

Application of Kern's framework to development of a family integrated care curriculum for neonatal intensive care units

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To the Editor

Globally, the standard of care in NICUs is rapidly changing to a family integrated care (FICare) approach. FICare is an enhancement to family centred care (FCC) that integrates parents in the neonatal care team with education and support from healthcare providers.¹⁻⁵

There is overwhelming evidence for the positive effects of FICare,⁵⁻¹² which has been linked to infant outcomes of: (1) reduced length of stay without concomitant increases to emergency department visits or readmissions,⁶ (2) increased weight gain velocity,^{5,7} (3) increased breastfeeding rates,^{5,7} (4) decreased duration of supplemental oxygen,⁷ (5) decreased nosocomial infection rates, (6) decreased antibiotic exposure, (7) earlier skin-to-skin, (8) quicker achievement of full enteral feeds, and (9) less time on parenteral nutrition. Parent outcomes include decreased psychosocial distress⁵⁻⁷ and increased confidence.⁶ For the health system, FICare avoids cost.^{7,12} Despite these benefits, variability in its operationalization remains, which may be attributed to ambiguity of what constitutes FICare. The term has been used in reference to several initiatives involving parent empowerment and integration into the care team.^{3,13-17} Furthermore, FICare has been described as a model,^{3,5,6,14,18,19} program,^{20,21} ethos,²² and philosophy of care.^{23,24} An ethos or philosophy of care represent values and guiding principles and may be broadly interpreted, as has been reported with Patient and Family Centered Care (PFCC).²⁵⁻³² Conversely, a model or program are practical approaches that provide guidance and direction on how to successfully deliver services and measure its performance.^{33,34} Operationalization of FICare requires coherence between its characteristics and the practices of providers. Earlier work by our group reported that healthcare providers have a critical need for conceptual and experiential education about FICare.³⁷ While staff education appears to be a necessary condition supporting implementation of FICare, to date,

only one nursing education program to support FICare has been described.³⁶

We used Kern's Framework to develop the Alberta FICare curriculum for multidisciplinary neonatal care providers. Alberta FICare is a model of care that integrates parents into the care of their infant from the time of admission to the NICU. With practical tools and strategies, multidisciplinary neonatal care providers' roles broaden with a focus on educating and supporting parents as they gain knowledge, skills, and confidence in the care of their infant.⁶ Kern's 6-step approach to curriculum development has been applied successfully across multiple specialties³⁸⁻⁴² and includes (1) problem identification and general needs assessment, (2) targeted needs assessment, (3) goals and objectives, (4) educational strategies, (5) implementation, and (6) evaluation and feedback.

Our general needs assessment (step 1) identified that although PFCC is espoused by healthcare systems, as a philosophy, guidelines for PFCC are limited by weak evidence⁴³ and concepts remain fundamentally misunderstood by healthcare providers and families.⁴⁴⁻⁴⁶ A review of the literature showed that educational studies describing training for PFCC practices and FICare in NICUs were lacking.

The targeted needs assessment (step 2) began prior to initiating a cluster randomized controlled trial of Alberta FICare in Alberta, Canada. Interviews with healthcare providers and hospital administrators in level II NICUs found that the complexity of the health system interfered with good intentions and capacity to provide PFCC.⁴⁷ These findings echoed a 2014 report from the Canadian Premature Infants Foundation.⁴⁸ Policies play a significant role in parental access to NICU and participation in neonatal care. Within Alberta's (Canada) health system, Alberta Health Services (AHS), provincial neonatology policies and guidelines are

focused on administration, safety, and clinical care in the areas of transfer, skin assessment, and developmental care, among other things. While a provincial family presence policy⁴⁹ sets the standard for 24/7 family presence in all care settings, there is variation in NICU-specific family presence policies. Rooming in policies and care-by-parent guidelines⁴⁹ are typically limited to supporting parents whose infant will be discharged soon. Indeed, in a post implementation evaluation of Alberta FICare,³⁷ healthcare providers spoke about the need for provincial supports to facilitate parental presence and integration in the NICU.

The goal (step 3) of Alberta FICare training is to teach multidisciplinary neonatal care providers to integrate families into the NICU care team starting from time of admission. To support the FICare change in culture, neonatal care providers receive training in three areas: (1) Relational Communication,¹³ (2) Parent Education, and (3) Parent Support. Curriculum objectives address six CANMeds roles (Communicator, Professional, Scholar, Collaborator, Health Advocate, Leader) and were designed to be specific and measurable across cognitive, affective, and psychomotor domains.

The educational content and strategies (step 4) were selected based on the training objectives and developed using adult learning theory.⁵⁰⁻⁵² Our curriculum is composed of formal, eLearning modules and peer-reviewed journal articles describing the evidence that underpins each component of Alberta FICare. Alberta FICare training translates theoretical concepts to practical strategies and tools. eLearning modules include learning objectives, reflections on experience, activities with immediate feedback, clinical scenarios as examples of Alberta FICare in practice, links to peer-reviewed supporting evidence, and quizzes (passing mark requirement of 80%). Given shift work and busy clinical schedules, training is online and asynchronous to increase cognitive efficiency and minimize demands on learner's attention.⁵³ Providers complete one of two levels of training: (1) Super-Users, who are designated frontline leaders, and (2) End-Users, which includes all multidisciplinary neonatal care providers. It is ultimately the changes in provider practices that (1) enable integration of parents into their infant's NICU care team, (2) standardizes delivery of evidence-informed education, and (3) facilitates psychosocial support for parents. eLearning modules with scientific and andragogically rigorous content are key to provider engagement, reflection, and anticipated adoption into practice.

Implementation (step 5) of eLearning was embedded in the provincial scale and spread of Alberta FICare in 14 NICUs in Alberta,⁵⁴ co-sponsored by Alberta Health and AHS. Alberta FICare demonstrated a positive return on investment for the health system by freeing up costly NICU capacity through reduced length of stay without concomitant increases to emergency department visits or readmissions.¹² Target learners for our curriculum are multidisciplinary neonatal care providers (physicians [neonatologists, pediatricians, clinical assistants], nurses, and allied health)

and their trainees in NICU. The curriculum content was piloted, refined, and eLearning modules were embedded in the learning management systems (LMS) of AHS and its contractor, Covenant Health. NICUs in Alberta have included Alberta FICare training as part of orientation for new nursing hires, as well as fellows and residents. Curriculum content is reviewed annually and updated with emerging evidence.

Curriculum evaluation and learner feedback (step 6) is captured via a secure web-based tool to inform annual improvements to the training.

To the best of our knowledge, this curriculum is the only FICare training that (1) was developed using Kern's framework, (2) targets multidisciplinary NICU staff (physicians, nursing, and allied health), and (3) is accredited for continuing medical education.

Currently, Alberta FICare training is accessible in the province of Alberta. Given demand from neonatal intensive care managers across Canada, efforts are underway to make Alberta FICare training and supporting implementation processes available to neonatal care teams nationally and internationally. Furthermore, adaptation and evaluation for inpatient pediatric settings is underway.

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Conflict of Interest

PZ received salary from the Health Innovation and Implementation (HIIS) Fund for the submitted work and is an employee of Liminality Innovations Inc, a social enterprise working to ensure that Alberta FICare (also known as Merge™) is accessible to NICUs across Canada and internationally. KMB is the CEO and founder of Liminality Innovations Inc. DAM declares no competing interests.

References

1. Benzies KM, Aziz K, Shah V, Faris P, Isaranuwachai W, Scotland J, et al. Effectiveness of Alberta Family Integrated Care on infant length of stay in level II neonatal intensive care units: a cluster randomized controlled trial. *BMC Pediatr.* 2020;20(1):535.
2. Benzies KM, Shah V, Aziz K, Isaranuwachai W, Palacio-Derflinger L, Scotland J, et al. Family Integrated Care (FICare) in level II neonatal intensive care units: study protocol for a cluster randomized controlled trial. *Trials.* 2017;18(1):467.
3. Franck LS, Waddington C, O'Brien K. Family integrated care for preterm infants. *Crit Care Nurs Clin North Am.* 2020;32(2):149-65.
4. O'Brien K, Bracht M, Robson K, Ye XY, Mirea L, Cruz M, et al. Evaluation of the Family Integrated Care model of neonatal intensive care: a cluster randomized controlled trial in Canada and Australia. *BMC Pediatr.* 2015;15:e210.
5. O'Brien K, Robson K, Bracht M, Cruz M, Lui K, Alvaro R, et al. Effectiveness of Family Integrated Care in neonatal intensive care units on infant and parent outcomes: a multicentre, multinational, cluster-randomised controlled trial. *Lancet Child Adolesc Health.* 2018;2(4):245-54.

6. Benzie KM AK, Shah V, Faris P, Isaranuwachai W, Scotland J, Larocque J, et al. Effectiveness of Alberta Family Integrated Care on infant length of stay in level II neonatal intensive care units: a cluster randomized controlled trial. *BMC Pediatr.* 2020;20(1):535.
7. Hei M, Gao X, Li Y, Li Z, Xia S, Zhang Q, et al. Family integrated care for preterm infants in China: a cluster randomized controlled trial. *J Pediatr.* 2021;228:36-43.e2.
8. Murphy M, Shah V, Benzie K. Effectiveness of Alberta Family-Integrated Care on neonatal outcomes: a cluster randomized controlled trial. *J Clin Med.* 2021;10(24):5871.
9. Shafey A, Benzie K, Amin R, Stelfox HT, Shah V. Fathers' experiences in Alberta Family Integrated Care: a qualitative study. *J Perinat Neonatal Nurs.* 2022;36(4):371-9.
10. Dien R, Benzie KM, Zononi P, Kurilova J. Alberta Family Integrated Care and standard care: a qualitative study of mothers' experiences of their journeying to home from the neonatal intensive care unit. *Global Qualitative Nursing Research.* 2022;9:23333936221097113.
11. Moe AM, Kurilova J, Afzal AR, Benzie KM. Effects of Alberta family integrated care (FICare) on preterm infant development: two studies at 2 months and between 6 and 24 months corrected age. *J Clin Med.* 2022;11(6):e1684.
12. Wasylyk T, Benzie K, McNeil D, Zononi P, Osioy K, Mullie T, et al. Creating value through learning health systems: the Alberta Strategic Clinical Network experience. *Nurs Adm Q.* 2023;47(1):20-30.
13. Benzie KM. Relational communications strategies to support family-centered neonatal intensive care. *J Perinat Neonatal Nurs.* 2016;30(3):233-6.
14. Benzie KM, Aziz K, Isaranuwachai W, Palacio-Derflingher L, Scotland J, Larocque J, et al. Family integrated care (FICare) in level II neonatal intensive care units: study protocol for a cluster randomized controlled trial. *Trials.* 2017;18(1):467.
15. Dharmarajah K, Seager E, Deierl A, Banerjee J, Integrated Family Delivered Care core group. Mapping family integrated care practices in the neonatal units across the UK. *Arch Dis Child Fetal Neonatal Ed.* 2020;105(1):111-2.
16. Patel N, Ballantyne A, Bowker G, Weightman J, Weightman S, Helping Us Grow Group (HUGG). Family integrated care: changing the culture in the neonatal unit. *Arch Dis Child.* 2018;103(5):415-9.
17. Banerjee J, Aloysius A, Mitchell K, Silva I, Rallis D, Godambe SV, et al. Improving infant outcomes through implementation of a family integrated care bundle including a parent supporting mobile application. *Arch Dis Child Fetal Neonatal Ed.* 2020;105(2):172-7.
18. O'Brien K, Bracht M, Macdonell K, McBride T, Robson K, O'Leary L, et al. A pilot cohort analytic study of family integrated care in a Canadian neonatal intensive care unit. *BMC Pregnancy Childbirth.* 2013;13 Suppl 1:S12.
19. Moreno-Sanz B, Montes MT, Antón M, Serrada MT, Cabrera M, Pellicer A. Scaling up the Family Integrated Care model in a level IIIC neonatal intensive care unit: a systematic approach to the methods and effort taken for implementation. *Front Pediatr.* 2021;9:e682097.
20. Synnes AR, Petrie J, Grunau RE, Church P, Kelly E, Moddemann D, et al. Family integrated care: very preterm neurodevelopmental outcomes at 18 months. *Arch Dis Child Fetal Neonatal Ed.* 2022;107(1):76-81.
21. Hannan KE, Bourque SL. How does family integrated care in the NICU affect short-term infant and parent outcomes? *Acta Paediatr.* 2020;109(12):2820-1.
22. MacSween K, Fraser C, Clinton T, Clements D, Patel N, McKechnie L. Neonatal healthcare workers' perceptions of the impact of the COVID-19 pandemic. *Acta Paediatr.* 2021;110(10):2814-6.
23. Janvier A, Asaad M-A, Reichherzer M, Cantin C, Bureau M, Prince J, et al. The ethics of family integrated care in the NICU: improving care for families without causing harm. *Semin Perinatol.* 2022;46(3):Article 151528.
24. British Association of Perinatal Medicine. Family integrated care: a framework for practice. 2021. [Cited 15 October 2022]; Available from: <https://www.bapm.org/resources/ficare-framework-for-practice>.
25. Hughes M. Parents' and nurses' attitudes to family-centred care: an Irish perspective. *J Clin Nurs.* 2007;16(12):2341-8.
26. Coyne I. Disruption of parent participation: nurses' strategies to manage parents on children's wards. *J Clin Nurs.* 2008;17(23):3150-8.
27. Coyne I, Murphy M, Costello T, O'Neill C, Donnellan C. A survey of nurses' practices and perceptions of family-centered care in Ireland. *J Fam Nurs.* 2013;19(4):469-88.
28. Lee P. What does partnership in care mean for children's nurses? *J Clin Nurs.* 2007;16(3):518-26.
29. Beck SA, Weis J, Greisen G, Andersen M, Zoffmann V. Room for family-centered care: a qualitative evaluation of a neonatal intensive care unit remodeling project. *J Neonatal Nurs.* 2009;15(3):88-99.
30. Shields L, Nixon J. Hospital care of children in four countries. *J Adv Nurs.* 2004;45(5):475-86.
31. Espezel HJ, Canam CJ. Parent-nurse interactions: care of hospitalized children. *J Adv Nurs.* 2003;44(1):34-41.
32. Ygge BM, Lindholm C, Arnetz J. Hospital staff perceptions of parental involvement in paediatric hospital care. *J Adv Nurs.* 2006;53(5):534-42.
33. Jones AR, Tay CT, Melder A, Vincent AJ, Teede H. What are models of care? A systematic search and narrative review to guide development of care models for premature ovarian insufficiency. *Semin Reprod Med.* 2020;38(4-05):323-30.
34. Gakhal NK. Can we call a model of care a "model" if we cannot measure its performance? *The Journal of Rheumatology.* 2018;45(11):1493-4.
35. Franck LS, Bisgaard R, Cormier DM, Hutchison J, Moore D, Gay C, et al. Improving family-centered care for infants in neonatal intensive care units: recommendations from frontline healthcare professionals. *Adv Neonatal Care.* 2022;22(1):79-86.
36. Galarza-Winton ME, Dicky T, O'Leary L, Lee SK, O'Brien K. Implementing Family Integrated Care in the NICU: educating nurses. *Adv Neonatal Care.* 2013;13(5):335-40.
37. Zononi P, Scime NV, Benzie K, McNeil DA, Mrklas K, Alberta FICare in Level II NICU Study Team, et al. Facilitators and barriers to implementation of Alberta family integrated care (FICare) in level II neonatal intensive care units: a qualitative process evaluation substudy of a multicentre cluster-randomised controlled trial using the consolidated framework for implementation research. *BMJ Open.* 2021;11(10):e054938.
38. Wilson PM, Herbst LA, Gonzalez-del-Rey J. Development and implementation of an end-of-life curriculum for pediatric residents. *Am J Hosp Palliat Care.* 2018;35(11):1439-45.
39. Walsh DP, Neves SE, Wong VT, Mitchell JD. Formation of an intraoperative educational curriculum for anesthesiology residents using a systematic approach. *Anesthesia & Analgesia Practice.* 2020;14(12):e01330.
40. Sawaya RD, Mrad S, Rajha E, Saleh R, Rice J. Simulation-based curriculum development: lessons learnt in global health education. *BMC Med Educ.* 2021;21:33.
41. Leung JS, Brar M, Eltorki M, Middleton K, Patel L, Doyle M, et al. Development of an in situ simulation-based continuing professional development curriculum in pediatric emergency medicine. *Adv Simul.* 2020;5:12.
42. Khamis NN, Satava RM, Alnassar SA, Kern DE. A stepwise model for simulation-based curriculum development for clinical skills, a modification of the six-step approach. *Surg Endosc.* 2016;30:279-87.
43. Davidson JE, Aslakson RA, Long AC, Puntillo KA, Kross EK, Hart J, et al. Guidelines for family-centered care in the neonatal, pediatric, and adult ICU. *Crit Care Med.* 2017;45(1):103-28.
44. Harrison TM. Family-centered pediatric nursing care: state of the science. *J Pediatr Nurs.* 2010;25(5):335-43.
45. McGrath JM, Samra HA, Kenner C. Family-centered developmental care practices and research: what will the next century bring? *J Perinat Neonatal Nurs.* 2011;25(2):165-70.
46. Shields L, Pratt J, Davis LM, Hunter J. Family-centred care for children in hospital. *Cochrane Database Syst Rev.* 2007(1):CD004811.
47. Benzie KM, Shah V, Aziz K, Lodha A, Misfeldt R. The health care system is making 'too much noise' to provide family-centred care in neonatal intensive care units: perspectives of health care providers and hospital administrators. *Intensive Crit Care Nurs.* 2019;50:44-53.
48. Canadian Premature Babies Foundation. Premature birth in Canada: an environmental scan - final report. 2014. [Cited 3 March 2022]; Available from: <https://www.cpbfbpc.org/post/premature-birth-in-canada-an-environmental-scan>.
49. Alberta Health Services. Family presence: designated family/support person and visitor access (policy #HCS-199). 2021 [Cited 9 March 2023]; Available from: <https://extranet.ahsnet.ca/teams/policydocuments/1/clp-prov-visitation-family-presence-focus-pol-hcs-199.pdf>.

50. Knowles MS. Innovations in teaching styles and approaches based upon adult learning. *Journal of Education for Social Work*. 1972;8(2):32-9.
51. Knowles MS. *The adult learner: a neglected species*. Houston, TX: Gulf Publishing Company; 1973.
52. Knowles MS, Holton IE, Swanson RA. *The adult learner: the definitive classic in adult education and human resource development*. Burlington, MA: Routledge; 2005.
53. Grunwald T, Corsbie-Massay C. *Guidelines for cognitively efficient multimedia learning tools: educational strategies, cognitive load, and interface design*. *Acad Med*. 2006;81(3):213-23.
54. McNeil D, Benzie K, Zanoni P, Kurilova J. Alberta Family Integrated Care (FICare): from engaged clinicians in a cluster randomized controlled trial to health system partnership in scale and spread across a province. In: McCutcheon C, Reszel J, Kothari A, Graham ID, editors. *How we work together: the integrated knowledge translation research network casebook*. Ottawa, ON: Integrated Knowledge Translation Research Network; 2021.