

Planetree

Planetree Implementation Improves Quality Outcomes

by Susan Stone, PhD RN
Chief Nurse and Operating Officer
Sharp Coronado Hospital

The link between patient-centered care and quality outcomes such as patient satisfaction, length of stay, readmission, productive nursing hours per patient day and cost per case has been postulated, however to date little to no research has been conducted examining this issue. Examining the effect of Planetree patient-centered care on inpatient quality outcomes was the focus of a recent research project.

The Idea:

To use existing information collected over the past five years on patient satisfaction, length of stay, readmission, and cost per case data to compare the experience of one hospital that implemented Planetree at the start of this period to another similar hospital that had not. Assuming an equivalence between these two hospitals, the difference in outcomes between these would provide a measure of the effect of Planetree on inpatient quality. The following questions were addressed: (1) what is the impact of the Planetree patient-centered model of care on patient satisfaction, (2) what is the impact of the Planetree patient-centered model of care on clinical outcomes (length of stay and readmission), and (3) what is the impact of the Planetree patient-centered model of care on the cost of providing care (cost per case and productive nursing hours per patient day).

The Measures:

Patient satisfaction with the hospital stay was measured using the overall survey score and composite scores including admission, room, meals, nurses, tests and treatments, visitors and family, physician, discharge and personal issues on the Press Ganey inpatient satisfaction tool. Length of stay was measured in hours from the date and time

of admission through date and time of discharge. Hospital readmission (a dichotomous variable yes/no) within thirty days of discharge was the measure for readmission. Cost per case was measured as the average direct expense per discharged inpatient minus the cost of the prosthetic joint implant. Direct expenses do not include any overhead (indirect) expenses. Productive nursing hours per patient day was measured as the number of worked, direct care-giving nursing hours per census day. A census day was measured for each inpatient in a bed at midnight. Hours included in the calculation are straight-time, over-time, double-time, and call-back hours (if a nurse was on-call). Excluded was training, meeting, sick, on-call, vacation, or any other paid time where staff is not present (i.e. jury, bereavement).

What We Did:

By comparing similar units (caring for the same types of patients, using the same skill mix) managed by the same organization, (with standardized organizational pay rates, supply costs, policies, procedures, contracts and regulatory compliance programs) we were provided a unique opportunity to evaluate the impact of the Planetree patient-centered model of care on inpatient quality outcomes.

The Planetree inpatient hospital began its implementation in 2002. It was a 30 bed medical surgical telemetry unit located within a small 46 acute care and 158 long term care bed community hospital with less than one hundred acute care beds. The comparison inpatient unit was a 22 bed surgical telemetry unit located within a large 464 bed metropolitan community hospital with greater than three hundred licensed acute care beds.

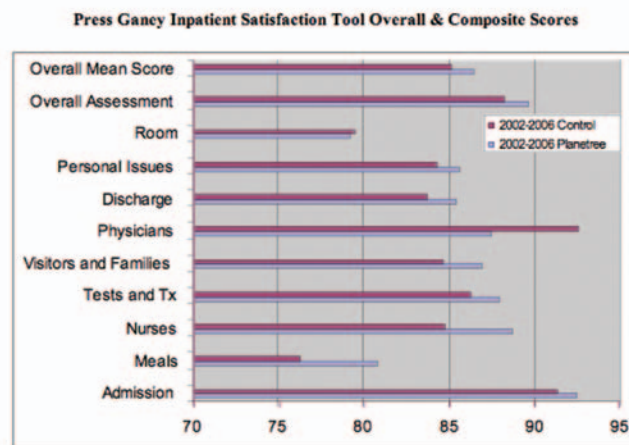
The Data:

Patients over age 18, who underwent primary elective surgical knee or primary hip total joint re-

placement between 1/2002 and 12/2006 and who also completed the English language post-discharge patient satisfaction survey were included in the study. The sample size consisted of 869 total patients, 67.5% n=587 patients in the Planetree unit and 32.5% n=282 in the control unit. Of the 869 patients 43% n=375 were men and 57% n=494 were women. In the Planetree unit 63% n=370 of patients were women as compared to the control unit where 56% n=158 of patients were men. Patients in the Planetree unit were only slightly older with 89.2% n=524 ranging in age from 56-85 as compared to the control unit with 93.3% n=263 of patients ranging in age from 46-85. Patients in both units had nearly equivalent mean ages and self reported health status. The mean age in the Planetree was 67.3 as compared to 64.4 in the control unit and both groups reported an equivalent health status (4.2 = good).

Results:

Research Question #1: What is the Impact of the Planetree Patient-Centered Model of Care on Patient Satisfaction



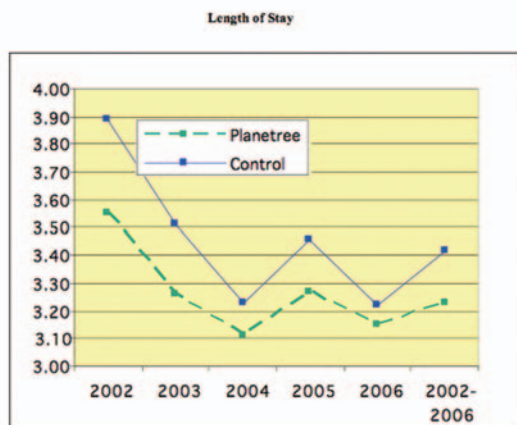
When the scores over the five years are taken together, the marginal means for the Planetree unit were higher than the control unit on all but two dimensions. Statistical significance (defined as $p < .05$ with Eta Squared = $> .01$) was demonstrated

Quality Outcomes

both in the meals and nurses composite categories in individual yearly comparisons and in the summary year's comparison. In the Planetree unit the individual yearly areas of significance included: (1) the 2003 meals composite mean scores with a larger mean of 78.797 as compared to 72.468 for the comparison unit, (2) the 2006 meals composite mean scores with a larger mean of 83.349 as compared to 77.083 for the comparison unit, (3) the 2002 nurses composite mean scores with a larger mean of 90.741 as compared to 76.967 for the comparison unit and (4) the 2003 nurses composite mean scores with a larger mean of 87.386 as compared to 81.208 for the control unit. In addition to these specific years, the meals and nurses cumulative 2002-2006 composite mean score comparison was also statistically higher in the Planetree unit. While not all the composites areas demonstrated statistical significance, it should be noted that the Planetree unit demonstrated a greater percentage (>60%) of higher mean scores in 9 of 11 or 81.8% composite categories in the annual and summary mean score composite comparisons. This evidence supports the assessment that the Planetree patient-centered model of care treatment unit implementation had a positive impact on patient satisfaction scores.

Research Question #2: What is the Impact of the Planetree Patient-Centered Model of Care on Length of Stay and Readmission

We looked at mean length of stay over the five years and found differences between the Planetree



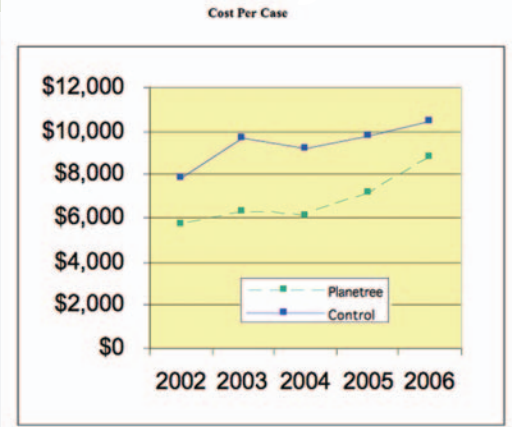
and control unit. Statistical significance was demonstrated in the 2003 comparison when the Planetree unit's mean length of stay was 3.26 as compared to the control unit's 3.51. In addition, in each of the five annual mean lengths of stay comparisons the Planetree unit consistently demonstrated a lower mean length of stay. This evidence again provides additional support that the implementation of Planetree's patient-centered model of care had a positive impact on length of stay.

This difference however did not carry over to the outcome of readmission. In our analysis, we found no significant difference between the two units. This is not surprising, because both units participate in organization-wide orthopedic total joint replacement clinical pathways and case management practices have been adopted. In addition, patient's self reported health status was equivalent in both units.

Research Question #3: What is the Impact of the Planetree Patient-Centered Model of Care on Cost per Case and Productive Nursing Hours per Patient Day

The cost per case analysis demonstrated that the Planetree unit was different from the control unit with a statistically significant lower cost per case in every year 2002-2006. While both units demonstrated an increase in cost per case, the Planetree unit consistently maintained a statistically significant lower cost per case nearly proportional to the control unit.

When comparing the mean length of stay trends and the cost per case trends it is important to note the nearly identical mirror image trends verifying that length of stay is a major contributor to the cost per case. The lower length of stay in the Planetree unit contributed greatly to the lower cost per case. In addition, the Planetree unit slightly reduced the higher cost average RN productive hours per patient day through an increased use of lower cost personnel (clerks, aides and LVNs). This evidence suggests that the Planetree patient-centered model of care treatment unit implementation had a posi-



tive impact on cost per case. Further evaluation is required to verify the key processes on the Planetree unit associated with this lower length of stay.

Next Steps:

Continued work needs to be done on developing and collecting consistent pre-implementation and post-implementation data so that meaningful comparisons of quality outcome measures may be made. The proliferation of publicly reported quality outcome data will assist in this effort, however, in addition it is recommended that hospitals and healthcare systems develop, implement and maintain standardized clinical and financial historical archives as a part of the Planetree patient-centered model of care implementation process.

The assessment of productive nursing hours per patient day was limited to a visual comparison rather than a statistical analysis due to a lack of comparative historical information. When developing financial historical archives hospitals and healthcare organizations are encouraged to collect pay period to pay period nursing hours per patient day information. Examination of the variation in skill mix and hours per patient day would provide a better understanding of how the Planetree patient-centered model of care can be most efficiently and effectively implemented.

Because of the limited retrospective convenience sample involved in this study the findings cannot be generalized. Additional research is needed to assess the impact of Planetree's patient-centered model of care in and amongst different settings including, but not limited to; hospital units, patient populations, levels of care, outpatient and primary