Predictors of Hysterectomy for Noncancerous Indications

Background
Hysterectomy is a common surgical procedure for U.S. women of reproductive age, with more than 600,000 performed annually. Women have hysterectomies for various indications. Noncancerous causes account for approximately 90% of hysterectomies. A number of complications are possible during or after hysterectomy. The most common complication is infection, occurring at rates of 5% to 13%, depending on surgical technique. In some noncancerous cases, there are less invasive or nonsurgical alternatives that may address the underlying condition. However, patients may not always be aware of these options. Identifying women likely to have a hysterectomy in the near future for noncancerous indications can provide an opportunity to inform patients so they can actively engage with their physicians in shared decision making. Previous published models have been based on a relatively small number of predictors. To date, the most comprehensive model for predicting hysterectomy was published more than 15 years ago, was based on an Australian population and was not specific to noncancerous indications.

Objective
To define predictors of hysterectomy for noncancerous indications in the next 3 months.

Methods
Study Design: First phase of model development
Data Source: Claims and enrollment data for individuals in a commercial health plan with Humana Inc., a health and wellness company insuring more than 16 million individuals in commercial group plans as of September 30, 2015.
Inclusion Criteria: Women age ≥ 35 years enrolled in a commercial plan at any time, November 2014 – October 2015
Intended Dependent Variable of Eventual Model: Hysterectomy for noncancerous indication within 1 month from the date of trigger identification

Selection of Triggers
1. Identification of 33 potential triggers identified by physicians with experience with Humana clinical programs, through the literature, and through analysis of claims data. In an effort to maximize hysterectomy capture rate, we selected triggers that may precede a cancer diagnosis but would not exclusively apply to women who undergo hysterectomy for cancerous reasons.
2. Consideration of all potential triggers that were present in the 6 months prior to scoring among women in the study population
3. Selection of triggers that were singularly present, i.e., present without the concurrence of other predictors, in at least some of the women

Trigger Identification for Each Observation: The presence of 0 or 1 of the selected triggers was assessed on the last day of each month during the 1-year study time frame for each woman enrolled during that month. Thus, triggers were identified for 12-1-month panels of women, yielding more than one set of data for most women.

Assessment of Trigger Set Performance: The predictive ability of the trigger set was assessed in multiple ways:
• By determining the 3-month hysterectomy rate for women with ≥ 1 of the selected triggers, compared with the rate for the overall targeted population
• By determining the 3-month hysterectomy rate for each individual trigger and for different numbers of triggers
• By calculating odds ratios (ORs) for individual triggers through logistic regression

Conclusions
• Sixteen singular triggers were identified out of the 33 potential triggers.
• Women with ≥ 1 trigger in the 6 months prior to trigger identification were several times more likely to have a hysterectomy in the next 3 months.
• 70% of all hysterectomies at 3 months were predicted by the presence of ≥ 1 trigger.

References