

Mental Illness and Target Length of Stay for Elective Joint Replacement

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ABSTRACT

Aim: To determine the rate of mental illness among cases electively admitted for hip and knee joint replacement at a large tertiary care network and to examine mental illness as a predictor of failure to meet expected length of stay targets.

Approach: A secondary data analysis of elective joint replacement cases for a primary diagnosis of arthritis in the UHN Discharge Abstract Data from April 1, 2006 to March 31, 2013. A mental illness was defined as the presence of any mental health co-morbidity other than delirium or dementia. Medical co-morbidities were determined with the Elixhauser coding algorithm. Length of stay was coded as within target or not using the current Ministry of Health targets of 4.4 and 7 days. A binary logistic regression analysis examined the relationship between mental illness and missed targets controlling for demographic, procedure and disposition variables.

Results: There were 5 986 cases of joint replacement in the selection period. 147 (2.5%) had a documented mental disorder. Failure to meet both 4.4 and 7 day targets were significantly associated with older age, earlier fiscal year, medical co-morbidities and complications. Controlling for these other variables, having a mental disorder was significantly associated with failure to meet the 7 day target only.

Conclusion: Few mental health patients undergo joint replacement at UHN. Mental illness contributes to complexity in long stay patients who may have unique needs. This is a small study which suggests possible implications for referral patterns and acute care funding.

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INTRODUCTION

- People with mental illness may not have equitable access to referral-sensitive complex interventions¹.
- Elective joint replacement for arthritis is one example of an intervention that can have significant impact on physical and mental health, and QOL.
- Inequity in access may occur because of concerns about adherence to treatment or ability to participate in rehabilitation leading to worse outcomes.
- In Ontario, the Ministry of Health has set target length of stays for hip and knee replacement: 4.4 days (primary) and 7 days.
- It is possible that this may lead to further priority selection of individuals that are expected to meet the targets.
- **AIM: To quantify the rate of mental illness among individuals receiving joint replacements at a large tertiary hospital network (UHN) and examine its impact on meeting target length of stay.**

METHODS

Study Design:

- Discharge Abstract Data (DAD) from UHN
- All individuals receiving elective hip or knee replacement for arthritis (April 1, 2006 and March 31, 2013).
- Mental illness was coded as present if there was a co-morbidity code corresponding to a mental disorder other than delirium or dementia (ICD-10 F10-99).
- Target length of stay (LOS) was based on Ministry set standards: 4.4 days and 7 days.
- Co-variate: socio-demographics, medical co-morbidities, complications of medical/surgical care, disposition.

Data Analyses:

- Hierarchical logistic regression analyses were conducted for each length of stay target: 4.4 and 7 days. Demographics, joint, fiscal year, co-morbidities and complications were entered in the models. The contribution of having a mental disorder was examined last, controlling for all other variables.

RESULTS

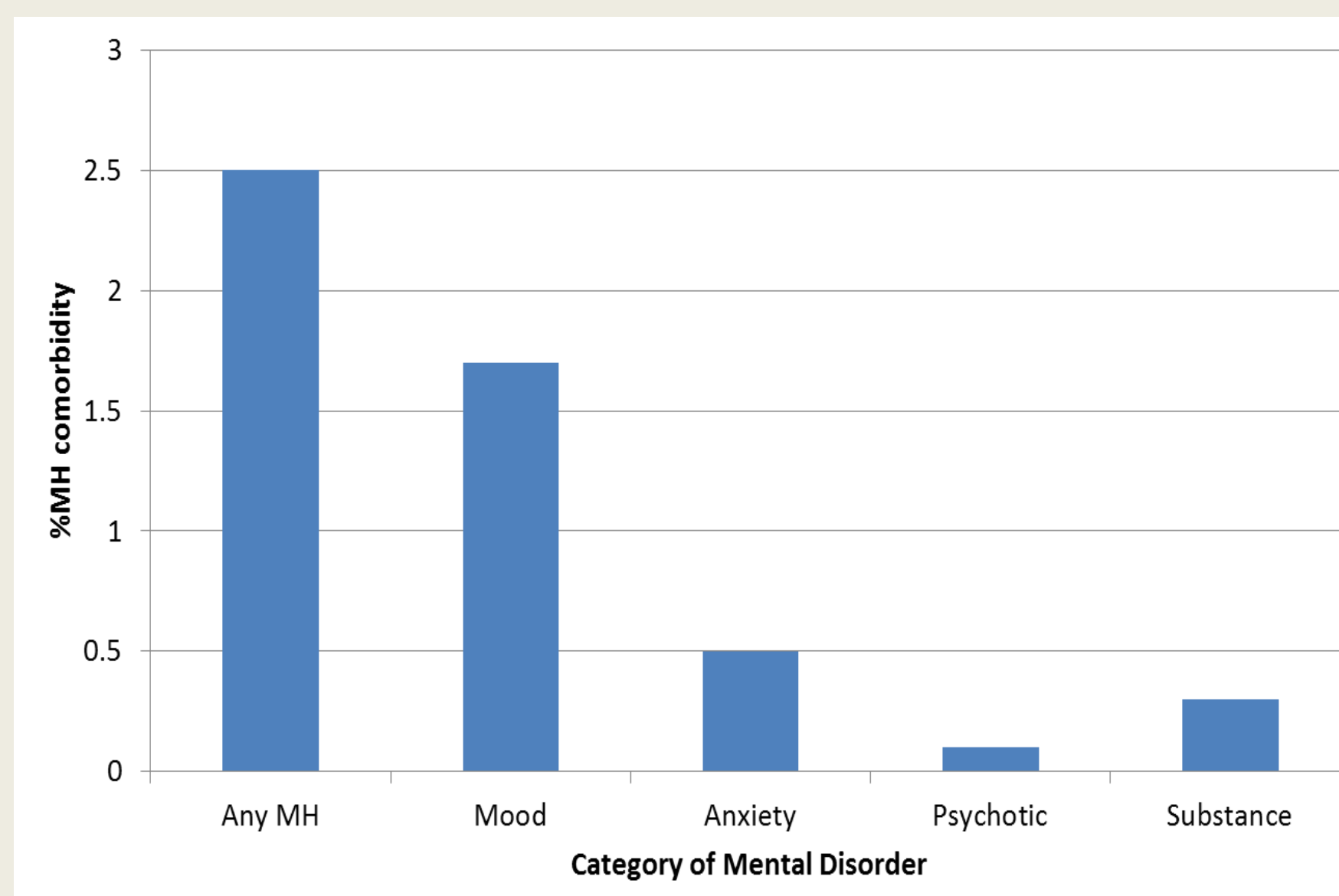


Figure 1. Mental Health Co-morbidity by Diagnostic Category

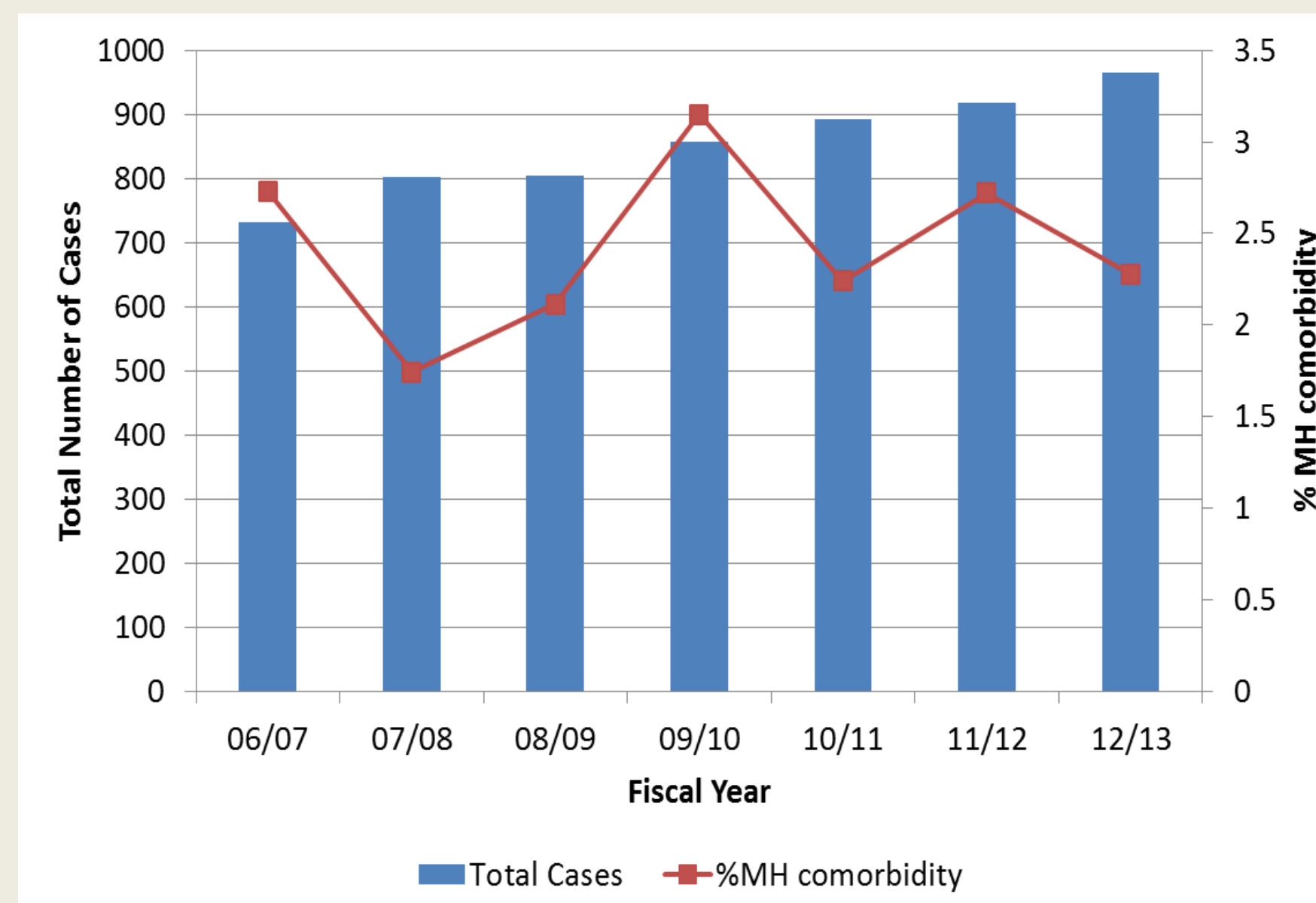


Figure 2. Proportion of Mental Health Co-morbidity by Fiscal Year

Variable	Mental Disorder (Mean/%)	No Mental Disorder (Mean/%)
Age	62.3	65.0**
Female Gender	66.0%	59.2%
Neighbourhood Income ^a	\$74.4K	\$76.8K
3+ Medical Co-morbidities	19.7%	8.0%***
Medical/Surgical Complications	15.0%	6.7%***
New Disposition ^b	32.7%	32.5%

Table 1. Socio-demographic and Disposition Variables
^aBased on Statistics Canada data for median family income derived by forward sortation area (postal code)
^bDischarged to a non-home setting other than where they originated from
p<0.01, *p<0.001

Variable	Outcome: Target 4.4 days ^a		Outcome: Target 7 days ^b	
	Wald	OR (95% CI)	Wald	OR (95% CI)
Age	38.05	1.02 (1.01, 1.02)***	6.55	1.01 (1.00, 1.03)*
Female Gender (vs. Male)	49.92	1.59 (1.40, 1.81)***	0.04	0.97 (0.76, 1.25)
Neighbourhood Income	8.04	1.00 (1.00, 1.00)**	1.42	1.00 (1.00, 1.00)
Fiscal Year	848.42	0.60 (0.58, 0.62)***	63.90	0.77 (0.72, 0.82)***
Knee Joint (vs. Hip)	29.43	1.41 (1.25, 1.60)***	0.02	0.98 (0.76, 1.26)
3+ Medical Co-morbidities	45.60	2.18 (1.74, 2.74)***	86.43	4.12 (3.06, 5.55)***
Medical/Surgical Complications	315.96	13.23 (9.95, 17.58)***	538.33	23.27 (17.84, 30.36)***
New Disposition	84.10	0.51 (0.44, 0.58)***	22.90	1.88 (1.45, 2.44)***
Mental Disorder	1.23	1.25 (0.84, 1.85)	20.95	3.31 (1.98, 5.52)***

Table 2. Regression Output.

^aVariable coded as '1' if length of stay exceeds 4.4 days. N=5 900. Cox and Snell R² = 0.23, Nagelkerke R² = 0.31.

^bVariable coded as '1' if length of stay exceeds 7 days. N=5 898. Cox and Snell R² = 0.13, Nagelkerke R² = 0.34.

*p<0.05, **p<0.01, ***p<0.001

DISCUSSION

Question 1. Where are all the people with mental illness?

Option 1. They are not being captured in administrative coding

Option 2. They are only being operated on when mental health is stable and diagnosis is not recognized

Option 3. They are not being operated on at UHN, or at all¹

Question 2. Why is mental illness associated with a higher likelihood of missing the 7 day target?

Option 1. Mental illness exacerbates during admission and complicates recovery

Option 2. Higher rate of medical co-morbidities and medical/surgical complications⁵

Option 3. More cautious care provided because of provider anxieties or biases?

Option 4. Unique needs – psychological, social

Option 5. Disposition challenges (not predicted ahead)

Limitations:

- Single institution focus limits generalizability
- Mental health co-morbidity based on hospital data not specialist consultation, standardized assessment or mental health services specific data
- Small proportion of mental health cases limits power of analysis
- LOS targets established prior to fiscal year 2012/2013, programs and services have changed

CONCLUSION

Implications:

1. Need for Services at our hospitals to increase access to elective joint procedures for people with mental illness.
 - i. Possible need for funding adjustment (volume funded procedures)
 - ii. Service delivery may need to adopt pre-, peri- and post-operative psychiatric/psychological support
 - iii. Disposition is currently a challenge for patients who need rehabilitation and have serious mental illness
2. Mental health screening may be indicated pre-operatively and/or when people extend beyond the 4.4 day target LOS