



## **Patient Engagement Platforms Support Community Hospitals in Achieving Effective Recovery for Large Populations**

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# Introduction

Community hospitals are often faced with the challenge of spreading limited resources across a large population of patients located mainly in rural areas. Although complex procedures still need to be performed at a larger hospital, routine and commonly performed surgeries such as a total hip replacement (THA) or total knee replacement (TKA) can be performed at a local hospital. Community hospitals must then determine which recovery plan to implement. Postoperative care is traditionally administered at either a rehab facility or through the use of home health (HH). Both of these options place additional strain on community hospitals because of the increased cost and limited physicians

Since community hospitals span a large area, resources including money, time, and physicians are often spread thinly unlike larger academic hospitals. Community hospitals are often looking for solutions to combat these issues and provide enhanced care to their patients. As previously mentioned, rehab facilities and home health services place a financial burden on these hospital systems making it imperative that a new solution be put into action. Studies have shown that same day discharge (SDD) can safely and effectively be performed at community hospitals. SDD would allow for community hospitals to save money, physician time, and resources. Force Therapeutics can assist these hospitals in increasing SDD in order to reduce cost allowing resources to be reallocated. Physicians are able to dedicate more time to patients preoperatively while ensuring postoperative patients are maintaining a smooth recovery. Previous studies have shown that online platforms are a safe and reliable way to discharge THA patients. In this paper both THA and TKA patients are analyzed to determine if this is a viable option for all. The purpose of this paper is to examine how a patient engagement platform supports the caseload of a community hospital population.

# Methods

A retrospective review was conducted on 116 total hip arthroplasty (THA) and 188 total knee arthroplasty (TKA) patients at one single community hospital between August 2019 to September 2020. Three cohorts were established based on the patient reported discharge destination and utilization of Home Health services: Home with no Home Health Services, Home with Home Health Services, or Rehab facility with or without Home Health Services. The following procedures were excluded from analysis: revision procedures, and unicompartmental total knee replacement procedures. The following measures were compared between the three groups: HOOS Jr (Hip disability and Osteoarthritis Outcome Score short form), KOOS Jr (Knee injury and Osteoarthritis Outcome Score short form), VR-12 MCS and PCS, procedure satisfaction, and patient engagement through video views and login activity on the platform. Significance was defined at  $p < 0.05$ .

## Results

At baseline, similarities can be seen in age and video views (Table 1). The TKA group had slightly more females than males, while the THA group was split evenly between males and females.

Among THA patients, discharge destinations were distributed evenly between home with HH and home without HH, with fewer people being discharged to a rehab facility. However, TKA patients were mainly discharged home with HH (Table 2). For both the THA and TKA procedures the patients sent home with no HH were significantly younger than the other two cohorts with a p-value of 0.014 and 0.005 respectively (Table 2a).

TKA patients who did not receive HH, had much higher video views than the other cohorts and around the same number of logins (Table 3,4). This group performed better on both the preoperative and 12 week KOOS Jr. outcome forms. Patients at home with no HH also performed better on the VR-12 MCS/PCS outcome forms at 12 weeks compared to the other groups (Table 5). This shows that these patients felt better mentally and physically postoperatively compared to the other two groups. Patients who were discharged home with no home health were also more satisfied with their procedure at 12 weeks (Table 7). Patients discharged home without HH scored a little under the average preoperatively on the VR-12 MCS/PCS outcome form, but no significant difference was seen.

THA patients who did not receive HH, had lower video views and around average amount of logins when compared to the other two cohorts (Table 3,4). Despite this, these patients scored higher preoperatively on the VR-12 MCS form along with the HOOS Jr forms and VR-12 PCS form at 12 weeks (Table 6). These patients were also more satisfied with their procedure at 12 weeks when compared to those who went home and received HH (Table 7). Patients discharged without HH did not deviate far from the average on the following forms: HOOS Jr and VR-12 PCS preoperative, and VR-12 MCS at 12 weeks.

**Table 1. Baseline Demographics and Engagement on Platform**

|                        | Case Volume | Female        | Male          | Mean Age     | SD Age      | Avg Preop video views | Avg Postop video views | Avg Total video views |
|------------------------|-------------|---------------|---------------|--------------|-------------|-----------------------|------------------------|-----------------------|
| Total Hip Replacement  | 116         | 50.00%        | 50.00%        | 68.58        | 8.66        | 35.67                 | 59.31                  | 94.98                 |
| Total Knee Replacement | 188         | 53.19%        | 46.81%        | 68.72        | 9.08        | 38.72                 | 54.32                  | 93.04                 |
| <b>Grand Total</b>     | <b>304</b>  | <b>51.60%</b> | <b>48.40%</b> | <b>68.65</b> | <b>8.87</b> | <b>37.20</b>          | <b>56.82</b>           | <b>94.0</b>           |

**Table 2. Discharge Destination + Utilization by Procedure**

| Utilization + Destination | Home          |                |                | Rehab Facility |               |                | Grand Total |                        |
|---------------------------|---------------|----------------|----------------|----------------|---------------|----------------|-------------|------------------------|
|                           | No HH         | Home + HH      | Mean HH Visits | No HH          | Rehab + HH    | Mean HH Visits | Total       | Overall Mean HH Visits |
| Total Hip Replacement     | 52<br>(44.8%) | 54<br>(46.6%)  | 6.58           | 5<br>(4.3%)    | 5<br>(4.3%)   | 5.25           | 116         | 6.46                   |
| Total Knee Replacement    | 10<br>(5.3%)  | 153<br>(81.4%) | 8.32           | 6<br>(3.2%)    | 19<br>(10.1%) | 6.11           | 188         | 7.87                   |
| <b>Grand Total</b>        | <b>62</b>     | <b>207</b>     | <b>7.61</b>    | <b>11</b>      | <b>24</b>     | <b>5.68</b>    | <b>304</b>  | <b>7.17</b>            |

Table 2a. Discharge Destination and Demographics

| Utilization + Destination | Home         |           |              |            |                | Rehab Facility |           |              |            |                |
|---------------------------|--------------|-----------|--------------|------------|----------------|----------------|-----------|--------------|------------|----------------|
|                           | Mean Age     | No HH     | Mean Age     | Home + HH  | Mean HH Visits | Mean Age       | No HH     | Mean Age     | Rehab + HH | Mean HH Visits |
| Total Hip Replacement     | 67.13        | 52        | 69.98        | 54         | 6.58           | 77.4           | 5         | 73.80        | 5          | 5.25           |
| Total Knee Replacement    | 64.40        | 10        | 68.23        | 153        | 8.32           | 73.44          | 6         | 74.08        | 19         | 6.11           |
| <b>Grand Total</b>        | <b>65.77</b> | <b>62</b> | <b>69.11</b> | <b>207</b> | <b>7.45</b>    | <b>75.42</b>   | <b>11</b> | <b>73.99</b> | <b>24</b>  | <b>5.68</b>    |

Table 3. Video Views + Discharge Destination

|                        | Home + No HH           |                         |                        | Home + HH              |                         |                        | Rehab Facility         |                         |                        |
|------------------------|------------------------|-------------------------|------------------------|------------------------|-------------------------|------------------------|------------------------|-------------------------|------------------------|
|                        | Mean preop video views | Mean postop video views | Mean total video views | Mean preop video views | Mean postop video views | Mean total video views | Mean preop video views | Mean postop video views | Mean total video views |
| Total Hip Replacement  | 26.82                  | 56.92                   | 83.75                  | 36.61                  | 58.81                   | 95.43                  | 76.60                  | 74.40                   | 151                    |
| Total Knee Replacement | 59.20                  | 77.40                   | 136.6                  | 35.75                  | 55.03                   | 90.78                  | 48.68                  | 40.76                   | 89.44                  |
| <b>Grand Total</b>     | <b>43.01</b>           | <b>67.16</b>            | <b>110.18</b>          | <b>36.18</b>           | <b>56.92</b>            | <b>93.11</b>           | <b>62.64</b>           | <b>57.58</b>            | <b>120.22</b>          |

**Table 4. Logins + Discharge Destination**

|                        | Home + No HH      |                    |                   | Home + HH         |                    |                   | Rehab Facility    |                    |                   |
|------------------------|-------------------|--------------------|-------------------|-------------------|--------------------|-------------------|-------------------|--------------------|-------------------|
|                        | Mean preop logins | Mean postop logins | Mean total logins | Mean preop logins | Mean postop logins | Mean total logins | Mean preop logins | Mean postop logins | Mean total logins |
| Total Hip Replacement  | 8.71              | 17.58              | 26.29             | 15.41             | 19.00              | 34.41             | 22.20             | 13.10              | 35.30             |
| Total Knee Replacement | 11.3              | 15.40              | 26.70             | 11.07             | 16.56              | 27.63             | 9.88              | 11.48              | 21.36             |
| <b>Grand Total</b>     | <b>10.00</b>      | <b>16.49</b>       | <b>26.5</b>       | <b>13.24</b>      | <b>17.78</b>       | <b>31.02</b>      | <b>16.04</b>      | <b>12.29</b>       | <b>28.33</b>      |

**Table 5. Patient Reported Outcome Measure Scores in Total Knee Patients**

| Cohort         | Mean PreOp KOOS Jr. | Mean 12wk KOOS Jr. | Mean Preop VR12 PCS | Mean Preop VR12 MCS | Mean 12wk VR12 PCS | Mean 12wk VR12 MCS |
|----------------|---------------------|--------------------|---------------------|---------------------|--------------------|--------------------|
| Home + no HH   | 54.98               | 75.63              | 32.87               | 49.64               | 44.08              | 56.77              |
| Home + HH      | 53.26               | 70.11              | 33.93               | 52.79               | 41.99              | 54.10              |
| Rehab Facility | 50.58               | 73.39              | 34.11               | 52.40               | 43.43              | 52.76              |

**Table 6. Patient Reported Outcome Measure Scores in Total Hip Patients**

| Cohort         | Mean PreOp HOOS Jr. | Mean 12wk HOOS Jr. | Mean Preop VR12 PCS | Mean Preop VR12 MCS | Mean 12wk VR12 PCS | Mean 12wk VR12 MCS |
|----------------|---------------------|--------------------|---------------------|---------------------|--------------------|--------------------|
| Home + no HH   | 52.40               | 83.24              | 30.04               | 51.73               | 45.74              | 54.21              |
| Home + HH      | 53.94               | 80.68              | 30.69               | 49.17               | 44.06              | 51.52              |
| Rehab Facility | 54.03               | 78.64              | 30.86               | 49.48               | 39.46              | 55.28              |

**Table 7. 12 week Procedure Satisfaction**

|                    | Total Hip Replacement | Sample Size | Total Knee Replacement | Sample Size |
|--------------------|-----------------------|-------------|------------------------|-------------|
| Home + no HH       | 4.83                  | 52          | 4.90                   | 10          |
| Home + HH          | 4.67                  | 54          | 4.62                   | 153         |
| Rehab              | 5.00                  | 10          | 4.52                   | 25          |
| <b>Grand Total</b> | <b>4.83</b>           | <b>116</b>  | <b>4.68</b>            | <b>188</b>  |

## Discussion

Results indicate that patients who were discharged home with no HH performed better on postoperative PROMs of the outcome forms focused on. On forms in which they did not perform better, patients averaged around the same scores as both the rehab and the home with HH groups. This shows that discharging patients home with no HH required does not put them at a disadvantage. With this information community hospitals can send more patients home with no HH for a reduced cost. This will allow these hospital systems to distribute resources to other necessary areas. Patients who were discharged home with no HH were engaged on the Force Therapeutics platform which resulted in improved outcome scores. These patients were also on average more satisfied which can be attributed to high postoperative logins and engagement with their care plan throughout their recovery. Overall, patients sent home without HH performed better for the THA group when compared to the TKA group. This can be explained by the disproportionate amount of people in the three cohorts. Further research can be conducted to determine if community hospitals can send all TKA and THA patients home for recovery with the use of an online engagement platform.

## Conclusion

The results show that patients who were discharged without HH did on average better or equal to those who received HH or were sent to a rehab facility. These patients were also more satisfied with their procedure compared to those with different discharge plans. Although this group of patients did not perform better on all measures analyzed, they scored around the average of the other groups. These results have demonstrated that online platforms are beneficial to TKA and THA patients. Force Therapeutics can be used to assist community hospitals in scaling their services, managing a high volume of cases, and granting physicians more time to care for patients. Many patients succeeded when given no home health and further research should be conducted in order to determine how to further engage patients at community hospitals.

# About Force

Force Therapeutics was founded in 2010 as an episode-based digital care platform and research network designed to help clinicians intelligently extend their reach. Our platform leverages video and digital connections to directly engage patients at every step of the care journey – from the point of surgery scheduling, to post-op recovery and beyond. Backed by the insights of more than 60 leading healthcare centers across the country, Force is proven to drive more effective recovery, lower costs, and achieve better patient outcomes.

## References

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- 2 Davidovitch, Roy I, et al. "Home Health Services Are Not Required for Select Total Hip Arthroplasty Candidates: Assessment and Supplementation With an Electronic Recovery Application." *Journal of Arthroplasty*, 2018 doi:<https://doi.org/10.1016/j.arth.2018.02.048>