APPENDIX 1: Survey tool—final version.

*Mandatory questions

Eligibility: 1. I am currently a licensed pharmacist practising in a hospital setting in Ontario.* (Yes/No) **Background Information:** 1. How many years have you been practising as a pharmacist?* 2. What is your gender?* 3. Where did you complete pharmacy school? (e.g., Ontario, Canada [outside Ontario], USA, international)* 4. What is your highest level of pharmacy degree obtained? (BSc in Pharmacy, PharmD entry-level, PharmD post-graduate)* 5. Have you completed an accredited hospital pharmacy residency in Canada or the United States?* 6. What is the approximate bed size of your hospital (<50, 50–200, 201–500, >500)?* 7. If your hospital has multiple sites, please report the number of beds at the site where you primarily work. 8. Does your primary hospital workplace currently have a general policy or medical directive for pharmacists to adapt or modify medication orders? If so, please specify:* □ My hospital has a general adaptation/modification **policy** (please provide more details): My hospital has a general adaptation/modification medical directive (please provide more details): My hospital does not currently have a general policy or medical directive for pharmacists to modify/adapt medication orders Disclaimer: Please select the answer below that best represents how you feel about each statement. There is no right or wrong answer. Note: In this survey, "Pharmacist Prescription Modification" or "Modifying a Medication Order" refers to: Prescription adaptation, defined as changing a patient's pre-existing medication order with regard to the dose, dosage form, directions for use, or the route of administration as described in the Pharmacy Act; OR Discontinuing, holding, or renewing a patient's medication order. • For the purposes of this study, pharmacist prescription modification does not include therapeutic substitution, which involves changing a preexisting prescription to a chemically different product considered to be therapeutically equivalent. Pharmacist prescription modification excludes narcotics, controlled drugs, and targeted substances. (1) Self-Efficacy for Pharmacist Prescription Modification How sure are you that you could: Perform a patient assessment to modify any medication order?* Rather sure Not sure at all Slightly sure Somewhat sure Quite sure Very sure Extremely sure Note: A Patient Assessment is defined as: Determining that the therapy is safe and effective by considering the risks and benefits and other relevant individual circumstances of the patient, including, but not limited to the following: a) the patient's medical history, including co-morbid disease states and chronic conditions; b) laboratory or other tests, as available; c) symptoms reported by the patient;

- d) the patient's allergies and other contraindications and precautions;
- e) other medications the patient may be taking;
- f) the patient's gender, age, weight and height (where applicable);
- g) pregnancy and lactation status, if applicable;
- h) any other inquiries reasonably necessary in the circumstances.

	Not sure at all	Slightly sure	Somewhat sure	Rather sure	Quite sure	Very sure	Extremely sure
	Modify any medicat	ion order in a clinica	al area that you are no	ot familiar with?*			
	Not sure at all	Slightly sure	Somewhat sure	Rather sure	Quite sure	Very sure	Extremely sure
4. Modify any medication order for patients starting a new therapy in hospital?*							
	Not sure at all	Slightly sure	Somewhat sure	Rather sure	Quite sure	Very sure	Extremely sure
5. Modify any medication order for patients continuing a pre-existing therapy from home?*							
	Not sure at all	Slightly sure	Somewhat sure	Rather sure	Quite sure	Very sure	Extremely sure
6 Perform appropriate documentation for the rationale of modifying a medication order?*							
	Not sure at all	Slightly sure	Somewhat sure	Rather sure	Quite sure	Very sure	Extremely sure
	Accept responsibility for medication management?*						
	Not sure at all	Slightly sure	Somewhat sure	Rather sure	Quite sure	Very sure	Extremely sure

(2) Support from Practice Environment for Pharmacist Prescription Modification

To what extent would the following factors in your current practice location affect your ability to modify any medication order?

1. Amount of pharmacy staffing?*

Support implies that the amount of staffing facilitates your ability to modify any medication order.

Barrier implies that the amount of staffing hinders your ability to modify any medication order.

Strong barrier Weak barrier	Not a factor	Weak support	Strong support
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2. Current patient load and/or other workload?*

(e.g., project work, scheduling)

Support implies that your current workload facilitates your ability to modify any medication order.

Barrier implies that your current workload hinders your ability to modify any medication order.

Strong barrier Weak barrier Not a factor Weak support Strong support
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3. Technology?*

(e.g., access to electronic medical records, computerized physician order entry, cross-hospital databases such as ConnectingON)

Support implies that the technology at your practice location facilitates your ability to modify any medication order.

Barrier implies that the technology (or lack thereof) at your practice location hinders your ability to modify any medication order.

Strong barrier	Weak barrier	Not a factor	Weak support	Strong support

4. Physical practice environment?*

(e.g., availability of pharmacist workstations)

Support implies that your physical practice environment facilitates your ability to modify any medication order. Barrier implies that your physical practice environment hinders your ability to modify any medication order.

Strong barrier	Weak barrier	Not a factor	Weak support	Strong support
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5. Employer's expectations?*

Support implies that your employer actively supports and/or would advocate for pharmacist prescription modification. **Barrier** implies that your employer does not actively support or is unlikely to take steps toward pursuing pharmacist prescription modification in the near future.

Strong barrier Weak barrie	Not a factor	Weak support	Strong support
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(3) Support from Interprofessional Relationships for Pharmacist Prescription Modification

To what extent would the following factors affect your ability to modify any medication order?

1. Relationship with prescribers?*

Support implies that your relationships with prescribers facilitates your ability to modify any medication order. Barrier implies that your relationships with prescribers (or lack thereof) hinders your ability to modify any medication order.

	Strong barrier	Weak barrier	Not a factor	Weak support	Strong support
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2. Relationship with nursing and allied health professionals?*

Support implies that your relationships with nursing and allied health facilitates your ability to modify any medication order. Barrier implies that your relationships with nursing and allied health (or lack thereof) hinders your ability to modify any medication order.

	Strong barrier	Weak barrier	Not a factor	Weak support	Strong support
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Disclaimer:

Please answer in your own words, as briefly as possible. There is no right or wrong answer.

Open-Ended Questions (optional):

- 1. Name up to three benefits that pharmacist prescription modification of any medication order could provide (or already provides) to your current practice:
- 2. Name up to three benefits that pharmacist prescription modification of any medication order could provide to patients:
- 3. Name up to three problems that could arise (or that you have seen arise) if pharmacists are able to modify any medication order without authorized prescriber approval and/or signature:
- 4. Do you have concerns about liability from clinical errors due to pharmacist prescription modification? If so, please list up to three consequences of clinical errors you are concerned about:
- 5. Would additional training would be beneficial to support your ability to modify any medication order? If so, please list up to three areas where you would like further training:
- 6. Do you feel there are personal limitations in your ability to appropriately modify any medication order? If so, list up to three personal limitations:
- 7. Is there any technology that would improve your ability to appropriately perform pharmacist prescription modification (including ability to assess the patient, decision-making, and documentation), but is currently lacking at your hospital? If so, please list:
- 8. What are some department-wide changes that could occur to better prepare your pharmacy department to perform pharmacist prescription modification?

APPENDIX 2: Supplementary tables presenting the results of subgroup analyses. For all subgroup analyses, dichotomized subgroup responses were compared with independent *t* tests. Questions for which the difference between subgroups was significant (p < 0.05) are indicated in bold; any *p* value > 0.05 was deemed nonsignificant.

TABLE S1. Subgroup Analysis: Existing Prescription Modification Policy or Medi	cal Directive		
Question	Question Mean: Existing Policy or Medical Directive (n = 56)	Question Mean: No Policy or Medical Directive (n = 215)	<i>p</i> Value
Self-efficacy Excluding narcotics, controlled drugs, or targeted substances, how sure are you that you could:			
a) Perform a patient assessment to modify any medication order?	6.0 out of 7 Very sure	5.4 out of 7 Quite sure	<0.001
b) Modify any medication order in a clinical area that you are familiar with?	6.2 out of 7 Very sure	5.7 out of 7 Very sure	<0.001
c) Modify any medication order in a clinical area that you are not familiar with?	3.6 out of 7 Rather sure	3.1 out of 7 Somewhat sure	0.039
d) Modify any medication order for patients starting a new therapy in hospital?	4.8 out of 7 Quite sure	4.5 out of 7 Quite sure	0.25
e) Modify any medication order for patients continuing a pre-existing therapy from home?	5.5 out of 7 Very sure	5.3 out of 7 Quite sure	0.22
f) Perform appropriate documentation for the rationale of modifying a medication order?	6.1 out of 7 Very sure	6.0 out of 7 Very sure	0.25
g) Accept responsibility for medication management?	6.0 out of 7 Very sure	5.6 out of 7 Very sure	0.019
Support from practice environment Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followin medication order?	ng factors affect your a	bility to modify any	
a) Amount of pharmacy staffing?	3.3 out of 5 Not a factor	3.0 out of 5 Not a factor	0.17
b) Current patient load and/or other workload?	2.9 out of 5 Not a factor	2.6 out of 5 Not a factor	0.15
c) Technology?	3.5 out of 5 Weak support	3.6 out of 5 Weak support	0.43
d) Physical practice environment?	3.6 out of 5 Weak support	3.4 out of 5 Not a factor	0.26
e) Employer's expectations?	4.2 out of 5 Weak support	3.6 out of 5 Weak support	<0.001
Support from interprofessional relationships Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi medication order?	ng factors affect your a	bility to modify any	
a) Relationship with prescribers?	4.6 out of 5 Strong support	4.0 out of 5 Weak support	<0.001
b) Relationship with nursing and allied health professionals?	4.6 out of 5 Strong support	4.3 out of 5 Weak support	0.007

TABLE S2. Subgroup Analysis: Gender			
Question	Question Mean: Male (n = 67)	Question Mean: Female (n = 203)	<i>p</i> Value
Self-efficacy Excluding narcotics, controlled drugs, or targeted substances, how sure are you that you could:			
a) Perform a patient assessment to modify any medication order?	5.8 out of 7 Very sure	5.5 out of 7 Very sure	0.06
b) Modify any medication order in a clinical area that you are familiar with?	5.9 out of 7 Very sure	5.8 out of 7 Very sure	0.84
c) Modify any medication order in a clinical area that you are not familiar with?	3.6 out of 7 Rather sure	3.1 out of 7 Somewhat sure	0.036
d) Modify any medication order for patients starting a new therapy in hospital?	4.8 out of 7 Quite sure	4.5 out of 7 Quite sure	0.08
e) Modify any medication order for patients continuing a pre-existing therapy from home?	5.3 out of 7 Quite sure	5.3 out of 7 Quite sure	0.99
f) Perform appropriate documentation for the rationale of modifying a medication order?	5.9 out of 7 Very sure	6.0 out of 7 Very sure	0.53
g) Accept responsibility for medication management?	5.8 out of 7 Very sure	5.7 out of 7 Very sure	0.33
Support from practice environment Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followir medication order?	ng factors affect your a	bility to modify any	
a) Amount of pharmacy staffing?	3.3 out of 5 Not a factor	3.0 out of 5 Not a factor	0.14
b) Current patient load and/or other workload?	2.6 out of 5 Not a factor	2.7 out of 5 Not a factor	0.69
c) Technology?	3.5 out of 5 Weak support	3.7 out of 5 Weak support	0.33
d) Physical practice environment?	3.3 out of 5 Not a factor	3.5 out of 5 Weak support	0.46
e) Employer's expectations?	3.6 out of 5 Weak support	3.7 out of 5 Weak support	0.30
Support from interprofessional relationships Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followir medication order?	ng factors affect your a	bility to modify any	
a) Relationship with prescribers?	4.0 out of 5 Weak support	4.2 out of 5 Weak support	0.25
b) Relationship with nursing and allied health professionals?	4.4 out of 5 Weak support	4.3 out of 5 Weak support	0.81

Question	Question Mean: 0–9 Years of Practice (n = 103)	Question Mean: ≥ 10 Years of Practice (n = 168)	p Value
Self-efficacy Excluding narcotics, controlled drugs, or targeted substances, how sure are you that you could:			
a) Perform a patient assessment to modify any medication order?	5.6 out of 7 Very sure	5.5 out of 7 Very sure	0.97
b) Modify any medication order in a clinical area that you are familiar with?	5.9 out of 7 Very sure	5.8 out of 7 Very sure	0.28
c) Modify any medication order in a clinical area that you are not familiar with?	3.1 out of 7 Somewhat sure	3.2 out of 7 Somewhat sure	0.66
d) Modify any medication order for patients starting a new therapy in hospital?	4.7 out of 7 Quite sure	4.5 out of 7 Quite sure	0.22
e) Modify any medication order for patients continuing a pre-existing therapy from home?	5.5 out of 7 Very sure	5.2 out of 7 Quite sure	0.06
f) Perform appropriate documentation for the rationale of modifying a medication order?	6.1 out of 7 Very sure	5.9 out of 7 Very sure	0.12
g) Accept responsibility for medication management?	5.8 out of 7 Very sure	5.7 out of 7 Very sure	0.42
Support from practice environment Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi medication order?	ng factors affect your a	bility to modify any	1
a) Amount of pharmacy staffing?	3.4 out of 5 Not a factor	2.8 out of 5 Not a factor	0.001
b) Current patient load and/or other workload?	2.9 out of 5 Not a factor	2.5 out of 5 Not a factor	0.025
c) Technology?	3.4 out of 5 Not a factor	3.7 out of 5 Weak support	0.12
d) Physical practice environment?	3.6 out of 5 Weak support	3.3 out of 5 Not a factor	0.05
e) Employer's expectations?	3.8 out of 5 Weak support	3.6 out of 5 Weak support	0.10
Support from interprofessional relationships Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi medication order?	ng factors affect your a	bility to modify any	
a) Relationship with prescribers?	4.0 out of 5 Weak support	4.2 out of 5 Weak support	0.19
b) Relationship with nursing and allied health professionals?	4.3 out of 5 Weak support	4.4 out of 5 Weak support	0.26

	Question Mean:	Question Mean:	
	Education in Canada	Education Outside of Canada	
Question	(<i>n</i> = 237)	(<i>n</i> = 34)	p Value
Self-efficacy Excluding narcotics, controlled drugs, or targeted substances, how sure are you that you could:	·		
a) Perform a patient assessment to modify any medication order?	5.6 out of 7 Very sure	5.4 out of 7 Quite sure	0.49
b) Modify any medication order in a clinical area that you are familiar with?	5.9 out of 7 Very sure	5.6 out of 7 Very sure	0.38
c) Modify any medication order in a clinical area that you are not familiar with?	3.2 out of 7 Somewhat sure	3.2 out of 7 Somewhat sure	0.95
d) Modify any medication order for patients starting a new therapy in hospital?	4.5 out of 7 Quite sure	4.7 out of 7 Quite sure	0.56
e) Modify any medication order for patients continuing a pre-existing therapy from home?	5.3 out of 7 Quite sure	5.3 out of 7 Quite sure	0.91
f) Perform appropriate documentation for the rationale of modifying a medication order?	6.0 out of 7 Very sure	5.7 out of 7 Very sure	0.15
g) Accept responsibility for medication management?	5.7 out of 7 Very sure	5.4 out of 7 Quite sure	0.22
Support from practice environment Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi medication order?	ng factors affect your a	bility to modify any	
a) Amount of pharmacy staffing?	3.1 out of 5 Not a factor	2.6 out of 5 Not a factor	0.07
b) Current patient load and/or other workload?	2.7 out of 5 Not a factor	2.2 out of 5 Weak barrier	0.06
c) Technology?	3.6 out of 5 Weak support	4.0 out of 5 Weak support	0.08
d) Physical practice environment?	3.4 out of 5 Not a factor	3.4 out of 5 Not a factor	0.95
e) Employer's expectations?	3.7 out of 5 Weak support	3.4 out of 5 Not a factor	0.22
Support from interprofessional relationships Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi nedication order?	ng factors affect your a	bility to modify any	
a) Relationship with prescribers?	4.2 out of 5 Weak support	4.0 out of 5 Weak support	0.53

	Question Mean: BScPharm or Entry-Level PharmD	Question Mean: Postgrad PharmD or Other Postgrad Pharmacy Degree	
Question	(<i>n</i> = 204)	(<i>n</i> = 67)	p Value
Self-efficacy Excluding narcotics, controlled drugs, or targeted substances, how sure are you that you could:			
a) Perform a patient assessment to modify any medication order?	5.5 out of 7 Very sure	5.6 out of 7 Very sure	0.99
b) Modify any medication order in a clinical area that you are familiar with?	5.8 out of 7 Very sure	5.8 out of 7 Very sure	0.94
c) Modify any medication order in a clinical area that you are not familiar with?	3.2 out of 7 Somewhat sure	3.1 out of 7 Somewhat sure	0.75
d) Modify any medication order for patients starting a new therapy in hospital?	4.5 out of 7 Quite sure	4.7 out of 7 Quite sure	0.48
e) Modify any medication order for patients continuing a pre-existing therapy from home?	5.3 out of 7 Quite sure	5.4 out of 7 Quite sure	0.62
f) Perform appropriate documentation for the rationale of modifying a medication order?	6.0 out of 7 Very sure	6.0 out of 7 Very sure	0.86
g) Accept responsibility for medication management?	5.7 out of 7 Very sure	5.6 out of 7 Very sure	0.40
Support from practice environment Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi medication order?	ng factors affect your a	bility to modify any	1
a) Amount of pharmacy staffing?	3.0 out of 5 Not a factor	3.1 out of 5 Not a factor	0.49
b) Current patient load and/or other workload?	2.6 out of 5 Not a factor	2.9 out of 5 Not a factor	0.12
c) Technology?	3.5 out of 5 Weak support	3.9 out of 5 Weak support	0.06
d) Physical practice environment?	3.4 out of 5 Not a factor	3.5 out of 5 Weak support	0.43
e) Employer's expectations?	3.7 out of 5 Weak support	3.7 out of 5 Weak support	0.80
Support from interprofessional relationships Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi medication order?	ng factors affect your a	bility to modify any	
a) Relationship with prescribers?	4.2 out of 5 Weak support	4.1 out of 5 Weak support	0.83
b) Relationship with nursing and allied health professionals?	4.4 out of 5 Weak support	4.2 out of 5 Weak support	0.10

TABLE S6. Subgroup Analysis: Residency Training			
Question	Question Mean: Residency Training (n = 91)	Question Mean: No Residency Training (n = 180)	<i>p</i> Value
Self-efficacy Excluding narcotics, controlled drugs, or targeted substances, how sure are you that you could:			
a) Perform a patient assessment to modify any medication order?	5.6 out of 7 Very sure	5.5 out of 7 Very sure	0.93
b) Modify any medication order in a clinical area that you are familiar with?	5.9 out of 7 Very sure	5.8 out of 7 Very sure	0.25
c) Modify any medication order in a clinical area that you are not familiar with?	3.2 out of 7 Somewhat sure	3.2 out of 7 Somewhat sure	0.81
d) Modify any medication order for patients starting a new therapy in hospital?	4.5 out of 7 Quite sure	4.5 out of 7 Quite sure	0.96
e) Modify any medication order for patients continuing a pre-existing therapy from home?	5.4 out of 7 Quite sure	5.3 out of 7 Quite sure	0.51
f) Perform appropriate documentation for the rationale of modifying a medication order?	6.1 out of 7 Very sure	5.9 out of 7 Very sure	0.14
g) Accept responsibility for medication management?	5.8 out of 7 Very sure	5.7 out of 7 Very sure	0.61
Support from practice environment Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi medication order?	ing factors affect your a	bility to modify any	
a) Amount of pharmacy staffing?	3.0 out of 5 Not a factor	3.1 out of 5 Not a factor	0.64
b) Current patient load and/or other workload?	2.7 out of 5 Not a factor	2.6 out of 5 Not a factor	0.68
c) Technology?	3.6 out of 5 Weak support	3.6 out of 5 Weak support	0.90
d) Physical practice environment?	3.5 out of 5 Weak support	3.4 out of 5 Not a factor	0.65
e) Employer's expectations?	4.0 out of 5 Weak support	3.5 out of 5 Weak support	0.001
Support from interprofessional relationships Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followi medication order?	ing factors affect your a	bility to modify any	
a) Relationship with prescribers?	4.4 out of 5 Weak support	4.0 out of 5 Weak support	<0.001
b) Relationship with nursing and allied health professionals?	4.5 out of 5 Strong support	4.3 out of 5 Weak support	0.037

TABLE S7. Subgroup Analysis: Hospital Size					
Question	Question Mean: ≤ 500 Beds (<i>n</i> = 212)	Question Mean: > 500 Beds (<i>n</i> = 59)	<i>p</i> Value		
Self-efficacy Excluding narcotics, controlled drugs, or targeted substances, how sure are you that you could:					
a) Perform a patient assessment to modify any medication order?	5.5 out of 7 Very sure	5.7 out of 7 Very sure	0.19		
b) Modify any medication order in a clinical area that you are familiar with?	5.7 out of 7 Very sure	6.2 out of 7 Very sure	0.006		
c) Modify any medication order in a clinical area that you are not familiar with?	3.2 out of 7 Somewhat sure	3.2 out of 7 Somewhat sure	0.99		
d) Modify any medication order for patients starting a new therapy in hospital?	4.4 out of 7 Rather sure	4.9 out of 7 Quite sure	0.037		
e) Modify any medication order for patients continuing a pre-existing therapy from home?	5.3 out of 7 Quite sure	5.5 out of 7 Very sure	0.29		
f) Perform appropriate documentation for the rationale of modifying a medication order?	5.9 out of 7 Very sure	6.2 out of 7 Very sure	0.023		
g) Accept responsibility for medication management?	5.7 out of 7 Very sure	5.9 out of 7 Very sure	0.20		
Support from practice environment Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followir medication order?	ng factors affect your a	bility to modify any			
a) Amount of pharmacy staffing?	3.2 out of 5 Not a factor	2.7 out of 5 Not a factor	0.012		
b) Current patient load and/or other workload?	2.7 out of 5 Not a factor	2.4 out of 5 Weak barrier	0.11		
c) Technology?	3.6 out of 5 Weak support	3.5 out of 5 Weak support	0.44		
d) Physical practice environment?	3.4 out of 5 Not a factor	3.5 out of 5 Weak support	0.81		
e) Employer's expectations?	3.7 out of 5 Weak support	3.7 out of 5 Weak support	0.98		
Support from interprofessional relationships Excluding narcotics, controlled drugs, or targeted substances, to what extent would the followir medication order?	ng factors affect your a	bility to modify any			
a) Relationship with prescribers?	4.1 out of 5 Weak support	4.4 out of 5 Weak support	0.007		
b) Relationship with nursing and allied health professionals?	4.3 out of 5 Weak support	4.4 out of 5 Weak support	0.28		