

Predicting Escalations in Medical Queries Based on Web Page Structure and Content

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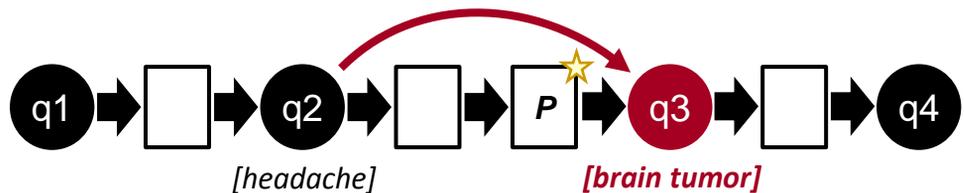
Cyberchondria

Web content can lead to escalations from concerns about typically-benign medical symptoms to searches on frightening disorders. We aim to predict such escalations based on structure and content of Web pages. Search engines could use escalation likelihood as a ranking feature or present this information to users.

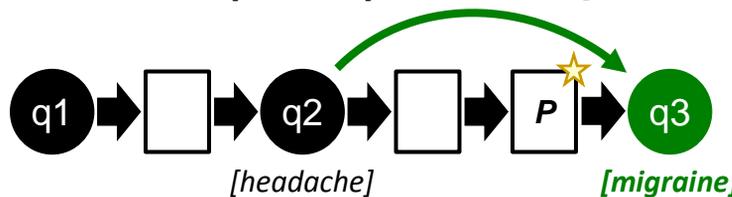
Identifying Query Escalations

- Anonymized health-related Web search sessions mined from toolbar logs
- Identified transitions from queries about symptoms to queries for related, serious/benign conditions

Next-query escalation:
Following visit to page *P*, escalation in next query



Defined non-escalation:
Follow-up query is benign as explicitly defined



Note: Other definitions of escalation and non-escalation were also tested. See paper for more details.

Predicting Query Escalations

- Built classifier to predict if query after page *P* contains escalation / non-escalation using features of *P*:
 - structural (e.g., serious illness precedes benign explanation)
 - title and URL (e.g., title has serious illness)
 - first-person testimonials (e.g., contains phrases such as “I felt” and “I am worried”)
 - reliability (e.g., page is externally verified by healthonnet.org)
 - commercial intent (e.g., contains advertisements), and
 - general (e.g., length in words, total KBs)

Probing Individual Features

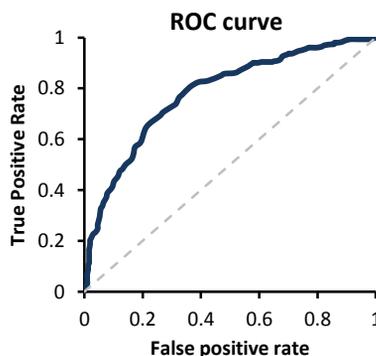
E.g., Escalation likelihood appears related to order in which serious and benign conditions appear on preceding Web page *P*

% escalations and non-escalations given order of serious and benign conditions on preceding page

Query outcome	Order of presentation	
	Serious first	Benign first
Escalation	68.6%	33.4%
Non-escalation	31.4%	66.6%

Predicting Escalations Using All Features

Best prediction accuracy: 73.4% (marginal = 50%)



- Predictive page features:
- (1) serious illness precedes benign explanation,
 - (2) serious illness or benign explanation appears in title or near start of page,
 - (3) page from forum, and
 - (4) page externally verified