

**Title:** Extended chemical prophylaxis for venous thromboembolism after colorectal cancer surgery is associated with improved survival: a natural experiment in the chemotherapeutic benefit of heparin derivatives

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**Introduction:**

Heparin-derivatives may confer an anti-neoplastic effect via a variety of mechanisms (e.g., inhibiting angiogenesis in the tumor microenvironment, decreasing metastatic potential via platelet disaggregation). Studies evaluating the oncologic benefit of heparin derivatives have been limited. Extended venous thromboembolism (VTE) prophylaxis (ePPx) with 30-days of low molecular weight heparin (LMWH) is recommended by society guidelines after abdominopelvic cancer surgery to reduce VTE risk. We aim to assess the association of ePPx with survival in a national cohort operated for colorectal cancer (CRC).

**Methods:**

Surveillance, Epidemiology, and End Results-Medicare data were used to identify all patients operated for non-metastatic CRC from 2015 to 2017. The primary outcome was overall (OS) and cancer-specific survival (CSS). Inverse propensity treatment weighting was used with multivariable Cox regression to compare OS and CSS in patients who received ePPx versus those that did not. Covariates included patient factors and hospital factors.

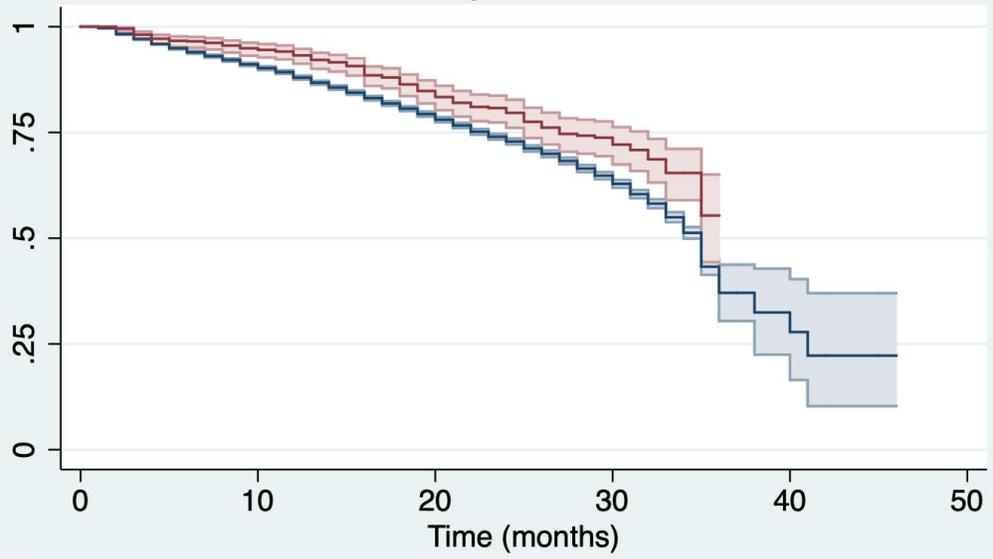
**Results:**

21,218 patients were identified; 854 (4.0%) received ePPx. Propensity weighted CSS was significantly higher in patients who received LMWH (Figure). Multivariable Cox regression showed increased OS (HR: 0.69, 95% CI: 0.60 - 0.80) and CSS (HR: 0.55, 95% CI: 0.40 – 0.76) with ePPx.

**Conclusions:**

ePPx after resection for CRC was independently associated with improved OS and CSS after controlling for patient and hospital factors. These results suggest a potential anti-neoplastic effect for LMWH when used in the context of ePPx. Further study may validate these findings in this and other solid organ cancers.

## Cancer Specific Survival



Number at risk

ePPx = 0	20242	17570	10639	3704	7	0
ePPx = 1	854	739	411	135	0	0

