Social Programs That Work Review

Evidence Summary for the Transitional Care Model

HIGHLIGHTS:

- **PROGRAM:** A nurse-led hospital discharge and home follow-up program for chronically ill older adults.
- **EVALUATION METHODS:** Two well-conducted randomized controlled trials (RCTs).
- **KEY FINDINGS:** 30-50% reduction in rehospitalizations, and net savings in health care expenditures of approximately $4,500 per patient, within 5-12 months after patient discharge.

I. Evidence rating: TOP TIER

The standard for Top Tier is:

Programs shown in well-conducted RCTs, carried out in typical community settings, to produce sizable, sustained effects on important outcomes. Top Tier evidence includes a requirement for replication – i.e., the demonstration of such effects in two or more RCTs conducted in different implementation sites, or, alternatively, in one large multi-site RCT. Such evidence provides confidence that the program would produce important effects if implemented faithfully in settings and populations similar to those in the original studies.

II. Description of the Program:

The Transitional Care Model is designed to prevent health complications and rehospitalizations of chronically ill, elderly hospital patients by providing them with comprehensive discharge planning and home follow-up, coordinated by a master's-level "Transitional Care Nurse" who is trained in the care of people with chronic conditions. At the time of hospitalization, the Nurse: (i) conducts a comprehensive assessment of the patient's health status, health behaviors, level of social support, and goals; (ii) develops an individualized plan of care consistent with evidence-based guidelines, in collaboration with the patient and her doctors; and (iii) conducts daily patient visits, focused on optimizing patient health at discharge.

Following discharge, the Nurse conducts periodic home visits and/or scheduled phone contacts with the patient based on a standard protocol. In Study 1 (below), the post-discharge program lasted three

months, and included an average of 12 home visits, with no scheduled phone contacts. In Study 2 (below), it lasted approximately one month, and included an average of 4.5 home visits and weekly Nurse-initiated phone contacts with patients or family caregivers. In both cases, the Nurse was also available to patients via telephone seven days per week.

Two main focuses of the Nurse home visits and phone contacts are: (i) identifying changes in the patient's health and (ii) managing and/or preventing health problems, including making any adjustments in therapy in collaboration with the patient's physicians. The Nurse also accompanies the patient to her first physician visit following hospital discharge to ensure effective communication.

Each Nurse handles a caseload of 18-20 patients. The Transitional Care Model replaces the hospital's usual discharge-planning and post-discharge activities. Its cost ranges from $519 per patient (in Study 2) to $1,160 per patient (in Study 1), in 2017 dollars.[1]

Click here to go to the program's website.

III. Evidence of Effectiveness:

This summary of the evidence is based on a systematic search of the literature, and correspondence with leading researchers, to identify all well-conducted randomized controlled trials of the Transitional Care Model. Our search identified two such studies. The following summarizes the Model's effects on the main outcomes measured in each study, including any such outcomes for which no or adverse effects were found. All effects shown are statistically significant at the 0.05 level unless stated otherwise.

STUDY 1 (Six Philadelphia Hospitals)

This was a randomized controlled trial of 239 elderly hospital patients with heart failure in six Philadelphia academic and community hospitals, carried out from 1997 to 2001. The study's focus on heart failure is important because it is the leading cause of hospitalization in patients age 65 and older in the United States [Levitt et. al., AHRQ, 2009], and heart failure patients have the highest 30-day rehospitalization rate (27%) of any Medicare patient group [Jencks et. al., 2009].

All sample members were: (i) 65 years of age or older and able to speak English; (ii) alert and oriented; (iii) living at home within 60 miles of their admitting hospital; and (iv) willing to participate in the study. Sample members were randomly assigned to (i) the Transitional Care Model, or (ii) a control group that received the hospital's standard care and discharge planning and, if referred, skilled home health services (e.g., more than half received referrals for skilled nursing or physical therapy).

[1] This cost estimate includes compensation for the Nurse after patient discharge but not before, since the Nurse's pre-discharge activities substitute for the hospital's standard discharge planning. The estimate also does not include the cost of pharmaceuticals, assistive devices, other supplies, or the Nurses' one-month training in the Model. This same cost formula was used in estimating the net savings from the Model, shown later in this summary.

The sample was 57% female, 64% white, and 36% African American, and averaged 76 years of age. 44% had not completed high school.

Effects of the Transitional Care Model one year after patients' hospital discharge (versus the control group):

- 22% reduction in the likelihood of rehospitalization or death (47.5% of the Transitional Care Model group were rehospitalized or died during the year versus 61.2% of the control group).
- 34% reduction in the average number of rehospitalizations per patient (0.88 for the Transitional Care Model vs. 1.34 for the control group). Although not clearly reported, this effect appears to be significant at the 0.10 level, but possibly not the 0.05 level.
- 38% reduction in average number of days hospitalized during the year (5 days vs. 8 days). This effect was significant at the 0.08 level, but not the 0.05 level.
- $4,560 net savings in health care expenditures per patient, including rehospitalizations, acute care visits, and home visits (expenditures of $8,094 vs. $12,654, in 2017 dollars). The study does not clearly report the statistical significance of this estimate, but it appears to be at least close to significance at the 0.05 level.
- Significant improvement in patient satisfaction with care at the two points it was measured (two weeks and six weeks post-discharge). The magnitude of this effect is unclear because the study measured satisfaction with an index that does not lend itself to ready interpretation.
- No significant effect on patient mortality, and few significant effects on quality of life or functional status.

Discussion of Study Quality:

- The study had low sample attrition for its main outcomes (patient rehospitalizations, deaths, and health care costs): Data on these outcomes were obtained for 79% of the Transitional Care Model group and 80% of the control group at the one-year follow-up.[2]
- At the start of the study, the Transitional Care Model and control groups were highly similar in their observable characteristics (e.g., demographics, health, prior health care utilization).
- The study measured outcomes for all sample members assigned to the Transitional Care Model group, regardless of whether or how long they received program services (i.e., the study used an "intention-to-treat" analysis).
- The study measured health care utilization and costs using patients' records and bills, and applying standardized Medicare reimbursement rates.

[2] Due largely to patient death, sample attrition at the one-year follow-up was higher for two of the other outcomes – patient functional status and satisfaction with care. For these outcomes, data were obtained for 61-62% of the original sample, with little difference in attrition rate between the Transitional Care Model and control groups.

- The study measured patients' quality of life, functional status, and satisfaction with care through phone interviews with patients, conducted by research staff who were blind as to which patients were in the Transitional Care Model group versus control group.

- This was a multi-site study evaluating the Transitional Care Model with a standardized implementation in both academic and community hospitals.

STUDY 2 (Two Philadelphia Hospitals)

This was a randomized controlled trial of 363 elderly hospital patients in two urban, academically-affiliated hospitals in Philadelphia, carried out from 1992 to1996. Unlike study 1 (above), which focused on heart failure patients, this study sample had been admitted for a variety of medical conditions and procedures typical of elderly hospital patients (e.g., heart failure, heart attack, coronary bypass, respiratory infection, bowel procedure, hip replacement). All sample members were (i) 65 years of age or older and able to speak English; (ii) alert and oriented; (iii) living at home within the hospitals' service area; (iv) at-risk for poor post-discharge outcomes (because, for example, they were age 80 or older, or had multiple recent hospitalizations, multiple chronic health problems, or functional impairment); and (v) willing to participate in the study.

Sample members were randomly assigned to (i) the Transitional Care Model, or (ii) a control group that received the hospital's standard care and discharge planning and, if referred, home care consistent with Medicare regulations.

The sample was 50% male, 55% white, and 45% African American, and averaged 75 years of age. 47% had not completed high school. Their most frequent reason for hospital admission was congestive heart failure (30% of the sample).

Effects of the Transitional Care Model 24 weeks (i.e., 5.5 months) after patients' hospital discharge (versus the control group):

- 45% reduction in the likelihood of rehospitalization (20.3% of the Transitional Care Model group were rehospitalized at least once during the 24 weeks vs. 37.1% of the control group).

- 52% reduction in the average number of rehospitalizations per patient (0.28 for the Transitional Care Model group vs. 0.58 for the control group).

- 63% reduction in the average number of days hospitalized during the follow-up period (1.5 days vs. 4.1 days).

- $4,521 net savings in health care expenditures per patient, including rehospitalizations, acute care visits, and home visits (expenditures of $5,415 vs. $9,936, in 2017 dollars).

- No significant effects on patient mortality, functional status, depression, or satisfaction with care.

Discussion of Study Quality:

- The study had low-to-moderate sample attrition for its main outcomes (patient rehospitalizations, deaths, and health care costs): Data on these outcomes were obtained for 76% of the Transitional Care Model group and 80% of the control group at the 24-week follow-up.[3]
- At the start of the study, the Transitional Care Model and control groups were highly similar in their observable characteristics (e.g., demographics, health, prior health care utilization).
- The study measured outcomes for all sample members assigned to the Transitional Care Model group, regardless of whether or how long they received program services (i.e., the study used an "intention-to-treat" analysis).
- The study measured health care utilization and costs using patients' records and bills, and applying standardized Medicare reimbursement rates. The study measured patients' functional status, depression, and satisfaction with care through phone interviews with patients. Research staff obtaining both types of outcome data were blind as to which patients were in the Transitional Care Model group versus control group.
- A limitation of this study is that both of the hospitals where it was conducted are academically-affiliated, suggesting the need for replication in other types of hospitals to see if the results generalize. (Study 1 above provides such replication.)

OTHER STUDIES

Two other randomized controlled trials evaluated earlier versions of the Transitional Care Model. Their findings are not summarized here because these earlier versions did not include any home visits after hospital discharge, and so differ substantially from the current version of the Model. In addition, there has been a randomized controlled trial of the Transitional Care Model for cognitively-impaired elderly patients, which reported positive findings, but we do not summarize it here due to weaknesses in the study's design (random assignment of only three hospitals) that limit confidence in its results.

IV. References:

Study 1 – (Six Philadelphia Hospitals, published 2004):

Naylor, Mary D., Dorothy A. Brooten, Roberta L. Campbell, Greg Maislin, Kathleen M. McCauley, and J. Sanford Schwartz. "Transitional Care of Older Adults Hospitalized with Heart Failure: A Randomized, Controlled Trial." *Journal of American Geriatric Society*, 2004, vol. 52, no. 7, pp. 675-684.

[3] Due to patient death, sample attrition at the 24-week follow-up was higher for other outcomes measured – patient functional status, depression, and satisfaction with care. For these outcomes, data were obtained for 70-75% of the original sample, with little difference in attrition rate between the Transitional Care Model and control groups.

Study 2 – (Two Philadelphia Hospitals, published 1999):

Naylor, Mary D., Dorothy Brooten, Roberta Campbell, Barbara S. Jacobsen, Mathy D. Mezey, Mark V. Pauly, and J. Sanford Schwartz. "Comprehensive Discharge Planning and Home Follow-up of Hospitalized Elders: A Randomized Clinical Trial." *JAMA*, 1999, vol. 281, no. 7, pp.613-620.

Naylor, Mary D. and Kathleen McCauley. "The Effects of a Discharge Planning and Home Follow-Up Intervention on Elders Hospitalized with Common Medical and Surgical Cardiac Conditions." *The Journal of Cardiovascular Nursing*, 1999, vol. 14, no. 1, pp. 44-54.

Other References:

Naylor, Mary D., Karen Hirschman, Alexandra Hanlon, Kathryn Bowles, Christine Bradway, Kathleen McCauley, and Mark Pauly. "Comparison of Evidence-Based Interventions on Outcomes of Hospitalized, Cognitively Impaired Older Adults." *Journal of Comparative Effectiveness Research*, 2014, vol. 3, no. 3, pp. 245-257.

Jencks, Stephen, Mark Williams, and Eric Coleman. "Rehospitalization Among Patients in Medicare Fee-For-Service Program." *New England Journal of Medicine*, 2009, vol. 360, no. 14, pp. *1418*–1428.

Levit K., L. Wier, E. Stranges, K. Ryan, A. Elixhauser. *HCUP Facts and Figures: Statistics on Hospital-based Care in the United States, 2007.* Rockville, MD: Agency for Healthcare Research and Quality, 2009, pp. 23-24.

Naylor, Mary D., P. Feldman, S. Keating, M.J. Koren, E.T. Kurtzman, M. Maccoy, and R. Krakauer. "Translating Research Into Practice: Transitional Care for Older Adults." *Journal of Evaluation in Clinical Practice*, 2009, vol. 15, pp. 1164-1170.

Naylor, Mary D., Dorothy Brooten, Robert Jones, Risa Lavizzo-Mourey, Mathy Mezey, and Mark Pauly. "Comprehensive Discharge Planning for the Hospitalized Elderly: A Randomized Clinical Trial." *Annals of Internal Medicine*, 1994, vol. 120, pp. 999-1006.

Naylor, Mary D. "Comprehensive Discharge Planning for Hospitalized Elderly: A Pilot Study." *Nursing Research*, 1990, vol. 39, no. 3, pp. 156-161.