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Title (type in CAPITAL LETTERS)	COST-EFFECTIVENESS ANALYSIS OF UNIVERSAL CYSTOSCOPY AT THE TIME OF HYSTERECTOMY TO IDENTIFY URETERAL INJURIES INTRAOPERATIVELY.

Aims of Study: To determine the cost-effectiveness of routine cystoscopy at the time of abdominal, vaginal and laparoscopically-assisted vaginal hysterectomy in terms of cost per ureteral injury identified intraoperatively estimated to have become symptomatic.

Methods: Using a hospital perspective, a decision-analysis model was constructed to estimate the outcomes and cost of cystoscopy versus no cystoscopy at the time of hysterectomy. The incidence of ureteral injury was obtained from a review of the literature. Sensitivity analyses were performed using a range of values for key variables in order to test their effect on the model. Specifically, we examined the potential effect of changing the overall incidence of ureteral injury, the rate of silent ureteral injury, the cost of cystoscopy and the cost of therapeutic interventions on the cost-effectiveness of universal cystoscopy. We assumed a silent renal death rate of 20%.

Results: We first evaluated a model for abdominal hysterectomy. Varying the incidence of ureteral injury between 0.2% and 2% resulted in a ureteral injury threshold value of 1.5% above which routine cystoscopy was cost-saving. At a ureteral injury rate of 0.2% the marginal increase in cost of performing routine intraoperative cystoscopy was \$108 per hysterectomy performed, with an associated cost of \$54,000 per ureteral injury identified intraoperatively estimated to become symptomatic. In comparison, assuming a ureteral injury rate of 2%, routine cystoscopy resulted in a marginal cost savings of \$44 per hysterectomy performed with a cost savings of \$2200 per ureteral injury identified intraoperatively. Estimating the symptomatic ureteral injury rate at 0.5% for abdominal hysterectomy, cost-effectiveness analysis found routine cystoscopy to have a marginal increased cost of \$83 per hysterectomy. This was associated with a marginal cost-effectiveness of \$16,565 spent per ureteral injury identified intraoperatively that was destined to become symptomatic. Next, to account for the increased cost of conversion to laparotomy upon intraoperative detection of a ureteral injury, we evaluated a single model for vaginal and laparoscopically assisted vaginal hysterectomy. Varying the incidence of ureteral injury from 0.2% to 5% resulted in a ureteral injury threshold value of 2% above which cystoscopy was cost-saving. At a ureteral injury rate of 0.2% the marginal increase in cost of performing routine intraoperative cystoscopy was \$113 per hysterectomy performed, with an associated cost of \$56,500 per ureteral injury identified intraoperatively estimated to become symptomatic. In comparison, assuming a ureteral injury rate of 5%, routine cystoscopy resulted in a marginal cost savings of \$184 per hysterectomy performed with a cost savings of \$3680 per ureteral injury identified intraoperatively. The incidence of ureteral injury and the cost of readmission were the two variables with the greatest impact on cost-effectiveness.

Conclusions: The cost-effectiveness of routine intraoperative cystoscopy is significantly dependent on the rate of ureteral injury independent of the route of hysterectomy. These models provide a tool to assist physicians in deciding whether to perform cystoscopy at the time of hysterectomy.