34.8)
NICU	10 (43.5)
Recovery Room	13 (56.5)
Stepdown	0 (0.0)
Other	1 (4.3)

If other, please specify:

Location (N=1)
PACU (General) (1, 4.3%)

6. How many total cases (including EP, interventional, and diagnostic) has your catheterization lab performed in the last calendar year?

Respondents (N=24)	
Number	Frequency (%)
< 100	3 (12.5)
101-200	2 (8.3)
200-300	1 (4.2)
301-400	4 (16.7)
>401	14 (58.3)

7. How many interventional cases were performed?

Respondents (N=17)	
Number	Frequency (%)
< 100	2 (11.8)
101-200	3 (17.6)
200-300	5 (29.4)
301-400	1 (5.9)
>401	6 (35.3)

8. How many procedure rooms (bi-plane and single plane) are designated for your program?

Cases (N=24)
One bi-plane (1, 8.3%)
One (3, 12.5%)
Two (12, 50.0%)
Three (4, 16.7%)
Four (1, 8.3%)
Five (2, 8.3%)
Unsure (1, 8.3%)

9. Do you have a dedicated nursing staff to care for patients post catheterization?

Response (N=24)
Yes when in cath recovery (1, 8.3%)
Yes (12, 50.0%)
No (11, 45.8%)

Achieving Hemostasis

10. Do you have a routine protocol to achieve hemostasis?

Respondents (N=24)	
Response	Response
Yes	23 (95.8)
No	1 (4.2)

11. Do you reverse heparin at the end of a catheterization procedure after sheath removal?

Respondents (N=24)	
Response	Frequency (%)
Always	0 (0.0)
Most of the time	2 (8.3)
Sometimes	16 (66.7)
Never	6 (25.0)

12. Do you ever use protamine to achieve hemostasis?

Respondents (N=24)	
Response	Frequency (%)
Yes	4 (16.7)
No	5 (20.8)
sometimes	15 (62.5)

13. If protamine is used to achieve hemostasis, what is the prescribed dose?

Response (N=4)
Calculated based on heparin dose given (1, 25.0%)
Not sure –anesthesia uses a formula (1, 25.0%)
Per MD order (1, 25.0%)
In progress (1, 25.0%)

14. Do you check an ACT (activated clotting time) at the end of the catheterization procedure before sheath removal?

Respondents (N=24)	
Response	Frequency (%)
Always	13 (54.2)
Most of the time	6 (25.0)
Sometimes	5 (20.8)
Never	0 (0.0)

15. Is timing of sheath removal at the end of the procedure contingent upon the last ACT?

Respondents (N=24)	
Response	Frequency (%)
No	11 (45.8)
Yes, must be <250	5 (20.8)
Yes, must be <200	6 (25.0)
Other	2 (8.3)

If other, please specify:

Response (N=2)
Depends on patient age (1, 4.2%)
Goal around 200 but varies by case. Not a definite line (1, 4.2%)

16. For patients who receive left-sided ablations, do you use prophylactic anticoagulation after the procedure?

Respondents (N=24)	
Response	Frequency (%)
Yes	16 (66.7)
No	8 (33.3)

17. If yes, do you use:

Respondents (N=15)	
Response	Frequency (%)
Heparin	3 (20.0)
Lovenox	3 (20.0)
Other	9 (60.0)

18. If other, please specify:

Other (N=9)
Aspirin (9, 60.0%)

19. Are there other therapies that you use for patients who receive left-sided ablations?

Respondents (N=24)	
Response	Frequency (%)
Yes	4 (16.7)
No	20 (83.3)

If yes, please specify:

Response (N=3)
Heparin intra-cath (1, 4.2%)
ASA (1, 4.2%)
Echo post-procedure (1, 4.2%)

20. Which method do you use most often to achieve hemostasis?

Respondents (N=23)	
Response	Frequency (%)
Manual Compression	21 (91.3)
Vessel Closure device (ie Perclose, Exoseal, Mynx, other)	0 (0.0)
External Compression device	1 (4.3)
Topical coagulant	0 (0.0)
Other	1 (4.3)

If other, please specify:

Other (N=1)
Manual compression and SafeGuard device (1, 4.3%)

21. If manual pressure is utilized to achieve hemostasis for femoral access, how long is pressure applied.

Respondents (N=24)	
Response	Frequency (%)
Until hemostasis is achieved	15 (62.5)
10 minutes minimum	3 (12.5)
20 minutes minimum	3 (12.5)
Other	3 (12.5)

If other, please describe:

Duration (N=3)
10 minutes for RHC only with no heparin, pull artery hold 3 minutes followed by vein and hold both for 15 minutes minimum. hold 15 minutes on vein when given heparin (1, 4.2%)
15 minimum (1, 4.2%)
20 minutes for arterial and 10 minutes for venous only (1, 4.2%)

22. If manual pressure is utilized to achieve hemostasis for femoral access, who is the person that most often holds pressure? (Select all that apply).

Respondents (N=23)	
Response	Frequency (%)
Attending physician	4 (16.7)
Fellow	8 (33.3)
PA	0 (0.0)
NP	0 (0.0)
Nurse	15 (62.5)
Tech	19 (79.2)
Other	0 (0.0)

23. When is hemostasis achieved?

Respondents (N=24)	
Timing	Frequency (%)
Before extubation	20 (83.3)
After extubation	4 (16.7)

24. When is hemostasis achieved in relation to reversal of sedation/anesthesia?

Respondents (N=24)	
Response	Frequency (%)
Before reversal of sedation/anesthesia	11 (45.8)
After reversal of sedation/anesthesia	3 (12.5)
While sedation/anesthesia is being reversed	10 (41.7)

25. In what location is pressure held?

Respondents (N=24)	
Location	Frequency (%)
On catheterization table	24 (100.0)
On patients bed in RR/PACU/ICU/Floor	0 (0.0)
Other	0 (0.0)

Dressings/Vascular Access Devices

26. Which of the following materials do you use routinely to manage your catheterization sites? (Select all that apply).

Respondents (N=24)	
Probes	Frequency (%)
Pressure dressing (gauze and surgical foam tape)	14 (58.3)
Gauze and transparent film (Tegaderm/Op-site) dressing	16 (66.7)
Topical Hemostasis accelerator	5 (20.8)
Vascular plug or sealer	3 (12.5)
Safeguard dressing	9 (37.5)
External compression device (Fem-stop, sand bags, etc.)	2 (8.3)
Plastic Adhesive dressing (Band-Aid)	7 (29.2)
Other	3 (12.5)

If other, please specify:

Other (N=3)
Transparent film tagederm/opsite, gauze only if significant oozing (1, 4.2%)
Elasticon (1, 4.2%)
Benzoin tincture (1, 4.2%)

Post Catheterization Recovery/Bed Rest

27. Where are patients recovered immediately post catheterization? (Select all that apply).

Respondents (N=24)	
Response	Frequency (%)
General PACU	15 (62.5)
Catheterization lab recovery	8 (33.3)
ICU	16 (66.7)
Inpatient Unit	1 (4.2)
Other	1 (4.2)

28. For patients who had femoral arterial access and received heparin during the procedure, how long is bed rest required?

Respondents (N=22)	
Hours of Bed Rest	Frequency (%)
1	0 (0.0)
2	0 (0.0)
3	0 (0.0)
3 to 4	0 (0.0)
4	9 (40.9)
4 to 6	2 (9.1)
6	11 (50.0)

29. For patients who had femoral arterial access and did NOT receive heparin during the procedure, how long is bed rest required?

Respondents (N=21)	
Hours of Bed Rest	Frequency (%)
1	0 (0.0)
2	0 (0.0)
3	0 (0.0)
3 to 4	0 (0.0)
4	14 (66.7)
4 to 6	2 (9.5)
6	5 (22.8)

30. Are there any other considerations that influence the duration of bed rest post femoral arterial access?

Respondents (N=24)	
Response	Frequency (%)
Yes	20 (83.3)
No	4 (16.7)

31. If yes, what are these considerations? (Select all that apply)

Respondents (N=20)	
Considerations	Frequency (%)
Sheath size	18 (90.0)
Patient age	6 (30.0)
Type of dressing	3 (15.0)
Type of vascular closure device	6 (30.0)
Ability to follow instructions	5 (25.0)
Post catheterization anticoagulation	5 (25.0)
Other	1 (5.0)

If other, please specify:

Other (N=1)
Bleeding (1, 5.0%)

32. For patients who had femoral venous access and received heparin during the procedure, what is the average required bed rest?

Respondents (N=22)	
Hours of Bed Rest	Frequency (%)
1	0 (0.0)
2	2 (10.0)
3	0 (0.0)
3 to 4	1 (5.0)
4	14 (70.0)
4 to 6	1 (5.0)
6	4 (20.0)

33. For patients who had femoral venous access and did NOT receive heparin during the procedure, what is the average required bed rest?

Respondents (N=23)	
Hours of Bed Rest	Frequency (%)
1	1 (4.5)
2	2 (9.1)
3	0 (7.1)
3 to 4	1 (4.5)
4	14 (63.6)
4 to 6	1 (4.5)
6	4 (18.2)

34. Are there any other considerations that influence the duration of bed rest post femoral venous access?

Respondents (N=24)	
Responsible	Frequency (%)
Yes	16 (66.7)
No	8 (33.3)

35. If yes, what are these considerations?

Respondents (N=16)	
Considerations	Frequency (%)
Sheath size	9 (56.3)
Patient age	1 (6.3)
Type of dressing	1 (6.3)
Type of vascular closure device	1 (6.3)
Ability to follow instructions	0 (0.0)
Post catheterization anticoagulation	0 (0.0)
Other	4 (25.0)

If other, please specify:

Other (N=4)	
EP Studies (1, 6.3%)	
Bleeding (1, 6.3%)	
Hemodynamics, palpable pulses and vital signs (1, 6.3%)	
Sheath size, patient age, type of vascular closure device (1, 6.3%)	

36. What is the starting point of bed rest?

Respondents (N=24)	
Response	Frequency (%)
Sheath removal	6 (25.0)
Hemostasis	13 (54.2)
Bandage application	2 (8.3)
Arrival to recovery area	2 (8.3)
Other	1 (4.2)

If other, please specify:

Other (N=1)	
Cardiac PACU (1, 4.2%)	

Hospital Stay

37. What is the usual duration for hospital stay for hemodynamic only catheterizations?

Respondents (N=24)	
Response	Frequency (%)
4 hours	7 (29.2)
6 hours	13 (54.2)
8 hours	1 (4.2)
12 hours	0 (0.0)
Overnight	2 (8.3)
Other	1 (4.2)

If other, please specify:

Other (N=1)
Patients leave 1 hour after flat time is achieved (1, 4.2%)

38. What is the usual duration for hospital stay for routine interventional catheterizations?

Respondents (N=24)	
Response	Frequency (%)
4 hours	1 (4.2)
6 hours	2 (8.3)
8 hours	1 (4.2)
12 hours	0 (0.0)
Overnight	19 (79.2)
Other	1 (4.2)

If other, please specify:

Other (N=1)
Case Specific (1, 4.2%)

Valve insertion:

Respondents (N=22)	
Duration	Frequency (%)
6 – 8 hours	1 (4.5)
Overnight	21 (95.5)

ASD closure:

Respondents (N=22)	
Duration	Frequency (%)
Overnight	21 (95.5)
Outpatient	1 (4.5)

PA dilations:

Respondents (N=23)	
Duration	Frequency (%)
Case specific	2 (8.7)
4-6 hours	2 (8.7)
Overnight	18 (78.3)
Overnight or same day	1 (4.3)

Collateral coiling:

Respondents (N=24)	
Duration	Frequency (%)
4 hours	5 (20.8)
6 hours	2 (8.3)
6-8 hours	1 (4.2)
6 hour or 23 hours	1 (4.2)
8 hours	1 (4.2)
8 – 12 hours	1 (4.2)
Overnight	6 (25.0)
Case specific	2 (8.3)
Duration of bed rest	1 (4.2)
Go home same day	1 (4.2)
Outpatient discharge home	1 (4.2)
Other	2 (8.3)

Other, please describe:

Other (N=2)
Hemodynamic cath in shunt dependent patient 20 hours (1, 50.0%)
PDA closure outpatient discharge home (1, 50.0%)

39. Please describe your routine protocol for vital signs and neurovascular assessments post procedure?

Respondents (N=23)	
Response	Frequency (%)
Q15min x1 hour, Q30min x1 hour, Q1 hour x 1 hour	10 (43.5)
Q 15 min x 1 hour, Q 30 min x 2 hours, Q 1 hour x 1 hour	3 (13.0)
Q 15 min x1 hour, Q 30 min x 1 hour, Q 1 hour x 2 hours	6 (26.1)
Other	4 (17.4)

If other, please describe

Other (N=4)
Q15min x 1 hour, Q30 min x 1hr, Q1 hour for remainder of bed rest, Q2 after bed rest (1, 4.3%)
Q 15 min x 1 hr, Q 1 hr until discharge (1, 4.3%)
q 15 min x 1 hour, q 30 min x 1 hour, and then q 1 hour x 4 hours (1, 4.3%)
Q15 x 1 hour, Q 30 x 2 hours, Q1 x 4 hours (1, 4.3%)

Monitoring

40. Please describe your routine protocol for bed rest post re-bleed?

Respondents (N=24)	
Response	Frequency (%)
Restart bed rest and v/s protocol from beginning	13 (54.2)
Continue with bed rest and v/s from initial hemostasis	2 (8.3)
As clinically indicated per prescriber	7 (29.2)
Other	2 (8.3)

If other, please describe:

Other (N=2)
Hold pressure x 10 min until hemostasis, call cardiologist, lay flat x 1 hr. (1, 4.2%)
Bed rest restarts, continue VS (1, 4.2%)

41. Please describe your routine protocol for vital signs post re-bleed?

Respondents (N=21)	
Response	Frequency (%)
Restart bed rest and v/s protocol from beginning	9 (42.8)
Continue with bed rest and v/s from initial hemostasis	2 (9.5)
As clinically indicated per prescriber	8 (38.0)
Other	2 (9.5)

If other, please describe:

Other (N=2)
Q 15 min until stable, then hourly (1, 4.8%)
Bed rest restarts, continue VS (1, 4.8%)

42. Please describe any additional practices you wish to share

Other (N=1)
Our patients recover in the general PACU then move to a floor for the remainder of their time. Our PICU or NICU patients go back to the ICU after their procedure (1, 50.0%)

43. Please share any suggestions for future survey questions

Other (N=2)
Questions about use of sedation to keep toddlers or uncooperative patients flat (1, 50.0%)
Information on staffing breakdown of RN's/Advanced practice/tech's. Information about alternative access sites (1, 50.0%)