CO-aVoID: Coronavirus Outbreak Affecting Variability of Presentations to a Local Emergency Department

Supplemental Material

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Appendix 1

Methods

The first step in this study was determining the list of presentations to analyze, as well as defining which presentations were included in each of the following categories: emergency, standard and low-acuity. A general list of presenting complaints was provided from the ED five-year admission data (2015-2019), which were defined based on standardized presenting complaints using the Canadian Emergency Department Information System (CEDIS). Included in this data were the total patient presentations and percentage of those presentations that were admitted.

This general list of presenting complaints served as a screen for the first phase of the modified Delphi process, which determined what presentations were included or excluded for analysis in the three acuity categories. To start with, the list was categorized based on total presenting numbers, which included four categories: >10,000; 5,000-9,999; 2,000-4,999, and 1,000-1,999. This, combined with the clinical judgment of a screening ED physician generated the initial presentation lists. (See Appendix Table 1 for initial presentations lists).

The second phase of the modified Delphi process involved a series of three surveys that were sent out to a group of thirteen Dalhousie Department of Emergency Medicine physicians from two regional sites; Saint John Regional Hospital and QEII Halifax Infirmary. (See Appendix 2 for surveys). In the first round, physicians ranked their agreement, “yes” or “no” for each presenting complaint status (i.e. emergency, low-acuity, or standard). They were also given space at the end of the survey to provide feedback in their own words if they wished to do so. The presenting complaints that had not yet reached consensus were returned to the group for a second round. After the second round, the data was used to generate a revised list reflecting the expert feedback. This list was returned to the group for a third round, where physicians indicated whether they agreed or not with the revised list. Once consensus was reached for all presenting complaints, the process stopped. (See Appendix Table 2 for finalized lists of presenting complaints).

Once the final list of presenting complaints was established, the ED census data collection for the study took place. New Brunswick data was securely collected, collated, and stored in a secure database located at the ED administrative office. The data for presenting complaints in the three categories of acuity was collected from February 1 to April 30, 2020, and for the same time period in the preceding year (2019). Measurable variables included the dates of ED visits, registrations to the ED, admissions to hospital, sex and age. The data for all ED presentations was collected in the same time periods, as well as 2018, 2017 and 2016. Measurable variables included date of ED visit, registrations to the ED, admissions to hospital and LWBS numbers. Data was compiled into an electronic dataset, and then analyzed using comparative statistical methods including a difference-in-difference analysis (see Table 3 for dataset). Descriptive statistics was used to summarize ED utilization at the SJRH based on presenting complaints for the time periods of the study.

Appendix Table 1: Initial screen for tracking presenting complaints as part of the first Delphi phase

Presenting Complaint	ED presentation #	% Admitted	Initial Screen
>10,000 Registrations			
Shortness of Breath	13,570	38.9%	Emergency
Chest Pain with Cardiac Features	12,296	22.2%	Emergency
Abdominal Pain	23,302	16.8%	Standard
Lower Extremity Injury	10,649	13.1%	Standard
Back Pain	11,052	5.8%	Low-Acuity
5,000-10,000 Registrations			

General Weakness	5,751	39.1%	Standard
Nausea and/or Vomiting	8,054	18.5%	Standard
Fever	6,515	13.1%	Standard
Head Injury	5,377	5.9%	Emergency
Headache	6,345	4.1%	Emergency
Laceration/Puncture	6,709	0.95%	Low-Acuity
2000-4,999 Registrations			
Weakness/?CVA	2,997	45.2%	Emergency
Major Trauma - Blunt	2,312	21.8%	Emergency
Depression - Suicidal	3,030	20.4%	Emergency
Syncope/Presyncope	3,764	17.3%	Emergency
Post OP Complications	2,235	15.3%	Standard
Anxiety/Sit. Crisis	2,793	14.1%	Standard
Diarrhea	2,084	11.3%	Standard
Palpitations/ Irregular HR	3,294	10.9%	Standard
Flank Pain	4,067	9.96%	Standard
Allergic Reaction	2,254	3.7%	Emergency
UTI	4,670	3.5%	Low-Acuity
Upper Extremity Pain	4,869	2.5%	Low-Acuity

Pregnancy issue <20wk	2,981	2.6%	Emergency
Neck Swelling/Pain	2,757	2.4%	Emergency
Rash	4,524	1.6%	Low-Acuity
Lumps, Bumps & Calluses	2,154	1.5%	Low-Acuity
Sore Throat	4,777	1.3%	Low-Acuity
Eye Pain	2,606	0.35%	Emergency
Earache	3,294	0.21%	Low-Acuity
1,000-1,999 Registrations			
Altered LOC	1,544	57.2%	Emergency
OD/Ingestion	1,373	28.6%	Emergency
Seizures	1,842	22.04%	Emergency
Blood in Stool/Melena	1,929	20.1%	Emergency
Urinary Retention	1,211	10.3%	Emergency
Constipation	1,221	6.3%	Low-Acuity
Vaginal Bleed	1,309	6.04%	Low-Acuity
Hypertension	1,326	4.3%	Low-Acuity
Facial Pain	1,072	3.3%	Low-Acuity
Epistaxis	1,031	3.1%	Low-Acuity
Dental Problem	1,836	0.82%	Low-Acuity

Bite	1,241	0.08%	Low-Acuity

Appendix Table 2: Finalized lists of presenting complaints after Delphi process

Emergency	Standard	Low-Acuity
1. Allergic Reaction 2. Altered Level of Consciousness 3. Cardiac Arrest 4. Chest Pain with Cardiac Features 5. Depression or Suicidal 6. Eye Pain 7. Head Injury 8. Major Trauma - Blunt 9. Major Trauma - Penetrating 10. Overdose or Ingestion 11. Palpitations or Irregular Heart Rate 12. Shortness of Breath 13. Seizures 14. Syncope or Presyncope 15. Urinary Retention 16. Weakness or Cerebral Vascular Accident	1. Abdominal Pain 2. Anxiety or Situational Crisis 3. Back Pain 4. Blood in Stool (Melena) 5. Epistaxis 6. Fever 7. Flank Pain 8. General Weakness 9. Headache 10. Laceration or Puncture 11. Lower Extremity Injury 12. Nausea and/or Vomiting 13. Neck Swelling or Pain 14. Post-Operative Complications 15. Pregnancy Issues <20wks 16. Vaginal Bleed	1. Bite 2. Constipation 3. Dental or Gum Problem 4. Diarrhea 5. Earache 6. Facial Pain 7. Hypertension 8. Lumps, Bumps or Calluses 9. Rash 10. Sore Throat 11. Urinary Tract Infection 12. Upper Extremity Pain

Appendix Table 3: Dataset

General demographics tracking all ED visits
Dates of ED visits Registrations to ED Admissions to hospital LWBS numbers ED LOS Boarded LOS
Visit information for preselected emergency, standard and low-acuity presentations
Dates of ED visits Registrations to ED Admissions to hospital Sex Age

Appendix Table 4: Total visits to the ED from Feb 1 to April 30 over the past five years

Totals	**2016**	**2017**	**2018**	**2019**	**2020**
ED Registrations	14,841	14,987	15,187	14,976	11,317
Admissions	1,974	1,949	2,015	2,009	1,676
LWBS	821	678	982	899	548

Appendix Table 5: Presentation patterns to the ED during the early months of the COVID-19 pandemic reporting the change in total visits for Feb 1-April 30 in 2020 compared to the same dates in 2019.

Categories	Total visits; Spring 2019	Total visits; Spring 2020	Difference in total visits	Percentage change in total visits	Categories	Total visits; Spring 2019	Total visits; Spring 2020	Difference in total visits	Percentage change in total visits
Total ED Presentations	14976	11317	-3659	-24.4%	Blood in Stool (Melena)	80	77	-3	-3.8%
					Epistaxis	58	55	-3	-5.2%
Emergency	3068	2555	-513	-16.7%	Fever	450	321	-129	-28.7%
Standard	1692	1121	-571	-33.8%	Flank Pain	204	158	-46	-22.6%
Low-Acuity	4968	3517	-1451	-29.2%	General Weakness	360	252	-108	-30.00%
Emergency Presenting Complaints					Headache	292	226	-66	-22.6%
Allergic Reaction	116	74	-42	-36.2%	Laceration or Puncture	250	209	-41	-16.4%
Altered Level of Consciousness	103	86	-17	-16.5%	Lower Extremity Injury	475	368	-107	-22.5%
Cardiac Arrest	26	23	-3	-11.5%	Nausea and/or Vomiting	429	273	-156	-36.4%
Chest Pain with Cardiac Features	570	521	-49	-8.6%	Neck Swelling or Pain	108	67	-41	-37.96%
Depression or Suicidal	202	159	-43	-21.3%	Post-Operative Complications	117	37	-80	-68.4%
Eye Pain	97	69	-28	-28.9%	Pregnancy Issues <20wks	158	117	-41	-25.95%
Head Injury	316	181	-135	-42.7%	Vaginal Bleed	59	28	-31	-52.5%
Major Trauma - Blunt	118	90	-28	-23.7%	***Low-Acuity Presenting Complaints***				
Major Trauma - Penetrating	6	6	0	0.00%	Bite	35	31	-4	-11.4%
Overdose or Ingestion	55	63	8	14.6%	Constipation	48	49	1	2.1%
Palpitations or Irregular Heart Rate	221	192	-29	-13.1%	Dental or Gum Problem	95	85	-10	-10.5%

Shortness of Breath	741	649	-92	-12.4%	Diarrhea	96	53	-43	-44.8%
Seizures	113	93	-20	-17.7%	Earache	170	111	-59	-34.7%
Syncope or Presyncope	222	180	-42	-18.9%	Facial Pain	58	23	-35	-60.3%
Urinary Retention	53	63	10	18.9%	Hypertension	80	59	-21	-26.3%
Weakness or Cerebral Vascular Accident	109	106	-3	-2.8%	Lumps, Bumps or Calluses	114	88	-26	-22.8%
Standard Presenting Complaints					Rash	252	135	-117	-46.4%
Abdominal Pain	1217	873	-344	-28.3%	Sore Throat	276	172	-104	-37.7%
Anxiety or Situational Crisis	156	125	-31	-19.9%	Urinary Tract Infection	196	139	-57	-29.1%
Back Pain	555	331	-224	-40.4%	Upper Extremity Pain	272	176	-96	-35.3%

Appendix Table 6: Presentation patterns to the ED during the early months of the COVID-19 pandemic reporting the changes in visits and admissions per week comparing pre- and post- March 13 in 2019 with the difference in 2020.

Categories	**Change in visits per week**	**Percentage change in visits per week**	**Change in admissions**
Emergency	-61.3* (-85.4, -37.2)	-24.3%	-12.04* (-22.99, -1.1)
Standard	-158.3* (-189.99, -126.7)	-40.9%	-10.9* (-21.04, -0.69)
Low-Acuity	-85.7* (-103.3, -68.1)	-79.3%	0.67 (-1.9, 3.2)
Emergency Presenting Complaints			
Depression or Suicidal	-9.7* (-16.5, -2.8)	-63.2%	
Eye Pain	-5.5* (-9.6, -1.3)	-72.9%	
Palpitations or Irregular Heart Rate	-7.6* (-13.6, -1.6)	-50.3%	
Standard Presenting Complaints			
Abdominal Pain	-36.5* (-51.6, -21.5)	-42.2%	
Anxiety or Situational Crisis	-7.1* (-12.8, -1.3)	-63.1%	

Back Pain	-10.7* (-20.8, -0.55)	-23.8%
Fever	-17.2* (-26.5, -7.8)	-39.8%
General Weakness	-17.6* (-25.5, -9.7)	-65.1%
Headache	-16.3* (-23.3, -9.4)	-77.9%
Laceration or Puncture	-8.8* (-15.7, -1.9)	-62.2%
Nausea and/or Vomiting	-16.6* (-26.2, -7.01)	-48.7%
Low-Acuity Presenting Complaints		
Constipation	-4.5* (-7.5, -1.4)	-41.9%
Earache	-12.7* (-17.9, -7.6)	-61.3%
Hypertension	-5.1* (-8.8, -1.5)	-48.7%
Rash	-15.5* (-21.8, -9.3)	-57.9%
Sore Throat	-13.2* (-20.3, -6.02)	-71.7%
Urinary Tract Infection	-13.3* (-19.3, -7.4)	-48.9%

*$p<0.05$

Appendix 2: Delphi Method Survey – Rounds 1 through 3

First Round of the Delphi Method Survey

All changes saved in Drive

Send

Questions Responses 13

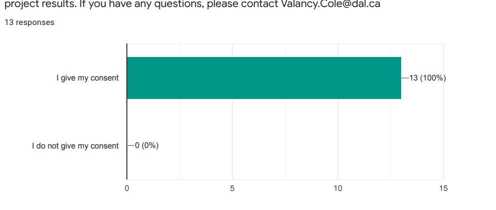
13 responses

Summary Question Individual

Accepting responses

By completing the survey, you are indicating your consent to participate in this research project. All survey responses will remain confidential and only group data will be reported. There is no financial compensation for your participation in this research. Only the research team and appropriate staff Horizon Health will have access to the data. You will not be identified in any reports or publications arising from your participation in this study. The results will be presented at conferences and be published in an academic research journal. The completed questionnaires will be stored securely for 7 years after publication of the project results. If you have any questions, please contact Valancy.Cole@dal.ca

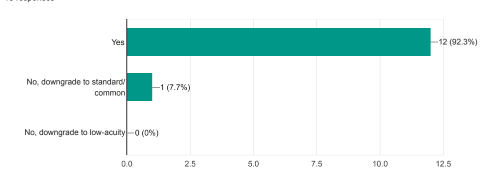
13 responses



Do you agree with each of the following emergency/urgent conditions?

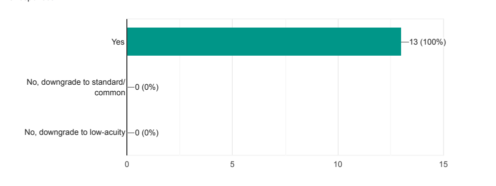
Shortness of Breath

13 responses



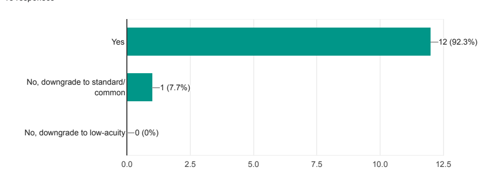
Chest Pain with Cardiac Features

13 responses



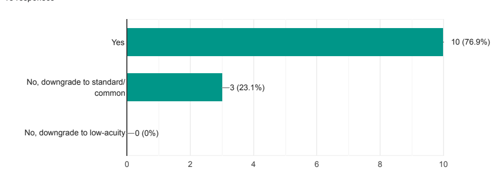
Head Injury

13 responses



Headache

13 responses



Weakness/ Query CVA

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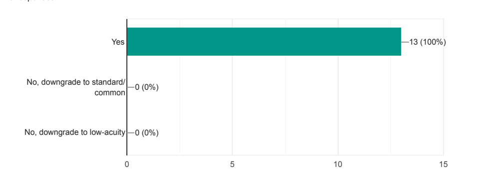

Major Trauma - Blunt

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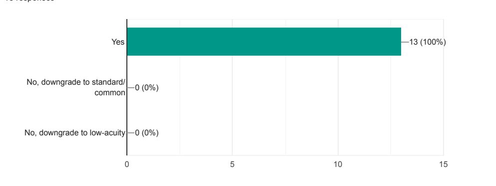
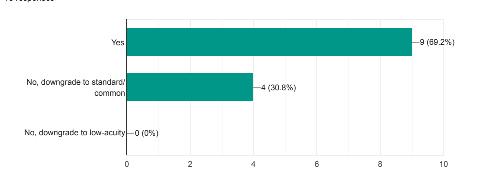


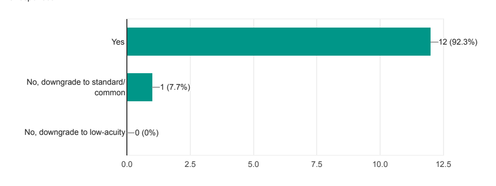
Depression/Suicidal

13 responses



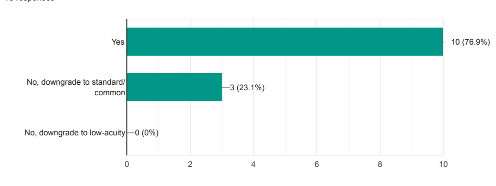
Syncope/Presyncope

13 responses



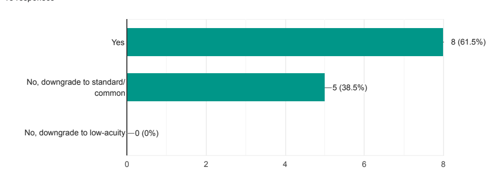
Allergic Reaction

13 responses



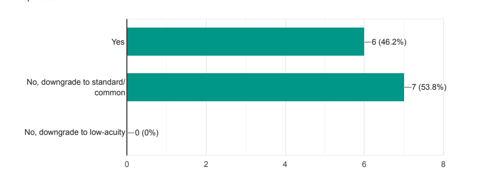
Pregnancy Issues <20wks

13 responses



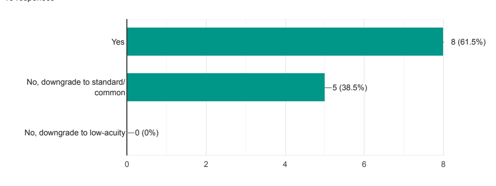
Neck Swelling/Pain

13 responses



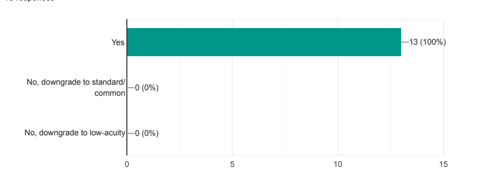
Eye Pain

13 responses



Altered LOC

13 responses



OD Ingestion

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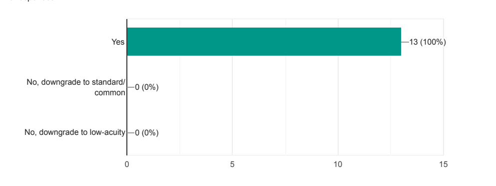
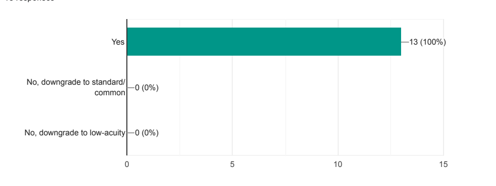


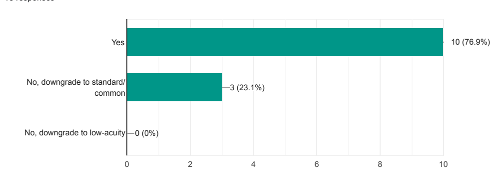
Seizures

13 responses



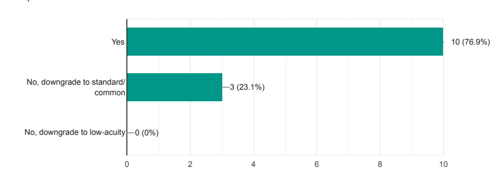
Blood in Stool/Melena

13 responses



Urinary Retention

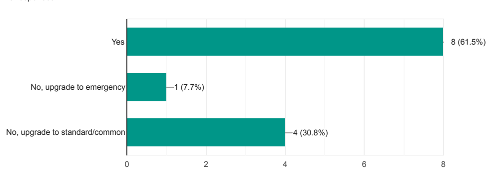
13 responses



Do you agree with each of the following low-acuity conditions?

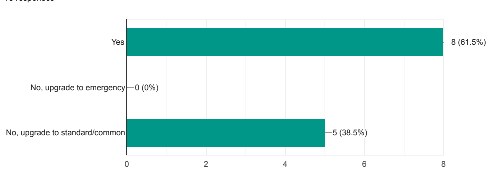
Back Pain

13 responses



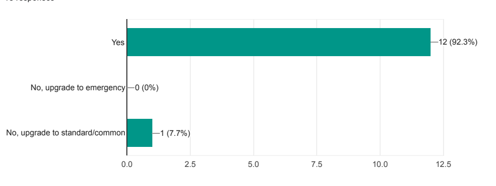
Laceration/Puncture

13 responses



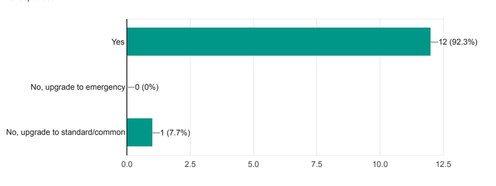
UTI Complaints/Symptoms

13 responses



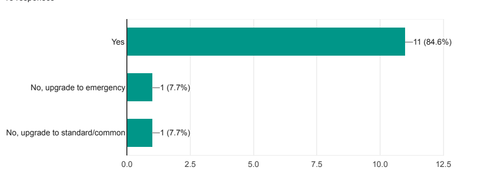
Upper Extremity Pain

13 responses



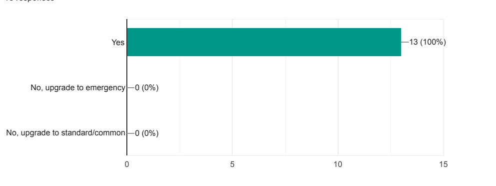
Rash

13 responses



Lumps, Bumps & Calluses

13 responses



Sore Throat

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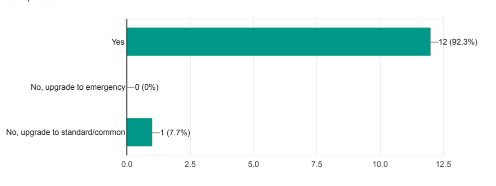
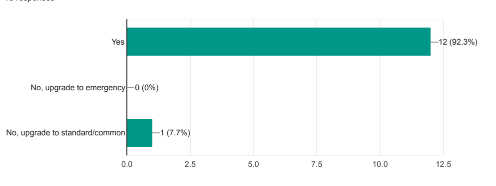


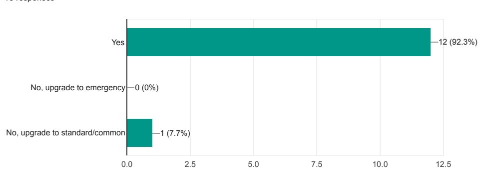
Earache

13 responses



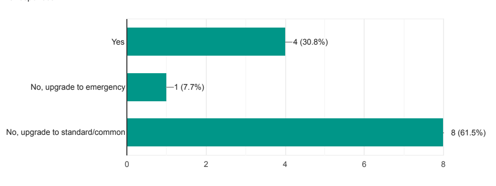
Constipation

13 responses



Vaginal Bleed

13 responses



Hypertension

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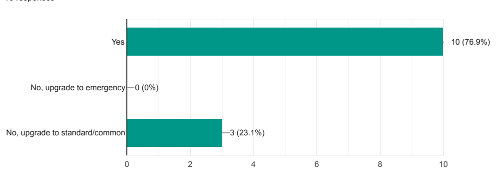

Facial Pain

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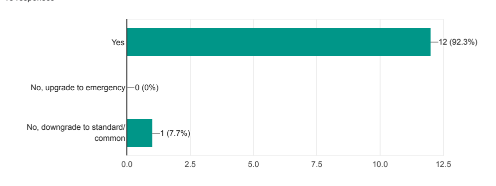
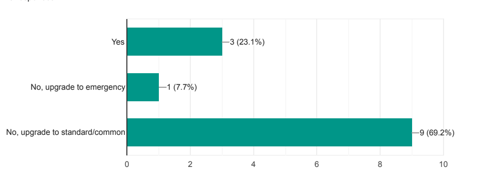


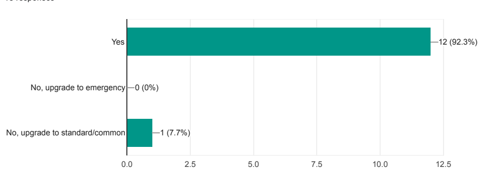
Epistaxis

13 responses



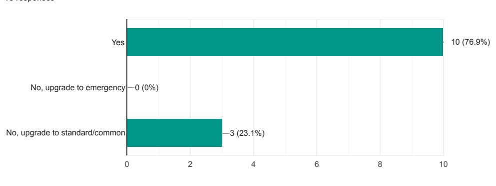
Dental/Gum Problem

13 responses



Bite

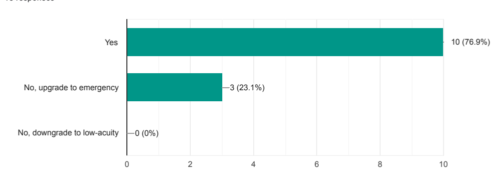
13 responses



Do you agree with each of the following standard/common conditions?

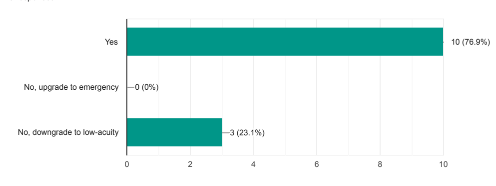
Abdominal Pain

13 responses



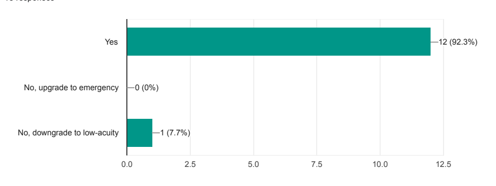
Lower Extremity Injury

13 responses



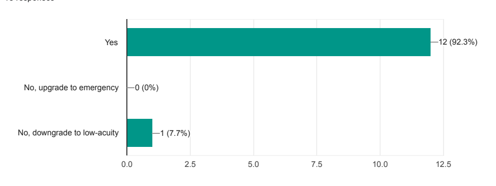
General Weakness

13 responses



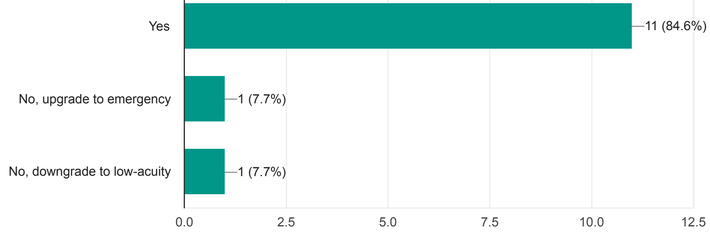
Nausea and/or Vomiting

13 responses



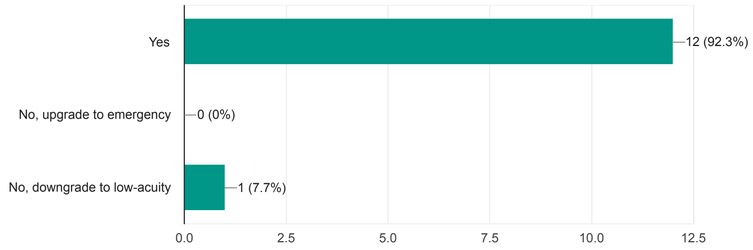
Fever

13 responses



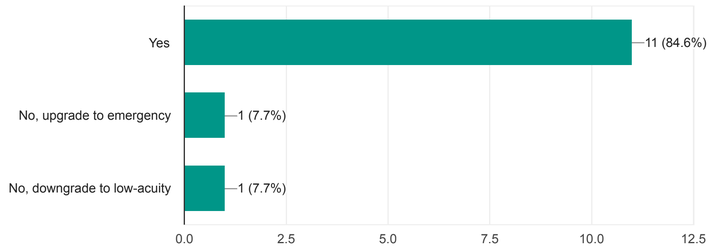
Post-Op Complications

13 responses



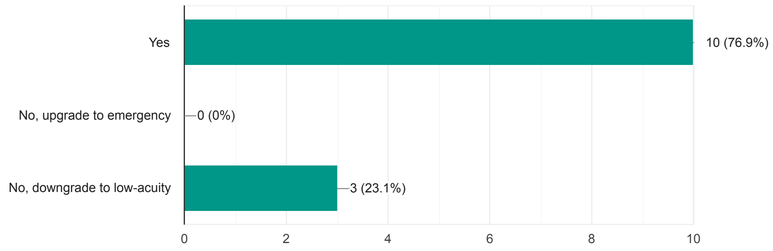
Anxiety/Situational Crisis

13 responses



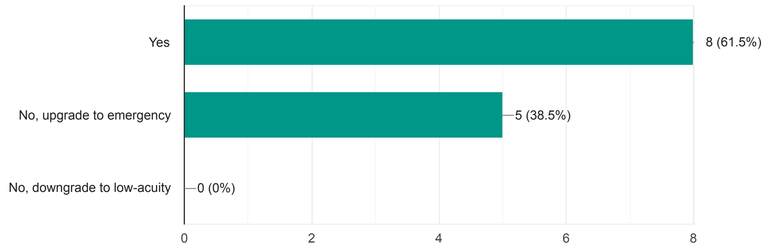
Diarrhea

13 responses



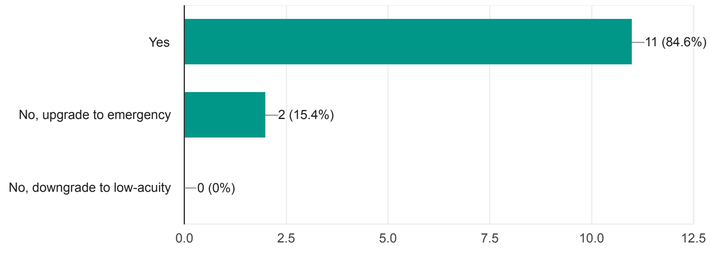
Palpitations/Irregular HR

13 responses



Flank Pain

13 responses



Would you like to add a presenting complaint we may have missed? If so, please comment below.

Presenting complaint(s) I would like to add:

1 response

toxic exposure /contamination (emergency)

Second Round of the Delphi Method Survey

All changes saved in Drive

Send

Questions | Responses 11

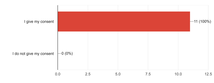
11 responses

Accepting responses

Summary | Question | Individual

By completing the survey, you are indicating your consent to participate in this research project. All survey responses will remain confidential and only group data will be reported. There is no financial compensation for your participation in this research. Only the research team and appropriate staff Horizon Health will have access to the data. You will not be identified in any reports or publications arising from your participation in this study. The results will be presented at conferences and be published in an academic research journal. The completed questionnaires will be stored securely for 7 years after publication of the project results. If you have any questions, please contact Valancy.Cole@dal.ca

11 responses



Please review the following ED presentations and select what categorization best fits each:

Headache

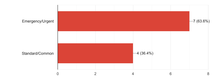
11 responses

Depression - Suicidal

11 responses

Allergic Reaction

11 responses



Pregnancy Issues <20wks

11 responses

Neck Swelling/Pain

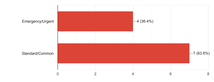
11 responses

Eye Pain

11 responses

Blood in Stool/Melena

11 responses



Urinary Retention

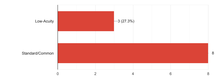
11 responses

Back Pain

11 responses

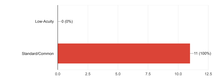
Laceration/Puncture

11 responses



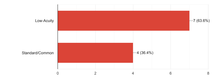
Vaginal Bleed

11 responses



Hypertension

11 responses



Epistaxis

11 responses

Bite

11 responses

Abdominal Pain

11 responses

Lower Extremity Injury

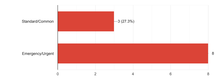
11 responses

Diarrhea

11 responses

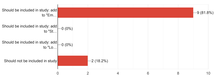
Palpitations/Irregular HR

11 responses



Toxic Exposure/ Contamination

11 responses



Would you like to add a presenting complaint we may have missed? If so, please comment below.

0 responses

No responses yet for this question.

Third Round of the Delphi Survey

All changes saved in Drive

Send

Questions Responses 9

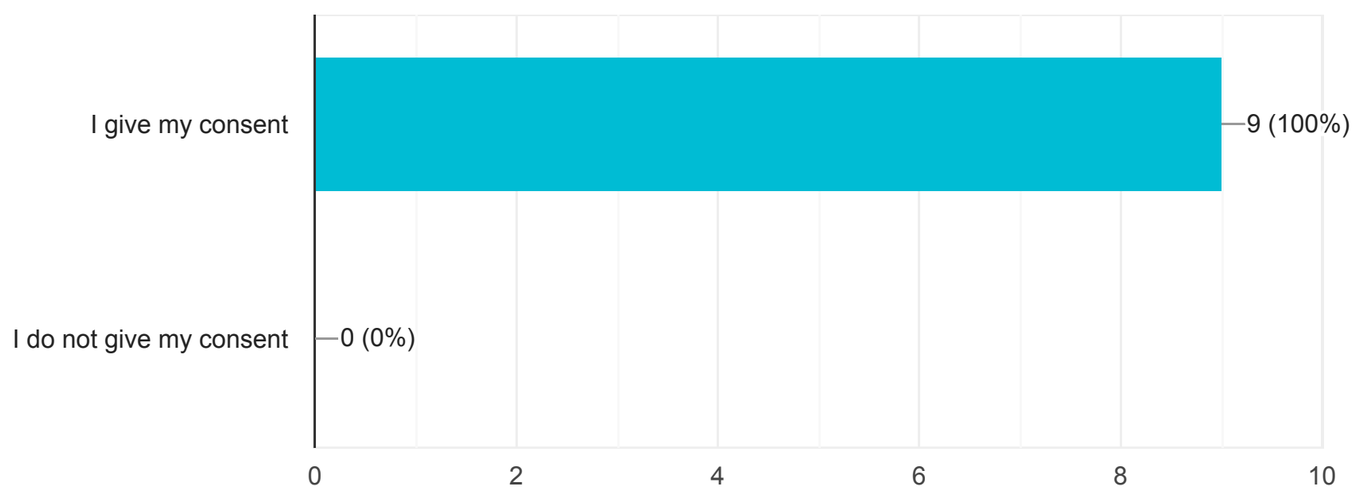
9 responses

Accepting responses

Summary Question Individual

By completing the survey, you are indicating your consent to participate in this research project. All survey responses will remain confidential and only group data will be reported. There is no financial compensation for your participation in this research. Only the research team and appropriate staff Horizon Health will have access to the data. You will not be identified in any reports or publications arising from your participation in this study. The results will be presented at conferences and be published in an academic research journal. The completed questionnaires will be stored securely for 7 years after publication of the project results. If you have any questions, please contact Valancy.Cole@dal.ca

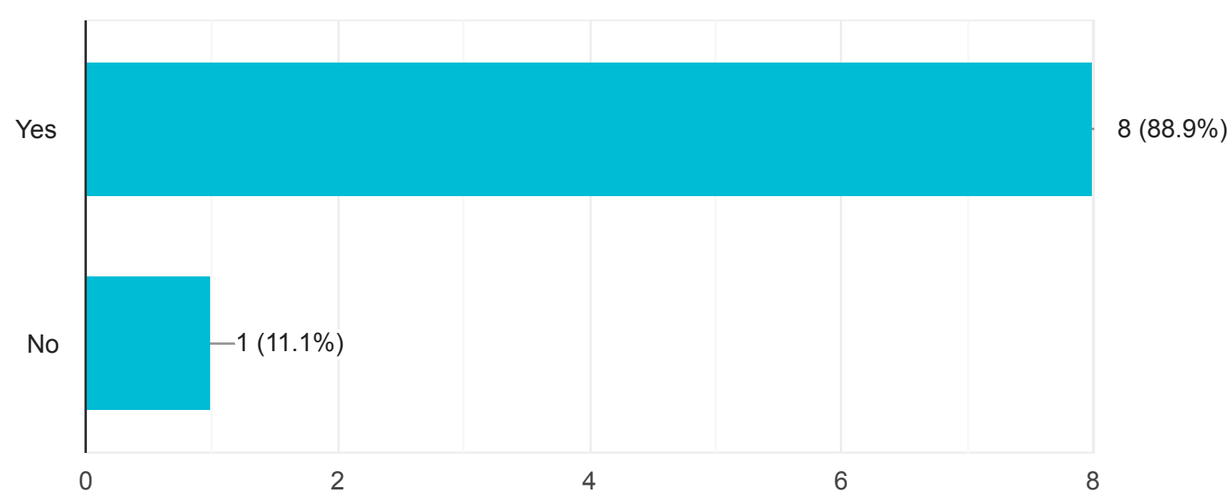
9 responses



Please review the full list of presenting complaints:

Please review the full list of presenting complaints (see below). Do you accept this list as our presenting complaints that we will track?

9 responses



If you selected "no", why?

1 response

HTN should be standard I feel

Please review the full list of presenting complaints:

1. SOB (Emergency/Urgent)
2. Chest Pain with Cardiac Features (Emergency/Urgent)
3. Cardiac Arrest (Emergency/Urgent)
4. Head Injury (Emergency/Urgent)
5. Weakness/ ?CVA (Emergency/Urgent)
6. Major Trauma - Blunt (Emergency/Urgent)
7. Major Trauma - Penetrating (Emergency/Urgent)
8. Syncope/Presyncope (Emergency/Urgent)
9. Altered LOC (Emergency/Urgent)
10. OD Ingestion (Emergency/Urgent)
11. Seizures (Emergency/Urgent)
12. Depression – Suicidal (Emergency/Urgent)
13. Allergic Reaction (Emergency/Urgent)
14. Eye Pain (Emergency/Urgent)
15. Urinary Retention (Emergency/Urgent)
16. Palpitations/Irregular HR (Emergency/Urgent)
17. General Weakness (Standard/Common)
18. Nauseas and/or Vomiting (Standard/Common)
19. Fever (Standard/Common)
20. Post-Op Complications (Standard/Common)
21. Anxiety - Situational Crisis (Standard/Common)
22. Flank Pain (Standard/Common)
23. Headache (Standard/Common)
24. Pregnancy Issues <20wks (Standard/Common)
25. Neck Swelling or Pain (Standard/Common)
26. Blood in Stool (Melena) (Standard/Common)
27. Back Pain (Standard/Common)
28. Laceration or Puncture (Standard/Common)
29. Vaginal Bleed (Standard/Common)
30. Epistaxis (Standard/Common)
31. Abdominal Pain (Standard/Common)
32. Lower Extremity Injury (Standard/Common)
33. UTI Complaints/Symptoms (Low-Acuity)
34. Upper Extremity Pain (Low-Acuity)
35. Rash (Low-Acuity)
36. Lumps, Bumps and Calluses (Low-Acuity)
37. Sore Throat (Low-Acuity)
38. Earache (Low-Acuity)
39. Constipation (Low-Acuity)
40. Facial Pain (Low-Acuity)
41. Dental or Gum Problem (Low-Acuity)
42. HTN (Low-Acuity)
43. Bite (Low-Acuity)
44. Diarrhea (Low-Acuity)