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**The Connection of Strong Social Support with Joint Replacement Outcomes**

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## Introduction

Contemplating surgery can be daunting. Shortened hospital stays also add to anxiety and it becomes more important to ensure that patients have the education and support necessary to properly prepare for upcoming surgery and ultimately, to help them achieve the best possible surgical outcomes. Several studies in literature demonstrate the positive effects of pre-operative education, while other studies show how strong social support helps patients during hospitalization and the post-operative recovery period. A multi-disciplinary, multi-hospital team working to improve the care that orthopedic patients receive during the continuum of care and to improve their post-operative outcomes wanted to determine if this knowledge could be used to benefit orthopedic patients.

Previous studies have clearly demonstrated a link between social relationships and patient outcomes. Social support, measured in various ways, has been shown to be associated with mortality<sup>1</sup>, mental health<sup>2</sup>, stress<sup>3</sup>, and depression<sup>4</sup>. Most recently, a 2008 Mitchinson et al study, published by the *Journal of the American College of Surgeons*, demonstrated associations between social support and depression, anxiety, pain, opiate use, and length of stay among major thoracic/abdominal surgery patients. They concluded that “Limited social connectedness impacts negatively on the quality and rate of recovery after major operations, regardless of post-operative complications”.<sup>3</sup> They further said that patients with limited social connectedness will likely require additional pain medication and vigilance by physicians and caregivers.

Prouty, Cooper et al looked at the relationship between total joint replacement patients and found a positive relationship between pre-operative education and post-operative levels of pain and anxiety; so much so that they felt that patients should be encouraged to bring a family member, caregiver or what we called “coach” to the pre-operative education class in order to be better prepared pre-, peri- and post-operatively.<sup>5</sup> Results from Jester, 2003, Johansson et al, 2002 and Ottenbacher et al., 2002<sup>8</sup>; to name a few, also support various elements of the “coach” concept.

Van den Akker-Scheck et al noted that perceived social support was an important factor in a joint replacement patient's recovery and that hospital nurses tended to determine the amount of social support a patient had by the number of visitors they had.<sup>9</sup> They developed a tool, the Groningen Orthopaedic Social Support Scale, to reliably measure social support for arthroplasty patients in Holland.

Van den Akker-Scheek et al went further and later developed the Groningen Orthopaedic Exit Strategy (GOES).<sup>10</sup> Their hypothesis stated that "higher self-efficacy, more social support and better pain-coping result in a quicker and more efficient rehabilitation, which must become noticeable in an improved ability to resume activities of daily living (ADL), a higher level of physical activity, and a better health-related quality of life." They developed a six month support program for all patients deemed eligible for the short-stay program; these patients were discharged on post-operative day five.

While literature showed that *social support* could play a significant role in the success of an arthroplasty patients' recovery, there were no studies found that articulated the role a 'coach' and how a coach could provide the necessary *social support* to help ensure successful and rapid recovery.

A review of literature provided an adequate foundation for studying *social support* within the team. The team hypothesized that internal outcome measures would be associated with varying levels of social support and that the role of a *coach* may be an effective means to strengthen social support levels. Representation on the team included orthopedic nursing, rehabilitation, physician, and an outcomes analyst. The team developed the following Opportunity Statement, "To define, measure, and implement a progressive family/friend support system across the continuum of care promoting optimal patient recovery after total joint arthroplasty".

## Materials and Methods

Utilizing a *Plan-Do-Check-Act* Quality methodology, the team outlined the following key objectives, Define *social support*, Measure to quantify current levels of *social support* and assess correlations to outcomes,

Determine root cause theories for inadequate *social support*, Implement a strategy to improve *social support* (Table 1).

To develop an internal working definition of *social support*, the team drew from their findings in the literature and solicited input from other total joint centers to guide in identifying key attributes that describe *social support*. Literature review suggested that optimal *social support* had five important **attributes**: *Social support needs* extend and change across the continuum of care ; must address varying types of needs( tangible , informational , validation needs, emotional needs.<sup>11,12</sup> Well-defined supportive behavior preferred<sup>12</sup>; quality is more important than quantity<sup>11,13</sup>; and independence should always be the goal.

The following questions helped guide which measures were valuable to collect: What is the level of *social support* for our joint replacement patients? Are family/friends *present* at key points before and after surgery? (Surgeon's office visit (pre-op), Pre-Op Class, Surgery Pre-Op Holding, Last PT Class in Hospital, During Discharge Instructions). As well as, is level of *social support* associated with Mobility Achievement Post-Surgery, Length of Stay, Morbidity Rates, Patient Satisfaction, and Confidence & Readiness for Discharge, or Discharge Destination?

To capture the elements of *social support* as defined above, the team selected the *Groningen Orthopedic Social Support Scale (GO-SSS)*, a 12-item self-reporting tool. It was developed and tested for validity and reliability in the Netherlands and designed specifically for the total hip and knee arthroplasty population. Approval for usage was obtained by contacting one of the authors. A few modifications were made, with permission, to allow for application in our context. We utilized the English translation of the tool and modified the response scale for enhanced sensitivity and scale balance. The tool's verb tense and wording was also slightly modified to assess how *prepared* patients were for post-discharge social support. The original tool was designed to assess social support either during or after the hospital stay. Our team utilized it on the *day of discharge*. With the exception of one question, agreement analysis demonstrated (using kappa statistics) that sufficient agreement was present between day-of-discharge *perception* and *actual* post-discharge social support one week later. For reference purposes, the

modified tool was called the *Modified Groningen Social Support Scale (MGO-SSS)*. In addition to the 12 *MGO-SSS* questions, the team added two additional outcome indicators: *overall patient satisfaction* and *confidence and readiness to go home*. Finally, five family/friend presence indicators were added to later associate with the total *MGO-SSS* score. Although the original Dutch version was found valid and reliable, future testing is recommended for the English version with the modified questions/response scales. Appendix A contains the *Modified Groningen Social Support Scale (MGO-SSS)*.

Premier *Quality Manager*, a risk-adjustment analytics program, was utilized to assess the impact of *social support* level on length of stay, complication rates, and morbidity rates. Premier utilizes proprietary disease-specific risk-adjustment models developed from approximately 600 hospitals and 14 million patient records, to adjust for greater than 15 patient factors.

Other measures, such as ambulation, transfer-out-of-bed, and discharge status, were captured manually and entered into Microsoft Access relational databases. SAS Analytical Software was utilized to compile, analyze, and report results.

Four of our hospitals conducted initial measurement using the *MGO-SSS*. From a scale of 0 (no *social support*) to 100 (optimal *social support*), the average total score was 87.2 (ranging by hospital from 85.9 to 88.9). The original development of the *GO-SSS* did not define acceptable thresholds of performance. By comparison, however, a 2007 study published by the Orthopedic Department of the University Medical Center Groningen, Netherlands reported their 'control group' total score for hip/knee replacements of 70.1 (n=103). Comparative ability, however, may be suspect since the study measurement occurred on day of admission versus day of discharge, and our team utilized a slightly modified version of the tool. Nonetheless, the team believed that attaining higher levels of *social support* was achievable. A goal of 90 or higher was established.

*Cause & Effect Analysis* conducted by the team revealed four common theories as to why family/friend support is inadequate. The 3<sup>rd</sup> and 4<sup>th</sup> root cause theories (below) were largely considered outside of the

control of the team. Although physicians and patients could be educated and encouraged to solicit family/friend support, the ultimate decision of family/friend involvement was up to the patient.

A substantial portion of the implementation plan, therefore, addressed the 1<sup>st</sup> and 2<sup>nd</sup> root cause theories since the team could more clearly define what *social support* looks like, and elevate its value and importance among patients, families, and physicians. (See Table 1) To impact the root cause theories, the team developed the following strategies, which were designed to define and raise the awareness of sufficient *social support*, especially from a quantitative and literature-based perspective. The effectiveness of the strategy rested primarily with the physician. If it was a priority to the physician, it would become a priority to the patient. (See Table 2)

## Results

Over a period of 24 months, a convenience sample of 1,722 primary hip and knee patients was captured on the day of discharge. This represents a response rate of 30% (1,722 / 5,834).

Scores from the *Modified Groningen Social Support Scale (MGO-SSS)* were scaled from 0 (No support) to 100 (very high support). These were also categorized into four levels: 0 – 32: *No/Low Support*, 33 – 66: *Moderate Support*, 67 – 89: *High Support*, 90 – 100: *Very High Support*. MGO-SSS scores were then associated with key outcome measures. Caution should be exercised for strata with low sample sizes.

*Length of stay* was lower for patients with high or very high levels of *social support* (*t-test*  $pv < .0001$ ). This finding was generally consistent across hospitals, procedures, and gender (Figure 1).

*Risk-adjusted* length of stay also demonstrated better outcomes for patients with high levels of *social support* (Figure 2). *Premier Quality Manager* was used and controlled for more than 15 patient characteristics. Expected LOS was based on the top 15% best hospitals nationally, as identified by Premier. Extreme outliers were removed and geometric means were utilized. Patients with high & very high levels of social support observed lower than expected lengths of stay ( $pv < .05$ ). Differences in risk-adjusted morbidity (serious complications) and mortality were also assessed but not discernable among *social*

*support* levels due to no mortalities occurring during the 24 months and very low morbidity rates across all *social support* levels (1.3% or less).

*The percentage of patients discharged home* was greater for patients with higher levels of *social support* (*MH Chi-Sq pv < .0001*) (Figure 3). This finding was generally consistent across procedures, hospitals, and gender. One hospital was the exception because of their emphasis on discharging all patients home. Inversely, percentage of patients discharged to a skilled nursing facility decreased as *social support* level increased.

Ambulation distance was assessed after surgery. *The percentage of patients achieving the ambulation goal* was modestly higher for patients with higher levels of *social support* (*MH Chi-Sq pv = .0001*) (Figure 4). This finding was more pronounced for primary hips over primary knees, and for females over males. Two hospitals achieved high ambulation scores across all levels of *social support*.

Transfer Out-of-Bed (TOOB) ability was assessed after surgery. *The percentage of patients achieving the TOOB goal* was marginally higher for patients with higher *social support* (*MH Chi-Sq pv = .0027*) (Figure 5). This finding was more pronounced for primary hips over primary knees, for females over males, and for one hospital.

Patients were asked on the day of discharge, "Overall, would you rate the quality of care provided at our hospital as ... [excellent, very good, good, fair, or poor]? The percentage of 'excellent' was calculated. *The percentage of patients reporting 'excellent' to quality of care* was higher for patients with higher levels of *social support* (*MH Chi-Sq pv < .0001*). This finding was consistent across procedures, hospitals, and gender (Figure 6.).

Patients were asked on the day of discharge, "Overall, do you feel confident and ready to go home completely, mostly, somewhat, or no. The percentage of 'completely confident' was calculated. *The percentage of patients reporting 'completely' confident & ready to go home* was higher for patients with higher levels of *social support* (*MH Chi-Sq pv < .0001*) (Figure 7). This finding was consistent across procedures, hospitals, and gender.

After implementation, the team monitored *social support* over time. Marginal improvement was observed in the total *MGO-SSS* score, and also in item response for preparation for transportation, meals and chores. Current levels of *social support* are high to very high (Figure 8). Additional improvements are planned, particularly around the role of the physician. This role is pivotal in early emphasis of the value and importance of strong *social support* for the patient.

## Discussion

The results of this study replicated and validated the importance of quality *social support* for total joint replacement surgery patients. Intervals were identified during the surgical experience at which *social support* has significant impact on quality metrics and patient outcomes. The outcome measures that were associated with strong *social support* include length of stay, mobility, the perception of care, discharge disposition, and confidence and readiness to be discharged home.

In studying patients with inadequate *social support*, females accounted for most cases (73%). A contributing reason was that men were more likely to be married than women at the time of surgery, hence having a greater opportunity for optimal *social support*. Strategies to enhance support for women, particularly older women, merit discussion beyond the scope of this study.

Findings in this study are limited to that of a large retrospective convenience sample (n=1,722). While not a randomized prospective study, results proved consistent across four hospitals, two procedures (primary hip and knee), and gender. Although similar to the original tool, further study to evaluate the validity and reliability of the *Modified Groningen Social Support Scale* is recommended. While literature has demonstrated the benefits of effective *social support* in other patient populations, extending this analysis to other patient populations would be of value.

It is noteworthy that other benefits of quality *social support* can result. Nurses and physical therapy staff consistently noted that an effective coach promoted an 'enhanced safety net' and a smoother transition at discharge. Although not directly measured in this study, effective *social support* was observed to



strengthen patient advocacy, reduce patient anxiety, improve management of pain, aid in information retention, and enhance timeliness of meeting patient needs.

Healthcare is facing its most challenging times. Quality outcomes and transparency of those outcomes achieved in an economical fashion has become an expectation for organizations and physicians alike. These factors will be key for survival as the industry moves into Medicare break-even and other cost-reduction models to provide services. The need for physicians and hospitals to understand the importance of encouraging quality *social support* from family and friends during the surgical experience is a valuable element in achieving positive patient outcomes, particularly as reimbursement and resources become increasingly constricted. Beyond metrics and cost, quality *social support* from friends and family is simply the best course for patients.

#### Conclusion

Key quality and outcome metrics are measurably and consistently improved with the presence of quality *social support*. These include length of stay (both unadjusted & risk-adjusted), achieving ambulation and transfer out of bed goals, patient perception of overall quality of care, percentage of patients discharged to home, and patient confidence & readiness to go home.

Three intervals were found to be significant predictors of key outcome measures: family/friend presence during the **pre-op class**, family/friend presence in the **pre-op holding area** prior to surgery, and family/friend presence during the **last physical therapy session**. These intervals may serve as reasonable *social support* proxies for organizations desiring to measure *social support* to ultimately affect quality and outcomes.

## References

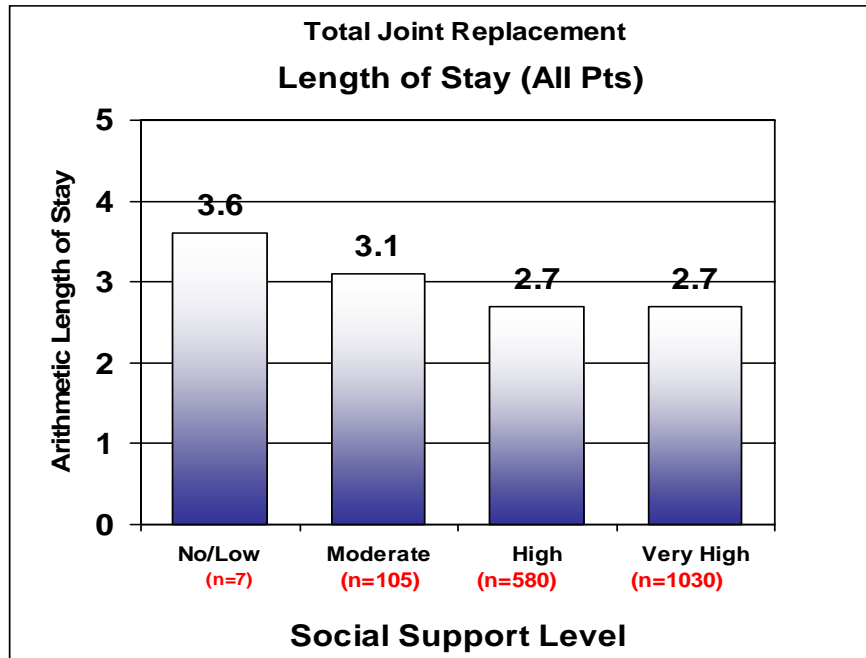
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**TABLE 1**

Root Cause	Solution (What)	Solution (How)
1. Family/Friend Support Is Not Well Defined	<p><b>1.1 Define Family/Friend Support</b></p> <p><b>1.2 Create Key Documents For Communication</b>  <u>Key Coach Documents:</u>            1. Coach Difference/Research Says            2. Coach Attributes            3. Ten Coaching Goals            4. Coach Guide (tri-fold)            5. Coach Badge</p> <p><b>1.4 Process Changes to Better Accommodate the Coach</b></p>	<p>1.1.1 Articulate Key Roles &amp; Responsibilities (10) (at macro level; micro is facility-specific)</p> <p>1.1.2 Include Critical Components From Literature/Data Analysis</p> <p>1.2.1 Develop these documents</p> <p>1.2.2 Test documents with patients/input from staff, physicians, &amp; Home Health</p> <p><u>System-Wide</u></p> <p>1.4.1 Provide free meals &amp; snacks for Coaches</p> <p>1.4.2 Provide sleep-over ability</p> <p>1.4.3 Free parking</p> <p>1.4.4 Coach Identification Badge</p> <p><u>Facility-Specific</u></p> <p>1.4.5 Facilities can implement other ideas specific to their facility.</p>
2. Family/Friend Support Is Not Viewed as Important to Physicians, Patients, Families, and Staff	<p><b>2.1 Educate MD's and Staff about importance</b></p> <p><b>2.2 Emphasize importance of Coach with patient/family</b></p>	<p>2.1.1 Provide the evidence (Lit/Data Analysis) and Key Coaching Documents to Ortho Chairs and MDs</p> <p>2.1.2 Educate physicians</p> <p>2.1.3 Develop plan and educate the staff:            - Setting the Coach's expectations            - How staff acknowledges/ engages/utilizes the Coach</p> <p>2.1.4 Ask for physician &amp; staff commitment to emphasize importance in office visit and accommodate Coaching role in hospital.</p> <p>2.1.5 Provide '<i>social support</i>' results by physician and communicate to them.</p> <p>2.2.1 Physicians to <b>emphasize</b> in office</p> <p>2.2.2 Develop <b>coach wording</b> when class is scheduled with patient (provide to Healthsource &amp; pre-surgical svcs)</p> <p>2.2.3 Pre-op Orientation Class to emphasize (with Key Coach Documents)</p>
3. Patient Does Not Want To Ask For Help	<p><b>3.1 Emphasize importance of Coach with patient/family</b></p>	<p>3.1.1 Same as 2.2.1 and 2.2.2 above</p>
4. Family/Friend Is Unavailable or Unwilling to Help	<p><b>4.1 Encourage patient to pursue finding a person to adequately support them</b></p>	<p>4.1.1 Patient to hire inquire with family, church, social group, professional hire, etc.</p>

**FIGURE 1**



<b>Hospital</b>	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
<b>IAH</b> (n=435)	4.3	3.6	3.1	3.0
<b>IMV</b> (n=621)		2.7	2.4	2.4
<b>IFH</b> (n=280)	3.0	3.1	2.7	2.6
<b>IFO</b> (n=401)		2.7	2.6	2.7

<b>Gender</b>	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
<b>Female</b> (n=1010)	3.6	3.1	2.8	2.7
<b>Male</b> (n=712)	3.5	3.2	2.5	2.6

\*\*\*need to change IAH, etc....into Hospital A, B, C.....

Figure 2

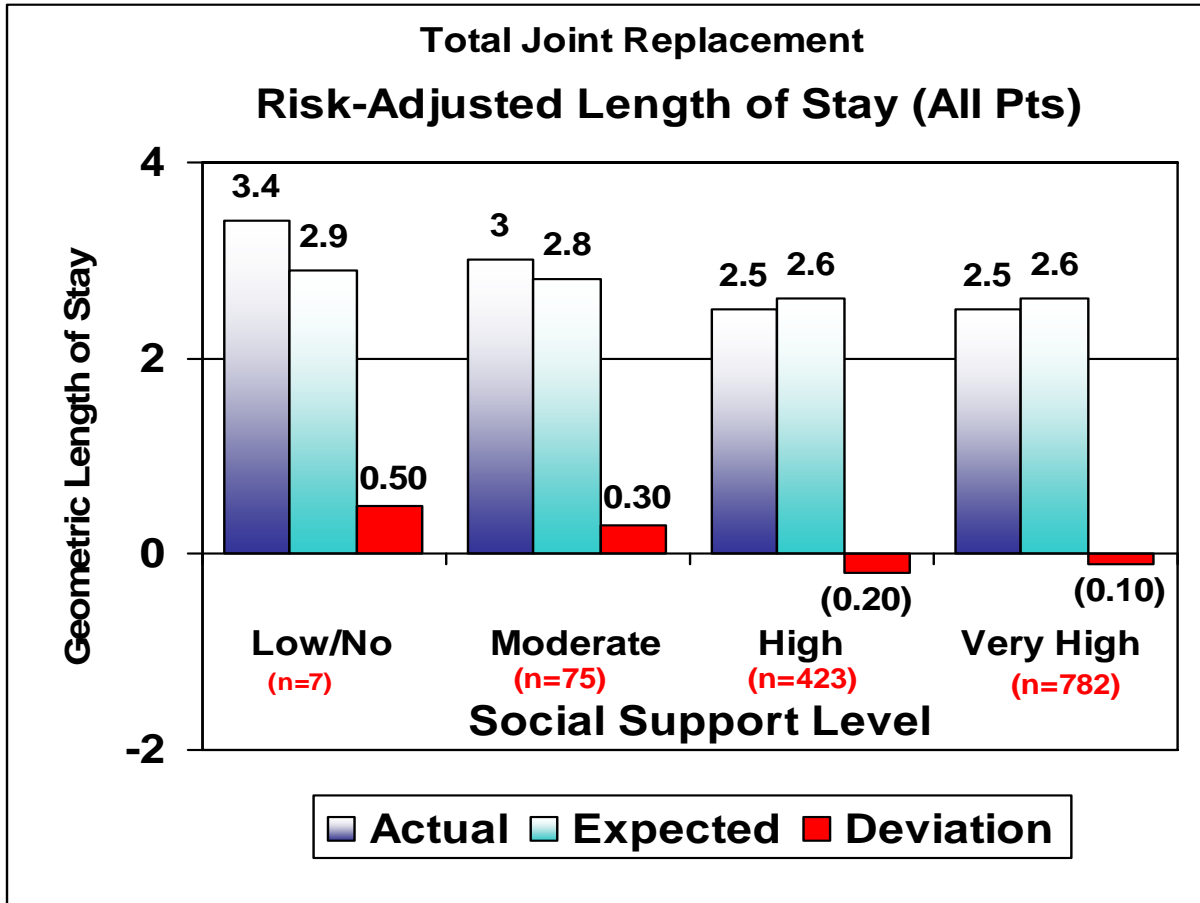
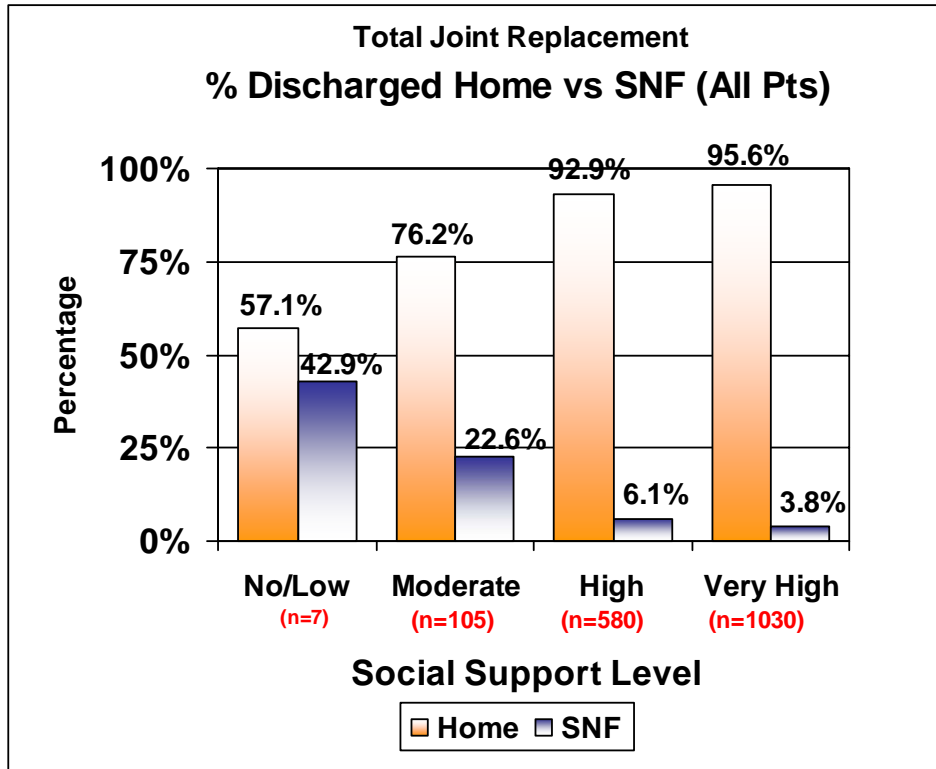
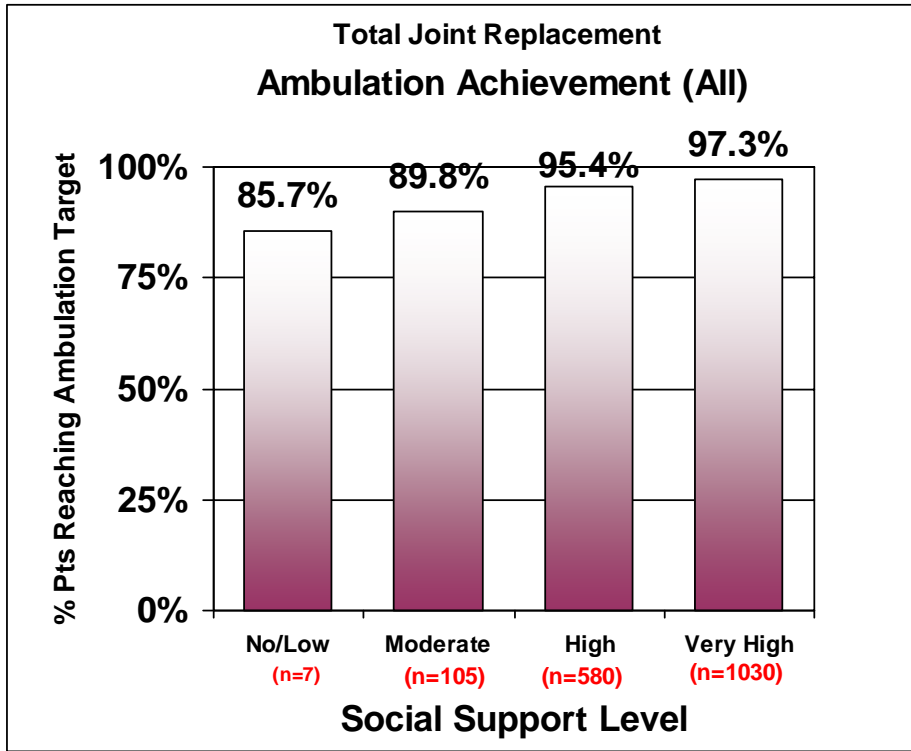


FIGURE 3



<b>Procedure (% Home)</b>	<b>Low/No Support (0-32)</b>	<b>Moderate Support (33-66)</b>	<b>High Support (67-89)</b>	<b>Very High Support (90-100)</b>
<b>Primary Hip 81.51</b> (n=618)	50.0%	72.5%	92.7%	94.3%
<b>Primary Knee 81.54</b> (n=968)	75.0%	75.0%	92.5%	96.2%
<b>Hospital (% Home)</b>	<b>Low/No Support (0-32)</b>	<b>Moderate Support (33-66)</b>	<b>High Support (67-89)</b>	<b>Very High Support (90-100)</b>
<b>IAH</b> (n=435)	50.0%	57.5%	82.0%	89.6%
<b>IMV</b> (n=621)	100% (n=1)	100%	100%	99.5%
<b>IFH</b> (n=280)	50.0%	93.3%	91.9%	98.8%
<b>IFO</b> (n=401)		72.0%	91.9%	94.3%
<b>Gender (% Home)</b>	<b>Low/No Support (0-32)</b>	<b>Moderate Support (33-66)</b>	<b>High Support (67-89)</b>	<b>Very High Support (90-100)</b>
<b>Female</b> (n=1010)	40.0%	72.7%	90.1%	95.1%
<b>Male</b> (n=712)	100% (n=2)	85.7%	97.0%	96.2%

FIGURE 4



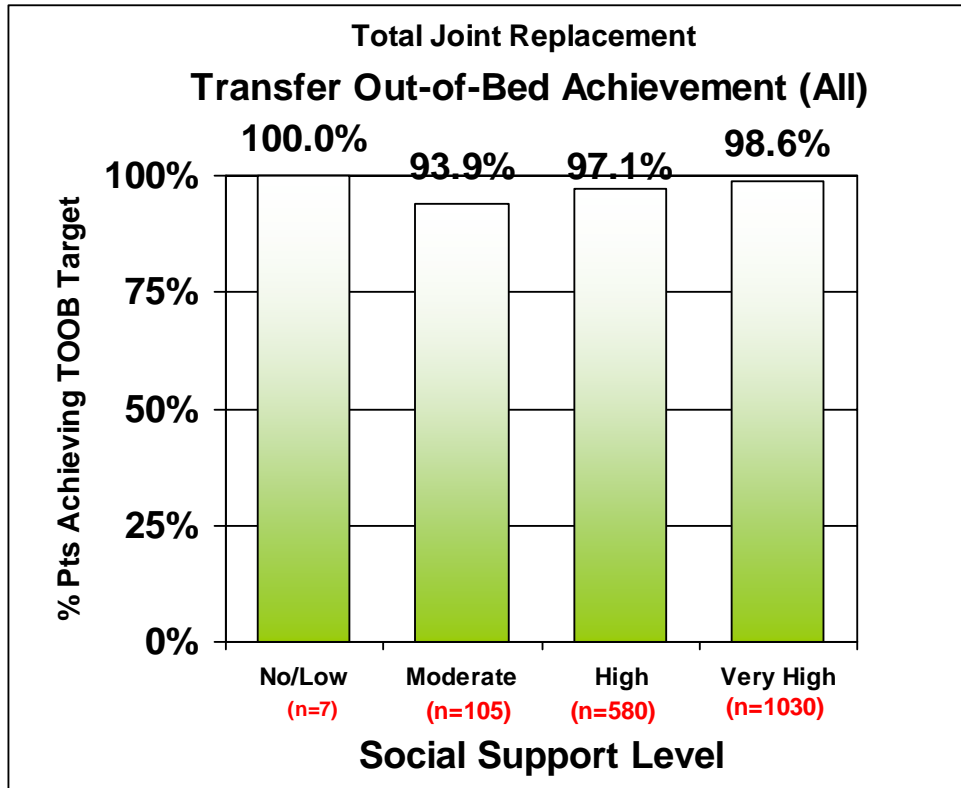
Procedure	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
Primary Hip 81.51 (n=618)	100% (n=2)	82.5%	93.7%	97.3%
Primary Knee 81.54 (n=968)	100% (n=4)	94.5%	97.2%	97.42%

Hospital	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
IAH (n=435)	75.0%	76.9%	88.4%	93.6%
IMV (n=621)	100% (n=1)	100%	98.0%	99.1%
IFH (n=280)	100% (n=2)	93.3%	98.8%	98.8%
IFO (n=401)		100%	95.6%	97.7%

Gender	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
Female (n=1010)	80.0%	88.7%	94.4%	96.9%
Male (n=712)	100% (n=2)	92.6%	96.8%	97.7%

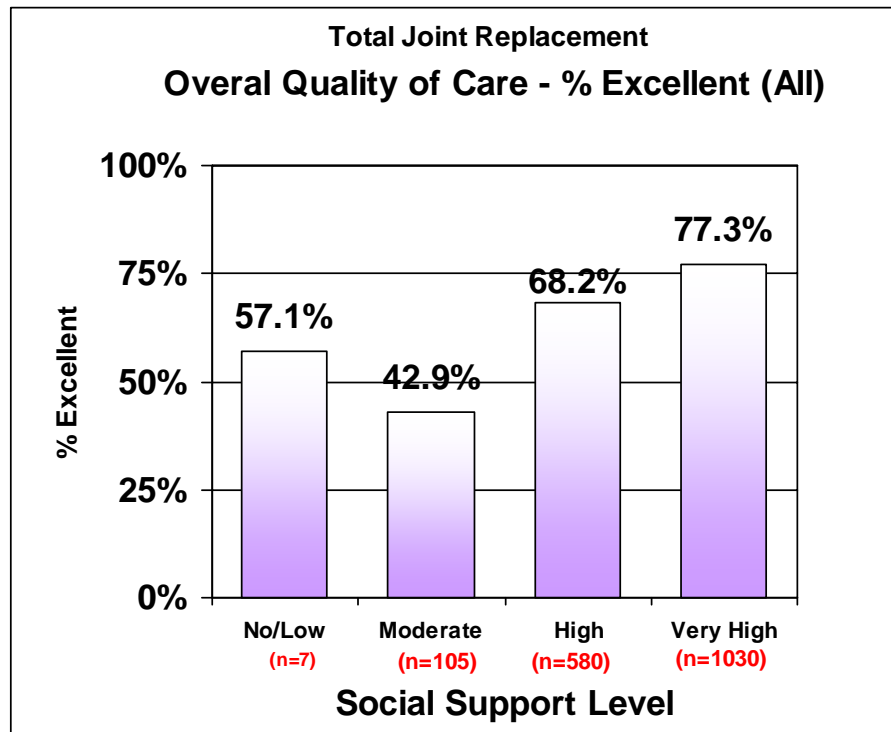


FIGURE 5



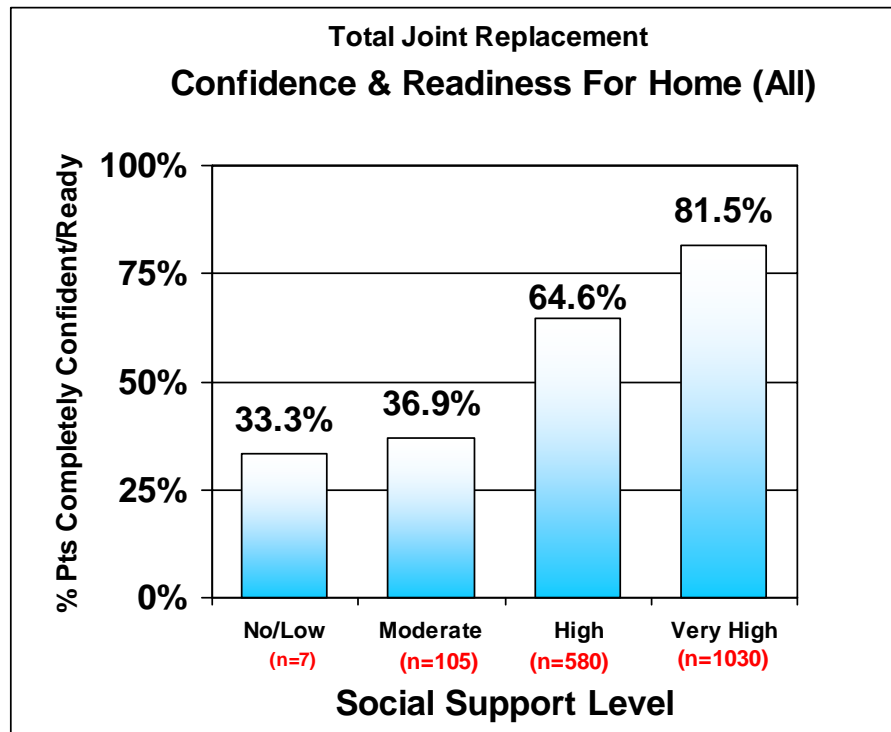
Procedure	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
<b>Primary Hip 81.51</b> (n=618)	100% (n=2)	87.5%	98.1%	99.2%
<b>Primary Knee 81.54</b> (n=968)	100% (n=4)	98.2%	96.9%	98.3%
Hospital	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
<b>IAH</b> (n=435)	100% (n=4)	84.6%	91.8%	96.3%
<b>IMV</b> (n=621)	100% (n=1)	100%	99.5%	99.4%
<b>IFH</b> (n=280)	100% (n=2)	100%	98.8%	99.4%
<b>IFO</b> (n=401)		100%	97.1%	99.5%
Gender	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
<b>Female</b> (n=1010)	100%	93.0%	96.6%	98.2%
<b>Male</b> (n=712)	100% (n=2)	96.3%	97.7%	99.1%

FIGURE 6



Procedure	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
Primary Hip 81.51 (n=618)	50% (n=2)	42.5%	67.6%	76.4%
Primary Knee 81.54 (n=968)	75% (n=4)	44.6%	68.0%	77.1%
Hospital	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
IAH (n=435)	50% (n=4)	25.0%	51.3%	64.3%
IMV (n=621)	100% (n=1)	56.0%	74.4%	83.7%
IFH (n=280)	50% (n=2)	53.3%	72.1%	76.3%
IFO (n=401)		52%	69.9%	82.7%
Gender	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
Female (n=1010)	40%	42.9%	66.1%	75.8%
Male (n=712)	100% (n=2)	42.9%	71.2%	79.2%

FIGURE 7



Procedure	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
Primary Hip 81.51 (n=618)	50% (n=2)	33.3%	66.5%	80.2%
Primary Knee 81.54 (n=968)	33% (n=4)	38.2%	62.3%	81.7%

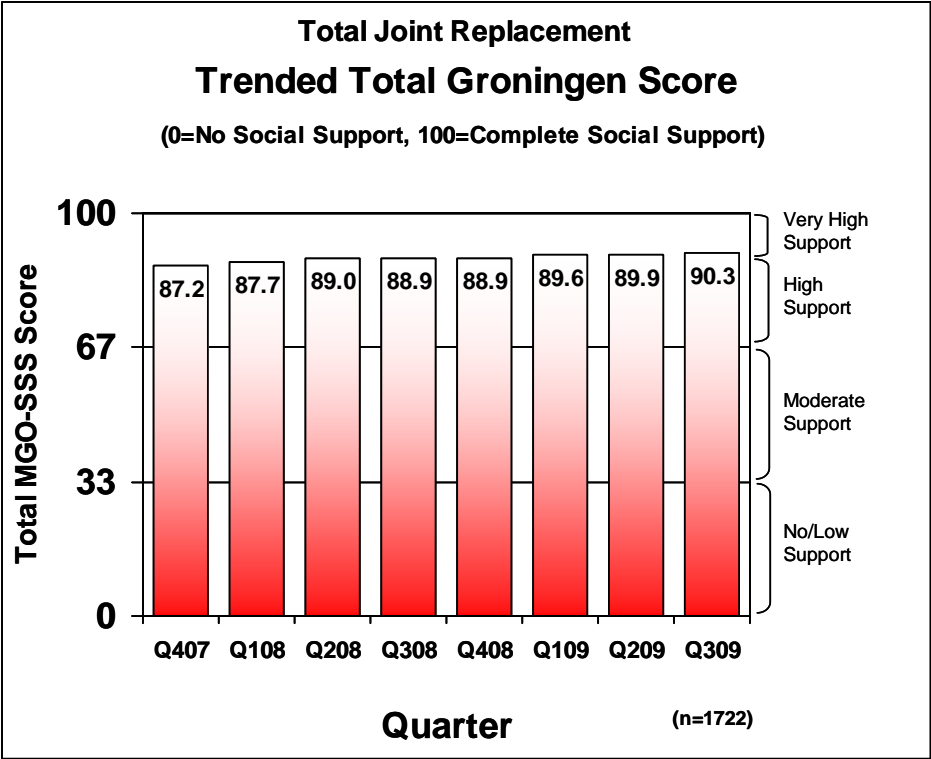
  

Hospital	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
IAH (n=435)	0% (n=4)	31.6%	52.5%	74.6%
IMV (n=621)	100% (n=1)	60.0%	75.0%	86.6%
IFH (n=280)	50% (n=2)	6.7%	63.9%	80.0%
IFO (n=401)		40%	58.9%	82.4%

Gender	Low/No Support (0-32)	Moderate Support (33-66)	High Support (67-89)	Very High Support (90-100)
Female (n=1010)	25%	34.7%	56.4%	76.9%
Male (n=712)	50% (n=2)	42.9%	76.5%	87.6%

FIGURE 8



## Figure Legends

Figure 1  
Length of Stay, Unadjusted

Figure 2  
Length of Stay, Severity-Adjusted

Figure 3  
Discharged Home

Figure 4  
Distance After Surgery

Figure 5  
Transfer Out-of-Bed After Surgery

See Figure 6  
Overall Quality of Care

Figure 7  
Confidence & Readiness for Home

Figure 8.  
Trending Improvement Over Time

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