webPOISONCONTROL ®

How Well do Online Triage Systems Agree with a Poison Control Call Center? An Assessment of Low-Risk Exposures

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Introduction

Access to Care. This method of accessing expert advice for poison exposures has remained largely unchanged since the first poison call center (PCC) opened in 1953.

The Digital Frontier. webPOISONCONTROL and PoisonHelp are two online triage tools that provide guidance to the public.

Unknown Performance. To be clinically useful, online triage tools should direct patients to the appropriate level of care. How webPOISONCONTROL and PoisonHelp perform relative to PCC has not been studied.

Architectures of webPOISONCONTROL and PoisonHelp

	webPOISONCONTROL	PoisonHelp
Access		
Web browser	✓	✓
Smartphone app	✓	✗
User interface		
Identify substance by typing name	✓	✓
Identify product by image or barcode	✓	✗
Identify pill by imprint	✓	✗
Ingredient and strength data presented	✓	✗
Running summary of case	✓	✗
Option to chat with poison specialist	✗	✓
Routes of exposure considered		
Ingestion, skin, or bite/sting	✓	✓
Eye, inhalation, injection	✓	✗
Multiple routes	✓	✗
Information gathered for triage		
Presence of symptoms	✓	✓
Specific symptoms	✓	✗
Differentiates expected, minor, and serious symptoms	✓	✗
Amount	✓	✗
Age	✓	✓
Weight	✓	✗
Triage recommendation		
Home or call PCC	✓	✓
ED	✓	✗
Aftercare		
Home treatment instructions	✓	✓
Emails case summary and instructions to user	✓	✗
Guidance for specific symptoms	✓	✗
Follow-up		
Automated follow-up	✓	✗
Triage recommendation adjusts to new symptoms	✓	✗

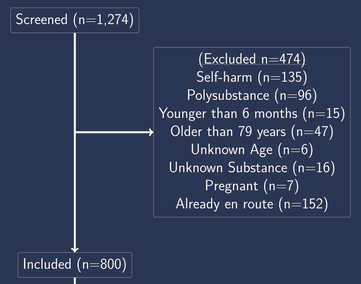
Study Goal

Determine the variation in triage recommendations across PCC, PoisonHelp and webPOISONCONTROL for uncomplicated exposures.

Abbreviations

Home Refers to care on site. Usually home.
ER Refers to urgent evaluation in a healthcare facility, usually an emergency department.
PCC Refers to a poison call center.

Methods



Analysis
Inter-rater agreement with PCC recs and between tools. Cohen's κ, to determine agreement between two raters accounting for chance and PABAK, prevalence-adjusted and bias-adjusted κ, to account for unequal prevalence of outcomes.

Triage Recommendations of Poison Control Center, webPOISONCONTROL , and PoisonHelp

	PCC	webPOISONCONTROL	PoisonHelp
Home	740 (93)	499 (62)	138 (17)
ER	60 (7)	14 (2)	0 (0)
PCC	0 (0)	287 (36)	662 (83)
Total	800 (100)	800 (100)	800 (100)

Table 1. **Recommendations of Triage Tools** Each cell denotes case count (percentage).

Agreement Between Triage Tools and Poison Control Center

		Recommendation of webPOISONCONTROL			Recommendation of PoisonHelp	
		Home	ER	PCC	Home	PCC
PCC triage to	Home	496	9	235	137	603
	ER	3	5	52	1	59

Table 2. Numbers denote case count.

Clinical Significance of Variations in Recommendations

Nine that webPOISONCONTROL sent to ER but PCC did not
- Five double doses
- Two adult opioid ingestions without access to naloxone
- One ocular caustic exposure
- One trace ingestion of a substance with no known safe threshold, although generally considered safe.

Three that PCC sent to ER but webPOISONCONTROL did not.
- Two overtriages by PCC
- One nonurgent psychiatric evaluation

One that PoisonHelp triaged to home but PCC sent to ER
- Foreign body ingestion in a toddler who was discharged home after it was localized in the lower abdomen on x-ray.

Description of Data Set

Age (years)	Under 6	351 (44%)
	6 – 12	69 (9%)
	13 – 19	34 (4%)
	20 – 69	285 (36%)
	Over 70	38 5%)
	Unknown	23 (3%)
Biological Sex	Female	423 (53%)
	Male	369 (46%)
	Not reported	8 (1.0%)
Major Substance Category	Cleaners	61 (7.6%)
	Foreign bodies, toys	60 (7.5%)
	Cosmetics, personal care products	59 (7.4%)
	Analgesics	58 (7.3%)
	Pesticides	36 (4.5%)
	Plants	33 (4.1%)
	Fumes, gases, vapors	32 (4.0%)
	Hormones and hormone antagonists	29 (3.6%)
	Dietary supplements, herbals, homeopathic	28 (3.5%)
	Topical preparations	28 (3.5%)
One Route	Ingestion	592 (74%)
	Inhalation	77 (10%)
	Eye	31 (4%)
	Skin	21 (3%)
	Injection	13 (2%)
	Bite/sting	7 (1%)
Multiple Routes	Ingestion, skin	30 (4%)
	Skin, inhalation	16 (2%)
	Ingestion, inhalation	6 (1%)
	Eye, skin	2 (0.3%)
	Other	2 (0.3%)
	Ingestion, eye, skin	1 (0.1%)
	Ingestion, eye, skin, inhalation, other	1 (0.1%)
	Skin, other	1 (0.1%)

Table 3. Numbers formatted as count (percentages).

Agreement Between webPOISONCONTROL and PoisonHelp

		PoisonHelp Recommendation Home	PCC	Total
webPOISONCONTROL Recommendation	Home	118 (85.5)	381(57.6)	499
	ER	0 (0.0%)	14 (2.1)	14
	PCC	20 (14.5)	267 (40.3)	287
	Total	138	662	800

Table 4. Each cell shows count of cases followed and percentage of column total in parentheses

Inter-rater Reliability, Quantified

	Cohen's κ	PABAK
webPOISONCONTROL vs PCC	0.22 (0.17 to 0.26)	0.38 (0.32 to 0.45)
PoisonHelp vs PCC	0.03 (0.01 to 0.05)	-0.51(-0.57 to -0.48)
webPOISONCONTROL vs PoisonHelp	0.14 (0.09 to 0.18)	0 (-0.07 to 0.07)

Table 5. Numbers formatted as inter-rater agreement (interquartile range).

Conclusions

Variation in Triage Recommendations. PCC triaged 93% of study cases to home, webPOISONCONTROL 62%, and PoisonHelp 17%.

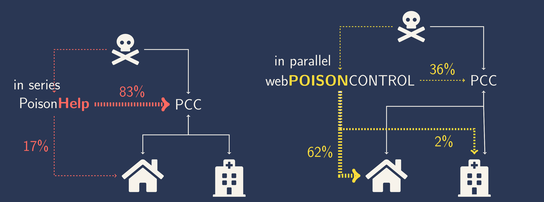
	Agreement
webPOISONCONTROL vs PCC	Fair
PoisonHelp vs PCC	Minimal
webPOISONCONTROL vs PoisonHelp	Minimal

Representative Data. 39% under 6 yrs in NPDS, 44% in our data

Discrepancy between Cohen's κ and PABAK suggests agreement between PoisonHelp and PCC reflects significant PoisonHelp bias towards referring to PCC.

Caveats. Data from one site, data entry by toxicologists not the public

Digital Entry to the Toxicological Continuum of Care



Takeaway

PoisonHelp is more suited to route low acuity volume to PCC and webPOISONCONTROL to manage that volume.

Try The Apps

For webPOISONCONTROL go to poison.org.

For PoisonHelp go to poisonhelp.org.

App: triage.webpoisoncontrol.org

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