

REGISTERED NURSES' ASSOCIATION OF ONTARIO REPORT REVIEW

“Coordinated Care Team Demonstration Project Evaluation”

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GOAL OF THE REVIEW

On June 16, 2009, the Executive Director, Registered Nurses' Association of Ontario, requested an external review and assessment of the report entitled *Coordinated Care Team Demonstration Project Evaluation*, May 2009, by the Toronto East General Hospital.

OBJECTIVES OF THE REVIEW

The external review of the report included the following two objectives.

1. To assess the information provided within the report related to evaluation of outcomes of a pilot where three demonstration units implemented a new model of care called Coordinated Care Teams (CCT).
2. To provide available evidence that informed the substance and methods in this report.

OVERVIEW OF THE COORDINATED CARE TEAM DEMONSTRATION PROJECT REPORT

The *Coordinated Care Team Demonstration Project Evaluation* report describes at a very high level, the process of developing, implementing and evaluating the implementation of CCTs on three care units within one hospital, over a period of approximately 18 months. The design phase was nine months long (Feb-Oct 2008), with implementation commencing November 2008 through March 2009 (p. 8). The evaluation time period was one month in April 2009, with ongoing evaluation and redesign planned to continue after April 2009.

The objectives of the CCT project (p. 7) were to:

1. Deliver **high quality care** within an interprofessional model of care,
2. Ensure every patient is surrounded by a **core team** of providers that utilize a “team lead” role,
3. Enable providers to work to their **full scope** of practice,
4. Ensure care is delivered by the **most appropriate** person at all times, and
5. Ensure a **comprehensive** patient assessment, care plan, and discharge plan.

A principle underlying the CCT was that all providers would work to their full potential and that the right level of care was provided by the right caregiver at all times (p. 5).

The results contained in the evaluation report were reported to be very positive, including the following.

Patient Safety

- Reduction in patient falls
- No incidents of past-admission pressure ulcers
- Slight reduction in mortality rate
- Slight reduction in infection rates for MRSA and C.difficile

Patient Satisfaction

- Increases to many measures of patient satisfaction, including a 24% improvement in nurse availability and 36% improvement in response to patient call bells
- Patient complaints have decreased between 58 to 78% on two units

Resource Use

- Up to 60 minutes more direct care per day per patient
- 20% average reduction in overtime use
- 90%+ average reduction in use of agency staff
- Reduction in use of sick time
- Overall cost reduction ranging up to 6% on one unit

Staff and Physician Satisfaction

- Stable staff satisfaction survey scores
- Stable physician satisfaction survey scores

REVIEW OF THE COORDINATED CARE TEAM DEMONSTRATION PROJECT REPORT

The objectives of the *Coordinated Care Team Demonstration Project* are very generic such that they could lead to any number of different models of care. Both the objectives and the underlying principle are likely to be supported by most healthcare decision-makers today. However, the amount of detail provided in the report about the intervention itself including training procedures, content and expected role descriptions is scant.

Additionally, the reported outcomes are very bold and overall are not substantiated by the data provided in the report. Nor are the reported evaluation procedures and statistics consistent with accepted rigorous research designs. Such rigor is necessary to establish that a change in provider and patient outcomes has actually occurred as a result of an intervention as complex as new roles and ways of working together.

Details related to the two objectives of this review follow.

OBJECTIVE 1 - REPORT INFORMATION RELATED TO EVALUATION OF OUTCOMES

There are several troubling issues within the *Coordinated Care Team Demonstration Project Evaluation Report*. They include the following;

- In the report's description of the issue, there are several references to "decades old approaches to staffing inpatient units" that are implied to be inappropriate or at least no longer relevant (p. 6). Yet, one of the recommendations cited as innovative and leading to increases in patient satisfaction is hourly rounds of patients by the care team, which has been in place for decades in many hospitals.

- The description of the evaluation of the model suggests a research focused approach by referring to a pre-post mixed methods design with a combination of quantitative and qualitative measures, and comparison units and time periods that were selected based on the availability of quality comparison data for the unit and the patient population (p. 9). Yet the report does not provide sufficient information about the characteristics compared with other units, timeframe for data collection, exact measures, sample size for patients and healthcare providers, or unit of analysis. This is a serious omission, since it is not possible to discern whether the sample size yielded sufficient power to appropriately detect an

effect of the intervention. Without information about comparison units (the demonstration units used as their own controls, or other units matched on critical indicators), it is not appropriate to claim that the change in reported outcomes resulted from the intervention (the new model of care). Change in observed data over a small timeframe could be due to random fluctuations, natural progression or the influence of confounding variables rather than the intervention.

- The results reported on pages 10-17 are not consistent with the results reported in the Executive Summary. For example, under patient safety the executive summary reports that mortality rates and infection rates were slightly reduced yet in the body of the report, infection rates remained consistent (p. 10) and there were no changes in patient mortality (p. 11).

Patient Safety Statistics

- The reporting of results varies by observation. For example, infection rates are compared only post implementation to the rest of TEGH and to larger community hospitals in the GTA, yet not to pre-implementation rates on the demonstration units. The statistics here are troubling because it is possible that the rates on the three demonstration units were always lower than the rest of TEGH and to larger community hospitals in the GTA; hence they may have been chosen as demonstration units. Without appropriate reported comparisons, these data can be misleading.

- The data provided for **infection rates** in Figure 2 has no unit of measure so is not interpretable. The report also does not provide patient numbers, co-morbidities, or pre-intervention rates.

- The data for **patient falls** are compared between one unit's data for one month (one patient fall calculated as 2.35 falls per 1,000 patient days) and an internal benchmark of 3.46 falls per 1,000 patient days. What the internal benchmark refers to is not provided. Despite a disclaimer that ongoing evaluation is required due to the short observation period, a claim of reduced patient falls when the order of magnitude is one fall is too far reaching.

- **Patient Mortality** – The science of determining predictors of patient mortality is complex, extensive, and built on years of new knowledge in both substantive and methodological areas. Rigorous research methods require controlling for all potential sources of influence on mortality rates which include patient characteristics, patient comorbidities, organizational and provider characteristics, and characteristics of current care processes and treatment. Use of raw (unadjusted) mortality rates can be exceedingly misleading and meaningless without controlling for potentially confounding variables. Most studies on mortality show that the largest contribution to variance in mortality rates arises from patient characteristics and co-morbidities. Suggesting that mortality rates could change as a result of a one-month pilot of a new model of care is highly unusual.

- **Patient Satisfaction** – This is the most convincing data presented, as it reports patients' perspectives of their satisfaction and availability of nursing staff. It would be helpful to provide baseline data on call bell use since the figure refers in a footnote (p. 12) to a caution that data shows a specific unit had significantly lower call bell use, and therefore further analysis was required into why post-implementation scores were lower than expected. If the rates of call bell use were known and captured electronically, then pre and post implementation rates and times to answer could also be analyzed.

- **Resource Use** - The assumption underlying the presentation of data on p. 13 (no figure name provided) is that hours of care provided by an RN and an RPN are interchangeable. This is seen by the aggregation of hours of care by both groups of nurses. Yet the underlying premise of the new model of care is that

each group works to a unique scope of practice, suggesting that the hours of care for each group should not be equated in a formula.

- The increase in **patient care hours** displayed in Figure 5 are not attributed to any particular class of worker, so the reader is left to assume that it is due to the addition of PCAs (personal care attendants). This should be made explicit.

- **Overtime, agency and illness** – The summarized data provided here would be clearer if additional reference points were indicated – for example, how were the reductions in overtime, sicktime and agency use calculated? The timeframes post implementation would be different for each unit. What were the pre-implementation timeframes and what indicators were compared?

- **Cost of the model** – If the costing model was as detailed as would be required to calculate a change of 6 %, surely it would be possible to clearly assert whether such reductions were due to changes in use of overtime, agency staff or use of sicktime rather than “believed to be”.

- **Staff & Physician Satisfaction** – The presentation of data such as “100% of respondents from F3...” is similarly problematic to other sections of the report because the reader does not know how many respondents were compared to the total sample. It is possible that only the satisfied healthcare providers responded.

OBJECTIVE 2 – EVIDENCE RELATED TO MODELS OF CARE

There is an abundance of literature available on the essential topics in this report that would have informed the development of the CCTs and certainly would have informed the presentation of the results.

Influence of higher nurse education leading to reduced patient mortality

Aiken, L.H., S.P. Clarke, R.B. Cheung, D.M. Sloane, and J.H. Silber. 2003. “Educational levels of hospital nurses and surgical patient mortality”. *Journal of the American Medical Association* 290(12), 1617-1623.

Aiken, L.H., S.P. Clarke, D.M. Sloane, J. Sochalski, and J.H. Silber. 2002. “Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction”. *Journal of the American Medical Association* 288(16), 1987-1993.

Estabrooks, C.A., W.K. Midodzi, G.G. Cummings, K.L. Ricker, and P. Giovannetti. 2005. “Determining the impact of hospital nursing characteristics on 30-day mortality among patients in Alberta acute care hospitals”. *Nursing Research* 54(2), 74-84.

Cho, S.H., S. Ketefian, V.H. Barkauskas, and D.G. Smith. 2003. “The effects of nurse staffing on adverse events, morbidity, mortality, and medical costs”. *Nursing Research* 52(2); 71-79.

Tourangeau, A.E. (2005). “A theoretical model of the determinants of mortality”. *Advances in Nursing Science* 28(1), 58-69.

Tourangeau, A.E., D. Doran, L. McGillis-Hall, L. O’Brien-Pallas, D. Pringle, J. Tu, L. Cranley. (2007). “Impact of hospital nursing care on 30-day mortality for acute medical patients”. *Journal of Advanced Nursing* 57(1), 32-44.

Tourangeau, A.E., P. Giovannetti, J.V. Tu, and M. Wood. (2002). “Nursing-related determinants of 30-day mortality for hospitalized patients”. *Canadian Journal of Nursing Research* 33(4), 71-88.

Registered Nurse (RN) staffing levels and patient outcomes

- Cummings GG, Estabrooks CA, Midodzi W, Wallin L, Hayduk L. (2007). Influence of organizational characteristics and context on research utilization. *Nursing Research*. 56(4, Suppl 1): S24-S29
- Kane et al. (2007). The association of registered nurse staffing levels and patient outcomes: systematic review and meta-analysis. *Medical Care* 45(12): 1195-1204.
- Thungjaroenkul P, Cummings GG, Embleton A. (2007). The impact of nurse staffing on hospital costs and length of stay: A systematic review. *Nursing Economic\$*.25(5):255-265 [Feature continuing education article].

Methods (Controlling for confounding variables)

- Goldstein, H. 1995. *Multilevel Statistical Models* (2nd Ed.). London, Edward Arnold: New York, Wiley.
- Adewale A, Hayduk L, Estabrooks CA, Cummings GG, Midodzi W, Derksen L. (2007). Understanding Hierarchical Linear Models: Applications in Nursing Research. *Nursing Research*. 56(4, Suppl 1): S40-S46.
- Polit, DF, & Beck, CT. (2007). *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. Lippincott Williams & Wilkins.

Predictors of Nurse Absenteeism in Hospitals

- Davey A, Cummings GG, Newburn-Cook C, Lo E. (2009). Predictors of nurse absenteeism in hospitals: A systematic review. *Journal of Nursing Management*. 17, 312-330

ADDITIONAL COMMENTS

In addition to issues of science, there are numerous spelling and typographical errors in the report which suggest an unfortunate level of inattention to detail (e.g. mangers rather than managers, Appendicies rather than Appendices). For another example, Methodology is not only spelled incorrectly, but is also used inappropriately. Methodology is the study of a method. The authors of this report should be using Methods to describe the procedures they used. Another example -- nurses “working “to their full potential” is used synonymously with “working to their full scope”, where the former is relevant to the individual nurse and the latter refers to the legislated and structured role in the profession.

Appendix 1: The source of the information in the appendix should be listed, included if the authors developed it. However, the terminology is different in this figure than the rest of the report, with the use of PSWs, and HCAs rather than PCAs used in the body of the report.

Appendix 2: The unit composition of the Core Team would be more meaningful if the number and acuity of patients were also provided.

Appendices 4 & 5: The calculation of response rates here is not at all clear. True response rates are calculated by dividing the number of surveys distributed to the entire sample by the number returned. The total number of participants by unit is not provided in this report, so it is not possible to calculate the response rate or assess whether the response is biased or not.

Appendix 6 – It appears that this information was useful in modifying the implementation of the model of care and suggests the use of an iterative process to implementation.

IMPORTANT INFORMATION MISSING FROM THE CCT REPORT

Some of the most important information that is missing from the CCT report relates to the impact of a change to the model of care on the functioning and relationships of the team. Having three different roles (RN, RPN, and PSW) each providing a component of nursing care can lead to fragmentation of care, omissions and safety issues for patients. Our work has shown that collaboration among registered nurses is vital to ensure the use of research findings in practice, patient safety and prevention of adverse patient events. Dr. Linda Aiken's work has shown that appropriate registered nurse staffing levels are required for monitoring patients care needs that when unmet, lead to preventable deaths. There is no evidence that implementing models of care such as the CCT will improve satisfaction of nurses, or maintain quality care for patients. Yet, we have an abundance of evidence that registered nurse (RN) staffing provides both quality and cost-effective care.

SUMMARY

The *Coordinated Care Team Demonstration Project Evaluation* report suggests a concerted effort to present positive trends from a pilot study when in fact no significant differences may yet be seen or even exist. This is not unexpected as achieving significant changes to complex outcomes is overly optimistic from a very short implementation timeframe (1-3 months). It would be more appropriate to identify which specific outcomes are sensitive to the implementation of models of care, in the short term, moderate and long term. Certainly changes to nurse absenteeism, patient mortality and infection rates are downstream long term indicators of complex systems that include work environments, and organizational and individual characteristics that are not easily amenable to change.