



# Physician Prescribing Changes Impacted by Patient-Initiated Online Health Searches

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# Outline

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# The Impact of “Dr. Google”

Will searching the Internet about an acute medical issue change the care a person receives?





# Online Health-Related Information

- Eight in ten people have searched the Internet for health-related information [1,2].
- About 35% of people have searched about an acute medical issue before seeking emergency medical care [2,3,4,5].
  - Half searched about symptoms.
  - One third searched about specific diagnoses.
  - Others searched for treatment options, prognosis, specific hospitals, and service availability.



# Accuracy of Online Health Information

- Most people use a search engine like Google™.
  - Unstructured queries, chosen for convenience [6,7].
  - Results not authoritative.
  - Easily manipulated based on popularity, sponsorship, other factors [11,12,13].
- Lack of accuracy and agreement [2,5,8,9,10].
  - 75% of searches return inaccurate information.
  - 70% of the time, doctors disagree with Internet-based diagnoses.



# Nocebo Effect

- A person with negative expectations about a treatment results in harmful side effects or worsening symptoms.
- Statins.
  - A class of lipid-lowering medication.
  - Well-documented mortality/morbidity benefit.
  - Small but notable risk of adverse drug reaction.
    - 5% for minor reactions, <<1% for serious reactions.
  - Internet is filled with web sites that discuss statin side effects.
- Higher rate of statin intolerance [26].
  - Among people who are more likely to find a web site about statin side effects.



# Impact Of These Searches

- Online consumer health information.
  - Inaccurate.
  - Physician disagreement with diagnoses.
- Do these searches impact patient outcomes?
- Objective.
  - Do patient-initiated searches alter physician prescribing practices?
- Focus.
  - Opioid pain medication and antibiotics.



# Methods - Overview

- Observational study.
- Surveyed patients seeking acute medical care.
- University of Maryland Medical Center Emergency Department.
- Measure the impact of patient-initiated online searching on physician prescribing.



# Methods - Participants

- Participants were approached in the ED.
  - After they were triaged and before their ED care was completed.
  - Approached patients in the waiting room or at the bedside.
  - The survey was conducted by several medical students.
  - Each survey took roughly 10 minutes to complete.
- All participants went through an informed consent process.
- The study population was limited to adults between 18 and 89 years of age.



# Methods - Data Extraction

- Extracted ED encounter data from the UMMC clinical repository for each survey participant.
  - Demographics (age, gender, race, education).
  - Medical comorbidities (heart disease, diabetes mellitus, hypertension, arthritis, cancer, depression, substance misuse).
  - Patient acuity (acute complaints included syncope, chest pain, arrhythmia, dyspnea, abdominal pain, acute bleed, trauma, poisoning, and volume overload).
  - Disposition (admitted, discharged, left before completion).
  - Medications prescribed.



# Methods - Survey

1. Did you search an online resource before coming to the Emergency Department?
2. Did you use your phone or computer search?
3. What online resource(s) did you search?
4. What question(s) did you ask?



# Methods - Study Population

- Collected data between June and Dec. 2019.
  - Approached 576 subjects, 214 (37%) participated.
  - During this time, there were a total of 26,599 ED visits, with our survey participants accounting for 0.8% of all ED visits during the study period.
- Those who searched the Internet were younger, more educated, and healthier.
- The confounders were controlled for during analysis.



# Results

- 29% search the Internet.
- 94% use a search engine like Google™.
- 60% searched about their symptoms.
- Those who searched the Internet were...
  - Less likely to receive a medication (RR 0.67),
  - More likely to receive an opioid (RR 1.56).
  - Equally likely to receive an antibiotic (RR 1.01).



# Results - Demographics

	Searched	Did Not Search	P Value
Number of Subjects	62 (29%)	152 (71%)	
Male	24 (39%)	60 (39%)	0.917
Average Age (Years)	41	46	0.026
Caucasian	18 (30%)	45 (30%)	0.934
College Educated	27 (44%)	49 (32%)	0.117
Comorbidities (1 or More)	31 (73%)	88 (86%)	0.556
Acute Complaint	15 (24%)	48 (32%)	0.282
Discharged Home	33 (53%)	84 (55%)	0.788



# Results - Search Patterns

<u>Search Method</u>		<u>Search Type</u>	
Search Engine	94%	Symptoms	60%
Commercial Site	31%	Treatments	55%
Hospital/Gov't Site	13%	Resources	13%

- Many subjects use more than one search method or search type, so percentages add up to more than 100.



# Results - Medications Prescribed

	Searched	Did Not Search	Relative Risk	P Value
Received Medication	19 (31%)	70 (46%)	0.67	0.023
Received Opioid	11 of 19 (58%)	31 of 70 (44%)	1.56	0.151
Received Antibiotic	6 of 19 (32%)	32 of 70 (46%)	1.01	0.973



# Discussion

- Online consumer health information.
- Mismatched expectations.
- Opioid prescribing.
- Study limitations.



# Limitations of Online Consumer Health Information

- Notable limitations of online consumer health information.
  - Lack of accuracy.
  - Lack of physician agreement with Internet-based diagnoses.
  - Nocebo effect.
- This is especially important during the COVID-19 pandemic.
  - Online health information searches have increased.
  - Significant quality gaps have been well-documented [19,20,21,22].
- Most prior studies focused on online resources used and types of queries asked [2,3,4,18].
- Our study demonstrates how a lack of credible online health information has the potential to change clinical decision making.



# Mismatched Expectations

- Internet-inspired a-priori patient expectations.
  - Created a disconnect between patient and physician [2,3,8,9,10].
  - Altered normal clinical decision guidelines.
  - And we theorize these mismatched expectations led to a decrease in the number of medications prescribed.



# Opioid Prescribing

- There was a paradoxical increase in opioid medications.
- Opioid prescribing is a complex issue [14,25,23,24,25].
  - Patient expectations.
  - Contraindications of non-opioid alternatives.
  - Patient demographics and comorbidities.
  - Practice guidelines.
  - Physician workload.
  - Physician training.
- These mismatched patient-physician expectations may have ...
  - Resulted in an unintended relaxing of opioid prescribing guidelines.
  - Led to a change in opioid prescribing for these patients.



# Limitations

- Sample size was limited to the 214 subjects.
- Participants were limited to a single academic Emergency Department.
- This is was an observational study, that may not be interpreted as causal.



# Summary

- Observational study to measure the impact of patient-initiated online consumer health searches on physician prescribing during emergency medical encounters.
- Subjects who searched the Internet tended to be younger, healthier, and more educated.
- Accounting for these differences, we found the following about those who searched the Internet before presenting to the ED.
  - Less likely to receive a medication.
  - More likely to receive an opioid medication.
  - Equally likely to receive an antibiotic.
- We theorize that mismatched patient-physician expectations led to unintended changes in established prescribing guidelines.
- Our study demonstrates how the lack of credible online health information has the potential to alter clinical decision making.



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# Thank You

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