

**Evidence-based Claims Adjudication:  
A Technology-based Learning Tool for Automobile Insurance Claims  
Adjusters**

by

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fulfillment of the requirements for the degree of

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## THESIS EXAMINATION INFORMATION

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### **Master of Health Sciences in Community, Public and Population Health**

Thesis title: Evidence-based Claims Adjudication: A Technology-based Learning Tool for Automobile Insurance Claims Adjusters

An oral defense of this thesis took place on March 27, 2020 in front of the following examining committee:

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The above committee determined that the thesis is acceptable in form and content and that a satisfactory knowledge of the field covered by the thesis was demonstrated by the candidate during an oral examination. A signed copy of the Certificate of Approval is available from the School of Graduate and Postdoctoral Studies.

## **ABSTRACT**

My thesis aimed to 1) develop an evidence-based claims adjudication framework for automobile insurance claims adjusters; 2) develop a technology-based learning (TBL) tool to train Aviva Canada claims adjusters about evidence-based claims adjudication and the evidence-based management of neck pain; and 3) evaluate the learning, design and engagement constructs of the tool. I adapted Sackett's evidence-based medicine framework for claims adjudication. I conducted a systematic review of the literature to determine the effectiveness of TBL tools to improve claims adjusters' knowledge of clinical practice guidelines. I developed an online, asynchronous, self-directed, module-based curriculum. I evaluated the learner-centered constructs of the TBL tool in a sample of adjusters using a validated questionnaire. Results indicated the majority of participating adjusters agreed with the learning, design and engagement constructs of the TBL tool. My research can be used to inform future development of online tools to educate and train adjusters about clinical evidence.

**Keywords:** Automobile Insurance; Clinical Practice Guidelines; Instructional Design; Pedagogy; Technology-based Learning

## **AUTHOR'S DECLARATION**

I hereby declare that this thesis consists of original work of which I have authored. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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The research work in this thesis was performed in compliance with the regulations of the Research Ethics Board under **REB Certificate #15254**.

Keshini Moodley

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## STATEMENT OF CONTRIBUTIONS

Chapter 3 has been accepted for publication:

Moodley K, Cancelliere C, Power R, Côté P. Evidence-based Claims Adjudication of Traffic Injury Claims in Ontario: Shifting the Focus from Cost to Care. *Journal of Insurance Medicine* (accepted June 18, 2019).

I adapted Dr. Sackett's evidence-based medicine framework to develop the concept and components of evidence-based claims adjudication.

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"Action without vision is only passing time, vision without action is merely daydreaming,  
but vision with action can change the world."

*-Nelson Mandela*

## TABLE OF CONTENTS

THESIS EXAMINATION INFORMATION .....	ii
ABSTRACT .....	iii
AUTHOR'S DECLARATION.....	iv
STATEMENT OF CONTRIBUTIONS .....	v
ACKNOWLEDGEMENTS .....	vi
TABLE OF CONTENTS.....	viii
LIST OF TABLES .....	xvi
LIST OF FIGURES .....	xvii
LIST OF NOMENCLATURE AND ABBREVIATIONS .....	xviii
CHAPTER 1: INTRODUCTION .....	1
Introduction .....	2
Burden of Traffic Injuries .....	2
Common Traffic Injuries.....	3
Rehabilitation and Claims Challenges .....	3
Claims Costs .....	3
Ontario Automobile Insurance System .....	4
Automobile Insurance is the Law.....	4
No-fault and Tort Insurance.....	4
Accident Benefits .....	5
Role of Accident Benefits Claims Adjusters .....	5



Applicability of Clinical Practice Guidelines to Accident Benefits Claims .....	6
Potential Barrier .....	6
The Potential Benefits of Evidence-based Claims Adjudication .....	7
Teaching and Learning in the Insurance Industry .....	7
The Use of Technology .....	8
Benefits of Technology-based Learning for Corporations .....	8
Challenges of Technology-based Learning for Corporations .....	9
Employee Motivation .....	9
Critical Success Factors .....	10
Pedagogical and Instructional Design Decision-making .....	10
Use of Video .....	10
Objectives .....	11
General Objective .....	11
Specific Objectives .....	11
References .....	13

**CHAPTER 2: ARE TECHNOLOGY-BASED LEARNING TOOLS EFFECTIVE IN IMPROVING  
KNOWLEDGE ABOUT CLINICAL PRACTICE GUIDELINES IN AUTOMOBILE INSURANCE  
CLAIMS ADJUSTERS? A SYSTEMATIC REVIEW OF THE LITERATURE .....16**

Abstract .....	17
Background .....	17
Objective .....	17
Study Design .....	17
Method .....	17
Result .....	17
Conclusion .....	18
Introduction .....	19

Methodology.....	21
Study Design.....	21
Literature Search Strategy .....	21
Information Sources.....	21
Inclusion and Exclusion Criteria .....	21
Outcome.....	22
Screening.....	22
Results .....	22
Discussion.....	24
Strengths .....	25
Limitations.....	25
Conclusion .....	25
References.....	26
 <b>CHAPTER 3: EVIDENCE-BASED CLAIMS ADJUDICATION OF TRAFFIC INJURY CLAIMS IN ONTARIO: SHIFTING THE FOCUS FROM COST TO CARE .....</b>	 <b>28</b>
Abstract .....	29
Background .....	29
Objective .....	29
Method.....	29
Conclusion .....	29
Introduction .....	30
Automobile Insurance within the Ontario Context .....	31
Accident Benefits Claims.....	31
Role of Claims Adjusters .....	32
Evidence-based Clinical Practice Guidelines for the Management of Traffic Injuries..	33

Need for an Evidence-based Claims Adjudication Framework.....	34
Evidence-based Medicine as a Framework to Develop Evidence-based Claims	
Adjudication .....	34
Components of Evidence-based Medicine .....	35
Clinical Judgement .....	35
Patients' Values and Preferences .....	35
Relevant Scientific Evidence .....	36
Evidence-based Claims Adjudication .....	36
Components of Evidence-based Claims Adjudication .....	38
Claimants' Values .....	38
Adjuster Expertise and Judgement .....	38
Clinicians' Expertise.....	39
Use of Current Best Clinical Evidence .....	39
Role of Effective Communication .....	39
Steps for Making Evidence-based Claims Adjudication Decisions.....	40
Claimant-centered Care .....	46
Use of Evidence-based Claims Adjudication .....	47
Conclusion .....	47
References.....	48
 <b>CHAPTER 4: DEVELOPMENT AND EVALUATION OF A TECHNOLOGY-BASED LEARNING TOOL FOR THE EVIDENCE-BASED CLAIMS ADJUDICATION OF ONTARIO COMMON TRAFFIC INJURY CLAIMS .....</b>	 <b>51</b>
Abstract .....	52
Introduction .....	52
Objective .....	52
Study Design.....	52

Method.....	52
Result.....	53
Conclusion .....	53
Introduction .....	54
Methods: Objective 1- Development of the Technology-based Learning Tool.....	55
Procedures .....	55
Phase 1: Observation of Aviva Claims Adjusters.....	56
Study Design.....	56
Site Visits .....	56
Analysis.....	56
Phase 2: Consultation with Aviva Claims Advisory Committee, Managers and Claims Learning and Development.....	57
Study Design.....	57
Advisory Committee Formation and Consultation .....	57
Analysis.....	57
Phase 3: Pedagogical and Instructional Design Decision-making.....	58
Presentational Features of Written Text, Video and Audio Narration .....	60
Phase 4: Storyboarding .....	61
Creation and Presentation of the Technology-based Learning Tool .....	61
Learning Tool Content and Structure.....	63
Methods: Objective 2- Evaluation of the Technology-based Learning Tool.....	64
Study Design.....	64
Study Population .....	64
Recruitment .....	64
Data Collection .....	65
Baseline Questionnaire .....	65
Learning Object Evaluation Scale for Students .....	66

Study Amendment .....	67
Analysis.....	68
Quantitative Component (LOES-S and Quiz Results) .....	68
Qualitative Component (Open-ended Question) .....	68
Results .....	69
Objective 1: Development of the Technology-based Learning Tool .....	69
Phase 1: Observation of Aviva Claims Adjusters.....	69
Phase 2: Consultation with the Aviva Advisory Committee .....	71
Objective 2: Evaluation of the Technology-based Learning Tool .....	74
Participant Characteristics (n=37).....	76
Evaluation of the Technology-based Learning Tool (n=16) .....	76
Technology-based Learning Tool Evaluation .....	78
Quantitative Component .....	78
Optional Knowledge Assessments .....	79
Discussion Boards .....	79
Technology-based Learning Tool Evaluation .....	79
Qualitative Component.....	79
Discussion.....	80
Interpretation of Participants Comments.....	80
Optional Knowledge Assessments .....	82
Flexible Learning .....	83
Discussion Boards .....	83
Strengths .....	84
Limitations.....	84
Conclusion .....	85

References.....	86
<b>CHAPTER 5: DISCUSSION AND CONCLUSION.....</b>	<b>89</b>
Introduction .....	90
Summary of Results .....	90
Systematic Review of the Literature .....	90
Development of the Evidence-based Claims Adjudication Framework .....	90
Development of the Technology-based Learning Tool.....	91
Evaluation of the Technology-based Learning Tool.....	91
Significance of the Research for Automobile Insurance Claims Adjudication .....	92
Personal Reflection .....	95
Strengths .....	96
Limitations.....	96
Conclusion and Next Steps.....	97
References.....	98
<b>APPENDICES .....</b>	<b>99</b>
Appendix A: MEDLINE Search Strategy.....	100
Appendix B: Overview of Pedagogy, Instructional Design Principles and TBL Tool Application .....	102
Appendix C: Email Scripting for Vice-President of Claims .....	115
Appendix D: Study Information Letter .....	117
Appendix E: Informed Consent Form.....	121
Appendix F: Baseline Questionnaire .....	128
Appendix G: Announcement Scripting for Front-line Managers .....	135
Appendix H: One-paged Flyer .....	137

Appendix I: Study Email Scripting and YouTube Cartoon Video Frames .....	138
Appendix J: Potential Questions/Answers Scripting for Front-line Managers .....	140
Appendix K: Learning Object Evaluation Scale for Students.....	144
Appendix L: Learning Object Evaluation Scale for Students (Raw Study Results) .....	145
Appendix M: Module Quiz Results for True/False and Multiple Choice Questions and the Number and Proportion of Times Answers Selected .....	146

## LIST OF TABLES

Table 1. Evidence-based Claims Adjudication Guided Questions for Adjuster Self-Reflection .....	44
Table 2. Learning Tool Modules and Number of Quiz Questions Contained in Each Module .....	63
Table 3. Aviva Field Observations and Themes.....	69
Table 4. Aviva Advisory Committee Preferences and Themes.....	71
Table 5. Participant Characteristics .....	76
Table 6. Learning Object Evaluation Scale for Students (LOES-S Study Results) .....	78
Table 7. Participant Comments (Open-ended Question) .....	79



## LIST OF FIGURES

Figure 1. Flow Diagram of Identification and Selection of Articles .....	23
Figure 2. Sackett’s Evidence-based Medicine.....	35
Figure 3. The Proposed Evidence-based Claims Adjudication Framework .....	37
Figure 4. Steps for Making Evidence-based Claims Adjudication Decisions when Reviewing Treatment Plans .....	41
Figure 5. Screenshot of the Curriculum Homepage in Canvas .....	62
Figure 6. Screenshot of the Aviva Curriculum Adaptation .....	62
Figure 7. Flow Diagram of Participation and Enrollment.....	75

## LIST OF NOMENCLATURE AND ABBREVIATIONS

**Accident Benefits (AB)** – The benefits that insured persons may receive if they are injured or killed in a motor vehicle collision. Benefits may include: income replacement benefit, medical and rehabilitation benefits, attendant care benefit, death and funeral benefits etc.

**Adjuster** – “A person acting on behalf of an insurer or an insured, for compensation, directly or indirectly solicits the right to negotiate the settlement of or investigate a loss or claim under a contract or a fidelity, surety or guaranty bond issued by an insurer, or investigates, adjusts or settles any such loss or claim,” (Government of Ontario Laws, *Insurance Act, R.S.O.*, 1990).

**Synonym:** Aviva Canada refers to their Accident Benefits adjusters as “Healthcare Services Advisors.”

**ARCS** – Attention, relevance, confidence and satisfaction.

**Claims Adjudication** – The process of investigating a loss (claim for damages) and determining whether a claim will be paid or denied.

**CPG** – Clinical Practice Guideline.

**Google Forms** – Online app to create forms for data collection.

**LMS** – Learning Management System.

**LOES-S** – Learning Object Evaluation Scale for Students.

**Online** – Available for access via the Internet.

**Statutory Accident Benefits Schedule (SABS)** – A regulation under the Ontario Insurance Act which stipulates the rights and responsibilities of insurers in relation to automobile insurance Accident Benefits.

**TBL** – Technology-based Learning.

**WAD** – Whiplash Associated Disorder.

## CHAPTER 1: INTRODUCTION

## **Introduction**

My master's thesis involved developing an evidence-based claims adjudication framework, which can be used by insurers to integrate clinical evidence into the adjudication of traffic injury claims. My research also involved developing and evaluating a technology-based learning (TBL) tool, designed to educate and train a sample of Aviva Canada Healthcare Services adjusters about evidence-based claims adjudication and the evidence-based management of recent onset neck pain.

My research was completed by partnering with Aviva Canada, one of the largest property and casualty insurers in Canada, providing home, automobile and business insurance to consumers.<sup>1</sup> The development and implementation of the learning tool was completed in collaboration with claims adjusters and managers, and the claims learning and development team at Aviva Canada, in addition to educational technology and clinical epidemiology researchers at the University of Ontario Institute of Technology (Ontario Tech University).

This section provides contextual background for my thesis project, including an overview of the Ontario automobile insurance compensation system and justification for the development of an evidence-based claims adjudication framework for automobile insurance traffic injury claims.

## **Burden of Traffic Injuries**

In Canada, injuries sustained in motor vehicle collisions cost approximately \$2.2 billion dollars annually.<sup>2</sup> In 2013, there were 59,570 persons injured in traffic collisions in Ontario.<sup>3</sup> Most injuries resulted from rear-end collisions followed by single vehicle collisions.<sup>3</sup> Most injuries sustained were minor (23.3% of injured persons were treated in hospital but were not admitted) or minimal (27.9% of injured persons did not go to hospital but sustained minor abrasions, bruises and complaints of pain).<sup>3</sup> While, 0.5% of injuries were fatal (persons killed immediately or within 30 days of the collision), or major (2.2% of injured persons admitted to hospital).<sup>3</sup>

### *Common Traffic Injuries*

The most common traffic injury is whiplash-associated disorders (WAD).<sup>4,5</sup> However, following traffic collisions it is currently understood that a large proportion of individuals report pain over multiple bodily areas and it is uncommon for neck pain to occur in isolation.<sup>6</sup> It has been suggested that within 30 days following a motor vehicle collision posterior neck pain is reported as the most prevalent complaint (86.2%) followed by posterior shoulder pain (75%), head pain (72%), mid back pain (66%), and low back pain (60%).<sup>6</sup> Consequently, multiple symptoms are common following whiplash injury and many of the symptoms, including psychological symptoms are non-specific.<sup>7</sup>

### *Rehabilitation and Claims Challenges*

Although common traffic injuries are non-life threatening soft-tissue injuries, the rehabilitation and prognosis of injuries such as whiplash is complicated. Evidence suggests that soft tissue injuries can be treated with uncomplicated, short-term, cost-effective interventions such as education, reassurance and exercise, making recovery a viable goal.<sup>8,9</sup> However, most interventions used to treat whiplash in clinical practice are not supported by scientific evidence.<sup>4,5,8,9</sup> The use of non-evidence-based interventions can delay recovery and contribute to the development persistent pain and iatrogenic disability.<sup>8</sup> Furthermore, claims adjusters are ill-equipped to make evidence-based claims decisions about the clinical care proposed by clinicians. Therefore, this may impact claimant recovery because adjusters are not required to critically appraise treatment plans for effectiveness and safety of the therapeutic interventions proposed by clinicians.

### *Claims Costs*

Although whiplash is a non-life threatening common traffic injury, the average Accident Benefits cost per claim in Ontario (not limited to strictly whiplash) in 2013, was \$31,786.<sup>10</sup> Furthermore, it has been suggested that it can take one to two or more years to close a soft-tissue injury claim in Ontario.<sup>11</sup> This makes claimant recovery and file closure a continuous challenge for automobile insurers. Non-evidence-based claims decisions can put a significant financial burden on the automobile insurance compensation system

because disputes often arise over what constitutes appropriate clinical diagnosis and treatment.<sup>11</sup> In 2013, insurers spent \$346.9 million dollars for assessments and insurer's examinations in order to assess and diagnose claimants' injuries, determine an appropriate course of treatment and assess the present and future disability status.<sup>10</sup>

### **Ontario Automobile Insurance System**

In Ontario, automobile insurance is private and insurance companies sell insurance policies to consumers.<sup>12</sup> In principle, the private system enables insurers to remain competitive by offering choice of product, policy options and competitive rates to consumers.<sup>12</sup> Although private, the Financial Services Commission of Ontario (a branch of the Ministry of Finance) regulates the automobile insurance industry.<sup>13</sup> The regulatory framework, which stipulates the benefits and compensation that an injured person (collision) may be eligible for, is the Statutory Accident Benefits Schedule.<sup>14</sup> All insurers are expected to adjudicate Accident Benefits claims in accordance with the Statutory Accident Benefits Schedule.

#### *Automobile Insurance is the Law*

Automobile insurance is mandatory in Ontario; thus, by law, all motorists must purchase automobile insurance before driving a vehicle.<sup>13</sup> The mandatory insurance coverages include direct compensation property damage, Accident Benefits, third-party liability, and uninsured motorist coverage.<sup>13</sup> Incidentally, Ontario has one of the highest insurance premium rates in Canada. In 2015, Ontarians paid an average of approximately \$1458 versus \$930 annually in other Canadian provinces and territories.<sup>11</sup>

#### *No-fault and Tort Insurance*

The Ontario automobile insurance system is a hybrid compensation system, blending no-fault insurance and tort. No-fault insurance means that regardless of fault; insured individuals involved in a collision can receive compensation directly from his or her own automobile insurer.<sup>15</sup> Under a no-fault system, fault determination is not required prior to compensation.<sup>15</sup> Under tort law, the determination of fault, through a court of law

precedes damage compensation.<sup>16</sup> Hence, if an individual is not at fault for a collision then they have the right under the tort to sue the at-fault driver for additional compensation such as pain and suffering.<sup>17</sup>

### **Accident Benefits**

Accident Benefits are part of the compulsory coverages mandated by the Ontario government. This coverage provides benefits if an individual is injured or killed as a result of a motor vehicle collision.<sup>13,14</sup> Following a traffic collision, an injured person can make a claim to her or his insurer for injuries sustained in the collision and apply for Statutory Accident Benefits.<sup>13,14</sup> Once the claim is made, an Accident Benefits claims adjuster is assigned to adjudicate the injury claim and initiate the process by asking the claimant to complete the application for Accident Benefits. The application enables the injured person to apply for benefits if they require treatment or cannot return to work because of the injuries sustained in the collision.<sup>13,14</sup>

### **Role of Accident Benefits Claims Adjusters**

The Ontario Insurance Act (1990) defines an adjuster as a “person acting on behalf of an insurer or an insured, for compensation, directly or indirectly solicits the right to negotiate the settlement of or investigate a loss or claim under a contract or a fidelity, surety or guaranty bond issued by an insurer, or investigates, adjusts or settles any such loss or claim.”<sup>14</sup> Accident Benefits claims adjusters manage the injury portion of a claim and adjudicate claims according to the provincial regulations set out by the Statutory Accident Benefits Schedule.<sup>14</sup> Adjusters are responsible for managing claims costs, providing claimants with high-quality customer service and facilitating recovery from the traffic injuries. However, most claims adjusters lack knowledge of clinical evidence necessary to make evidence-based claims decisions. Traditional claims adjudication is based on an actuarial approach of indemnification and is focused on claims costs and adherence to the Statutory Accident Benefits Schedule. Thus, the best available clinical evidence on the effectiveness and safety of interventions is not used to inform claims adjudication by insurers. This is significant because claims adjusters are responsible for deciding whether

to approve, partially approve or deny funding for any clinical intervention submitted by regulated healthcare practitioners.

In Ontario, Accident Benefits claims adjusters are the gatekeepers of claimants' medical and rehabilitation benefits and act as intermediaries between claimants, clinicians, legal representatives and employers. Nevertheless, the Statutory Accident Benefits Schedule does not mandate the use of the best available clinical evidence to adjudicate claims.<sup>14</sup> However, adjusters have the right under the regulations to request independent medical assessments from clinicians to provide recommendations and opinions on diagnosis, prognosis and treatment.<sup>14</sup> Claims decisions that are not informed by current best scientific evidence may lead to high financial burden on the automobile insurance compensation system because of disagreement over what constitutes an appropriate diagnosis and clinically indicated treatment.<sup>11</sup> However, an evidence-based framework to adjudicate automobile insurance injury claims could help to reduce disputes.<sup>18</sup>

### **Applicability of Clinical Practice Guidelines to Accident Benefits Claims**

One promising strategy to improve the management of insurance claims in Ontario is the use of clinical practice guidelines by claims adjusters. Clinical practice guidelines are statements, which include recommendations intended to optimize patient healthcare.<sup>19</sup> They are informed by systematic reviews of evidence and provide an assessment of benefits and harms of alternate care options.<sup>19</sup> Clinical practice guidelines may be useful to injury claims adjusters because they can be used to compare the clinical interventions proposed by clinicians with those recommended by scientific evidence.<sup>20</sup> Therefore, clinical practice guidelines can provide claims adjusters with necessary information to assist with making evidence-based claims decisions about therapeutic interventions. Introducing Accident Benefits claims adjusters to clinical evidence and providing them with the appropriate training and tools to use clinical information could benefit the injured claimant when adjudicating traffic injury claims.

### ***Potential Barrier***

Prior research suggests that a potential barrier to compliance with practice guidelines in



the Australian automobile insurance industry is the poor perception of evidence by claims adjusters.<sup>21</sup> This potential barrier may also be true for Ontario Accident Benefits adjusters because the Statutory Accident Benefits Schedule does not mandate the use of best available clinical evidence when adjudicating traffic injury claims.<sup>14</sup>

There is a need to educate claims adjusters and all insurers about the value and significance of evidence-based practice and care. For the purpose of my thesis, I developed a TBL tool that introduced learners to evidence, evidence-based medicine, evidence-based claims adjudication and clinical practice guidelines. This knowledge is a prerequisite to understanding the benefits of clinical evidence, including practice guidelines. Once given the appropriate learning tools, adjusters should be afforded the opportunity to construct their own understanding and realization of the importance of clinical evidence and the significance of integrating evidence into the adjuster role to make evidence-based claims decisions.<sup>22,23</sup>

### **The Potential Benefits of Evidence-based Claims Adjudication**

The current automobile insurance industry may benefit from adopting an evidence-based claims framework because it would allow adjusters to: 1) critically appraise the value of clinical interventions proposed by clinicians;<sup>18</sup> 2) engage in informed and meaningful discussions with clinicians about the interventions being used to treat the injuries;<sup>18</sup> and 3) discuss the most appropriate options with clinicians and claimants.<sup>18,20</sup> These informed discussions could also encourage the development of collaborative working relationships between parties involved in the rehabilitation of injured claimants. On the other hand, the use of non-evidence-based interventions can delay recovery and contribute to the development of chronic pain and iatrogenic disability.<sup>8</sup> Therefore, insurers' use of the evidence-based claims adjudication framework could help to improve the health outcomes of injured claimants and may result in faster claim closures and reduced claims costs.<sup>18</sup>

### **Teaching and Learning in the Insurance Industry**

Traditional instructor-led classroom training remains the most common method of

corporate teaching and learning.<sup>24,25,26</sup> However, technological advancements are leading to a shift away from the brick and mortar method of teaching and learning to one of an online learning environment. The online learning environment requires learners to be self-directed and engaged because there may be fewer resources and prompts from the instructor to keep learners on path with the learning goals.<sup>27</sup> It has been argued that the limitations of traditional in-house classroom approach have prompted the emergence of online learning as a training alternative for corporations.<sup>24</sup> Some of the noted limitations include difficulty in gathering the necessary training assets, such as a training location and qualified trainers.<sup>28,29</sup> Finally, traditional training content is not always tailored to the needs of the corporate adult learner.<sup>28,29</sup>

### **The Use of Technology**

Technology-based learning tools provide an efficient means of learning by incorporating electronic means to deliver the learning content.<sup>30</sup> However, as noted by Clarke, the use of technology itself does not influence learning; rather, it is the actual teaching methods that facilitate effective learning.<sup>31</sup> Clarke also observed that media serves as a method to deliver information that does not produce adverse effects in learning outcomes.<sup>31</sup> In opposition to Clarke's assertions, Kozma argued that media and more so, different forms of media serves to be more than just a mode of delivering educational instruction; it is both the medium and the teaching methods employed in the instructional design that influences learning.<sup>32,33</sup> Therefore, when considering the implementation of online learning for adult learners of a corporation, careful consideration must be given to reasons why technology should be used rather than the traditional approach, which has been in-house face-to-face instructor-led learning.<sup>24,26</sup>

### **Benefits of Technology-based Learning for Corporations**

Some of the benefits of adopting TBL for corporations include convenience, flexibility, accessibility, and consistency.<sup>26</sup> It can be difficult to find a convenient time for workers to pause their work and attend a training session.<sup>34</sup> Online learning enables employees to receive training at any time, from anywhere, on any device; thereby reducing lost time

and lost productivity.<sup>34</sup> Employees can learn using any computer platform at the times and places which are suitable to them. Web-based learning has the capability to include a variety of teaching methods such as audio, text, graphics, video, and external links for information exploration.<sup>26,28,34</sup> Online learning provides the opportunity to design instruction that adapts to learners' learning styles to help improve knowledge transfer.<sup>26,35</sup> Online training is also less intimidating than in-class instructor led courses.<sup>33</sup> It has been suggested that a good learning tool shows the consequences of learners' actions and where and why they went wrong.<sup>34</sup> After a failure, learners have the opportunity to go back and try again.<sup>34</sup> This type of learning experience eliminates the embarrassment of failure in front of a large or small group.<sup>34</sup>

### **Challenges of Technology-based Learning for Corporations**

Some of the challenges associated with implementing technology-based learning in corporations are that employees must take initiative and have the required computer skills to log onto an online lesson.<sup>26</sup> It has been argued that online learning becomes purposeless if employees are not trained to use online platforms.<sup>26</sup> Therefore, attention must be given to ensuring that learners have the technical skills to participate in online learning.<sup>26</sup> Also, most adult learners acquire their learning skills in a traditional classroom environment.<sup>26</sup> Therefore, consideration must be given to assisting these learners in adapting their learning strategies and techniques to the online environment and developing online learning by factoring in existing learner strategies.<sup>26</sup>

### **Employee Motivation**

Regardless of the technology used, or the instructional mode used to deliver information, corporate trainers must always consider employees motivation to participate when designing a training program. Online learning may become purposeless if employees are not motivated to use it.<sup>24</sup> It has been suggested that online information systems fail in 30% of cases because instructional designers did not recognize the differences of learners' abilities and motivation to adopt online learning.<sup>36,37</sup> Moreover, the age of the corporate learner is important to consider because older employees may not be familiar with the

variety of computing devices that exist today.

### *Critical Success Factors*

Consideration of critical success factors can help to determine whether employees will accept and participate in online courses.<sup>28</sup> The first critical success factor is internal marketing; employees respond better to online learning when it is promoted in advance and they feel prepared.<sup>28</sup> The second critical success factor is support; employees value and respond to online learning when they feel that they have the appropriate technical, subject matter, and managerial support.<sup>28</sup> The last critical success factor is incentive; employees respond to online learning when they can see the value of what they will be learning.<sup>28</sup>

### **Pedagogical and Instructional Design Decision-making**

The development of the TBL tool for my thesis focused on making good pedagogical and instructional design decisions. Important elements of instructor self-efficacy are exercising good pedagogical and instructional design judgement.<sup>38</sup> For example, it is important to determine in which learning situations, learners could benefit from the use of technology. Thereafter, it is important to find the most appropriate technological tools to integrate into the instruction.<sup>38</sup>

### *Use of Video*

The use of video in online education will be used to illustrate the importance of making good instructional design decisions. Video has supported education for many years and instructional videos play a key role in online education but there are pros and cons of using videos in online instruction.<sup>39</sup> Evidence suggests that some of the benefits of instructional video include learners being given the opportunity to learn at their own pace and videos permitting instant playback, rewind and pause, which gives learners access to educational materials as often as required.<sup>40,41</sup> A disadvantage is that technology does not always work 100% of the time.<sup>42</sup> Furthermore, instructional video is not a “silver bullet;” meaning, the use of video alone will not promote effective learning and increase learner

motivation.<sup>43</sup>

After consultation meetings with Aviva claims adjusters and managers, it was determined that videos would be included in the learning tool because it was an overall learning preference. Accordingly, instructional videos were created to offer learners a variety of visual elements, to enhance the overall learning experience and to enable the learner to be in full control of the learning material and the pace in which they learn.<sup>40</sup> In addition, the videos were specifically created to teach and introduce adjusters to new concepts such as “evidence-based claims adjudication” and “claimant-centered care” to enable learners with little to no prior knowledge to process these concepts more easily.<sup>44</sup> The videos’ content were broken down into small segments and the videos were restricted to well under four minutes in length in order to retain learner attention.<sup>39</sup> Consequently, pedagogical and instructional design decision-making are key factors that can impact learner engagement, motivation to learn and knowledge transfer in corporate learning environments.

## **Objectives**

### *General Objective*

The purpose of my thesis was to develop and evaluate a technology-based learning tool to educate and train Aviva claims adjusters about evidence-based claims adjudication for the management of Neck Pain and Its Associated Disorders (grades 1 & 2, 0-3 months post collision).

### *Specific Objectives*

My research aims to:

1. Systematically review and synthesize the literature on the effectiveness of technology-based learning tools used to improve insurance claims adjusters’ knowledge about clinical practice guidelines.

2. Develop an evidence-based claims adjudication framework for Accident Benefits claims adjudication in the automobile insurance compensation system.
3. Develop a new technology-based learning tool to educate and train Aviva Healthcare Services adjusters on evidence-based claims adjudication and the evidence-based management of recent onset neck pain.
4. Evaluate the learning, design and engagement constructs of the newly developed technology-based learning tool using the Learning Object Evaluation Scale for Students (LOES-S).

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**CHAPTER 2: ARE TECHNOLOGY-BASED LEARNING TOOLS EFFECTIVE IN IMPROVING  
KNOWLEDGE ABOUT CLINICAL PRACTICE GUIDELINES IN AUTOMOBILE INSURANCE  
CLAIMS ADJUSTERS? A SYSTEMATIC REVIEW OF THE LITERATURE**

## **Abstract**

### *Background*

Advancements in technology are changing the ways in which people learn new knowledge and skills. Technology-based learning (TBL) tools can be used to educate automobile insurance claims adjusters about clinical practice guidelines. However, little is known about the effectiveness of TBL tools to educate and improve claims adjusters' knowledge of clinical practice guidelines.

### *Objective*

To synthesize the evidence on the effectiveness of TBL tools used to improve knowledge of clinical practice guidelines among automobile insurance claims adjusters.

### *Study Design*

Systematic review of the literature and best evidence synthesis.

### *Method*

Five electronic databases were systematically searched (MEDLINE, ABI/INFORM, Education Source, ERIC and LearnTechLib) from inception to April 2019. Studies examining the effectiveness of TBL tools developed to improve claims adjusters' knowledge of clinical practice guidelines were searched. A two-phase screening process was used to determine the eligibility of studies. In phase 1, pairs of independent reviewers screened citation titles and abstracts to determine eligibility. Citations were classified as either eligible, ineligible, or possibly eligible. In phase 2, the same pairs of reviewers individually screened possibly eligible articles to determine eligibility. Articles deemed eligible progressed to critical appraisal to assess internal validity.

### *Result*

The initial electronic database search yielded 959 potential articles. Two articles were possibly eligible after phase one screening. However, both studies were deemed

ineligible following full text review in phase 2 screening. In one study, the intervention was not eligible and the other study did not measure change and/or improvement in knowledge following the educational intervention. Therefore, no studies were critically appraised.

### *Conclusion*

No studies investigating the effectiveness of TBL tools developed to improve claims adjusters' knowledge about clinical practice guidelines were found. Further research is needed to determine whether TBL tools are an effective method for improving knowledge of practice guidelines in automobile insurance claims adjusters.

## Introduction

Traditional instructor-led classroom teaching is the predominant method of corporate teaching.<sup>1,2,3</sup> However, it is associated with several limitations including the scarcity of training resources (ensuring appropriate training location and qualified instructors), and training content not being tailored to the needs of the corporate learner.<sup>4,5</sup> These limitations can be overcome by technology-based learning (TBL). Advancements in technology are shaping the ways in which individuals learn and work. In today's corporate workforce, employees have to process large amounts of new information in a shorter amount of time.<sup>6</sup> It has been argued that companies spend more money on transporting and housing trainees than on the actual training programs.<sup>6</sup> Thus, time spent away from the job for traveling to learn or sitting in a classroom/training room impacts employee productivity.<sup>4,5,6</sup> Finally, it can be difficult to find a convenient time to take workers out of their work environment for training purposes.<sup>6</sup>

An alternative to traditional instructor-led teaching is online learning. Online learning is a form of TBL that allows corporate learners to be trained anytime, anywhere and on any device.<sup>6</sup> This type of learning may, therefore improve corporate employees' productivity.<sup>6</sup> The benefits of adopting TBL for corporations include convenience, flexibility, accessibility and consistency of education.<sup>3</sup>

Due to the rapid advances in technology, industry employee skills may require a shift from processing skill sets to digital skill sets.<sup>7</sup> For example, it has been suggested that the proportion of baby boomers retiring in the insurance industry is five times higher than other financial sectors.<sup>7</sup> This presents an additional impetus to change training delivery methods as incoming younger hires may have different learning preferences and skill sets. It has been suggested that skill upgrading will be needed for approximately 50% of insurance related jobs.<sup>7</sup> Traditionally, online learning in insurance has predominantly been used for compliance training.<sup>7</sup> However, given the fast pace at which insurance processes and procedures can change, corporate trainers/instructors can no longer solely be relied on to teach employees.<sup>7</sup> Through careful consideration of

pedagogy, online learning can help to improve employee satisfaction and learning.<sup>7</sup> Adopting TBL can also help deal with rapid changes in insurance processes and procedures. For example, online teaching methods can be an inexpensive and scalable option which can be used to educate claims adjusters about clinical evidence. Online case studies can provide realistic and situated examples to learners and online learning can provide employees with immediate access to self-paced, self-directed learning.<sup>7</sup>

In Ontario, Accident Benefits claims adjusters handle injury claims and decide whether to approve, partially approve or deny funding for clinical interventions recommended by regulated healthcare practitioners. Typically, these decisions are made without considering the best available clinical evidence on the effectiveness and safety of interventions. Most adjusters lack medical and rehabilitation expertise and knowledge of clinical evidence, including clinical practice guidelines.

Knowledge of clinical practice guidelines would enable claims adjusters to make evidence-based medical and rehabilitation decisions.<sup>8</sup> Claims adjusters would benefit from adopting the evidence-based claims framework because it would allow adjusters to:

- 1) critically appraise the clinical interventions recommended by healthcare practitioners;<sup>9</sup>
- 2) engage in informed and meaningful discussions with healthcare practitioners about the interventions being used to treat injured claimants;<sup>9</sup> and
- 3) discuss the most appropriate treatment options with healthcare practitioners to facilitate claimant recovery.<sup>9,10</sup>

Therefore, there is a need to understand if TBL tools are effective in improving claims adjusters' knowledge of practice guidelines. The purpose of this systematic review was to synthesize the best available evidence on the effectiveness of online learning tools developed to improve insurance claims adjusters' knowledge of clinical practice guidelines.

The PRISMA statement was used to guide the reporting of this systematic review.<sup>11</sup>

## **Methodology**

### *Study Design*

A systematic review of the literature and best evidence synthesis of studies involving insurance claims adjusters.

### *Literature Search Strategy*

A search strategy was developed with the assistance of an experienced health sciences librarian to search MEDLINE (Appendix A). The search strategy combined Medical Subject Heading (MeSH) terms and text words (title, abstract and author keywords) to capture the following concepts: 1) clinical practice guidelines (CPGs) and 2) insurance claims adjusters.

### *Information Sources*

MEDLINE (Ovid) was searched from inception to April 2019. The MEDLINE search strategy was adapted to search other databases. Additional searches from inception to April 2019 were conducted in the business database ABI/INFORM (ProQuest), Education Source (EBSCOhost), ERIC (ProQuest) and LearnTechLib. EndNote X7 was used to create a bibliographic database to manage the search results.

### *Inclusion and Exclusion Criteria*

Studies with the following characteristics were included: 1) published in English; 2) randomized controlled trials, cohort studies, case-control studies or pre-post trials; 3) investigated a technology-based learning tool to teach about clinical practice guidelines (a TBL tool is a means of learning, which incorporates technology, by electronic means, as a method for delivery of the learning content;<sup>12</sup> 4) measured change and/or improvement in knowledge; and 5) investigated insurance claims adjuster populations (an insurance claims adjuster is a “person acting on behalf of an insurer or an insured, for compensation, directly or indirectly solicits the right to negotiate the settlement of or investigate a loss

or claim under a contract or a fidelity, surety or guaranty bond issued by an insurer, or investigates, adjusts or settles any such loss or claim”).<sup>13</sup>

The following studies were excluded: 1) guidelines, letters, editorials, commentaries, government reports, books, book chapters, conference proceedings, meeting abstracts, lectures and addresses, consensus development statements, and guideline statements; 2) case reports, case series, qualitative studies, non-systematic and systematic reviews, clinical practice guidelines, biomechanical studies, laboratory studies, studies not reporting on methodology; and 3) studies investigating insurance physicians as the target population.

### *Outcome*

The review focused on studies measuring a change and/or improvement in knowledge following the implementation of an educational intervention utilizing a TBL tool. The authors' definitions of “knowledge” along with their means of assessing knowledge change and/or improvement were accepted as indicated.

### *Screening*

The search results (record numbers, titles, and abstracts) were imported into an Excel worksheet. Articles were screened in two phases using the inclusion and exclusion criteria previously described. In phase 1, a pair of reviewers independently screened article titles and abstracts for eligibility and rated each article as either eligible, ineligible, or possibly eligible. In phase 2 the same reviewers screened the full text of the possibly eligible articles to determine eligibility. Any disagreements were resolved through discussion.

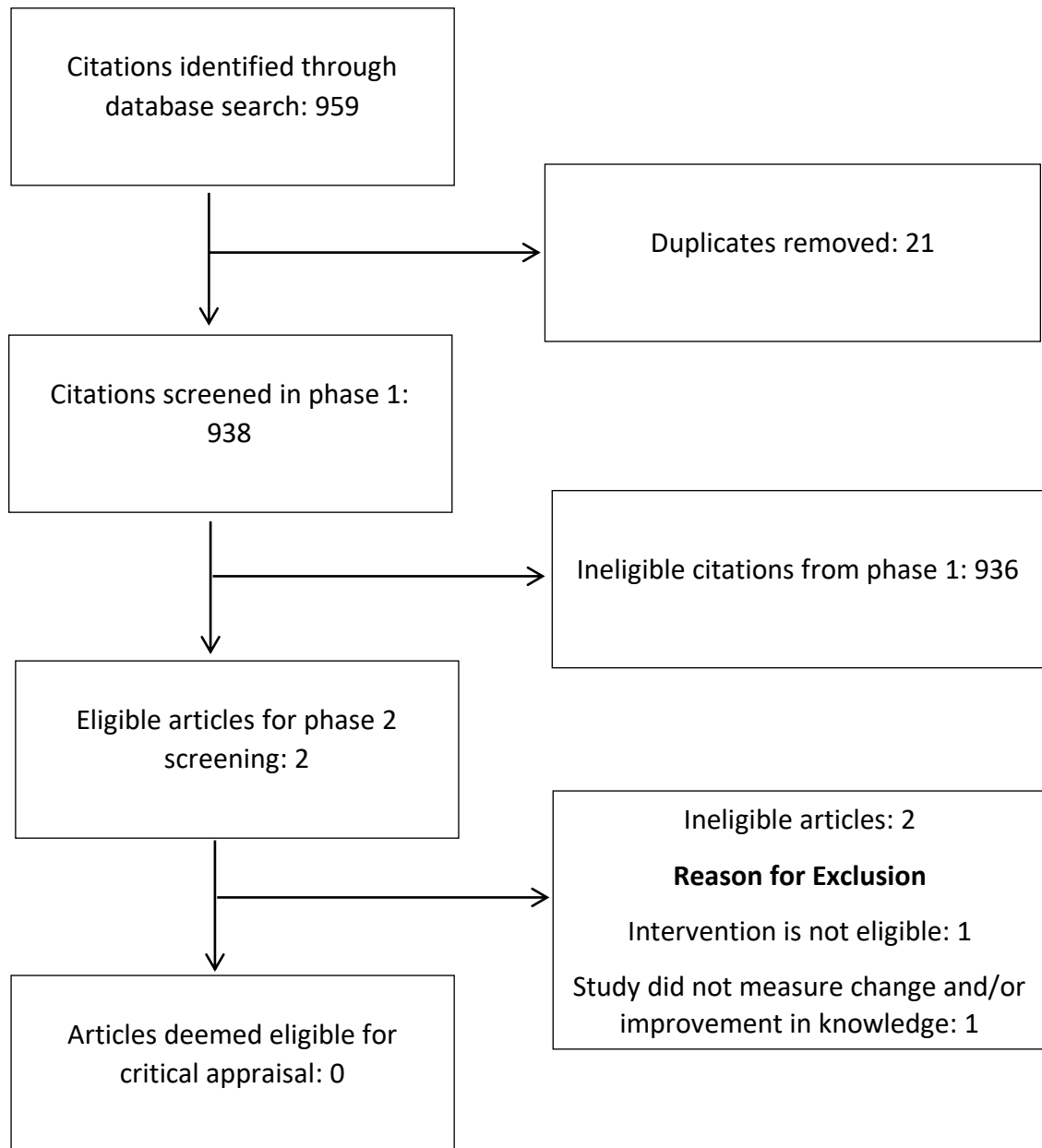
## **Results**

A total of 959 citations were identified by the MEDLINE search (Figure 1). However, no studies were identified in the business and education databases. After removing duplicates, 938 citations were screened in phase 1. Phase 1 screening yielded two possibly eligible articles, but both articles were deemed ineligible in phase 2 screening because



one study used an ineligible intervention type and the other did not measure a change and/or improvement in knowledge.<sup>8,10</sup>

Figure 1. Flow Diagram of Identification and Selection of Articles



## Discussion

This systematic review aimed to synthesize the best available evidence on the effectiveness of online learning tools developed to improve claims adjusters' knowledge of clinical practice guidelines. However, no studies were found. Scientifically rigorous research should be conducted to investigate the effectiveness of technology-based learning/online learning tools to improve claims adjusters' knowledge of practice guidelines; similar to research related to the effectiveness of online learning to improve knowledge or skills with practice guidelines amongst healthcare professionals.

In healthcare practitioner populations, current evidence suggests that online learning of evidence-based healthcare (pure or blended learning) in comparison to no learning helps to increase evidence-based healthcare knowledge and skills in healthcare professionals.<sup>14</sup> Furthermore, research suggests that there is no statistical difference in knowledge improvement and skills when comparing online learning to face-to-face learning.<sup>14,15</sup> Thus, both online and face-to-face learning can be beneficial to improve knowledge.<sup>14</sup> In terms of clinical practice guidelines, evidence suggests that online learning is more effective than no learning and equally effective to traditional learning in terms of knowledge change and or/improvement.<sup>16</sup>

Some examples of specific interventions tested to disseminate clinical practice guidelines in health professionals and their results include: website studies, which have shown improvements in perceived usefulness and perceived ease of use, but not for knowledge, usability, barriers, and intentions.<sup>17</sup> Computer software studies have shown improvements in perceived usefulness, but not in knowledge and skills.<sup>17</sup> Web-based workshop and email studies have shown improvements in knowledge, perceived usefulness, and skills.<sup>17</sup> Finally, electronic educational game interventions demonstrated an improvement in knowledge from baseline to 12 or 24 weeks.<sup>17</sup> Systematically examining the scientific literature for topics related to online learning and implementation strategies for healthcare professionals may help to inform research in

the automobile insurance sector as related to implementation, learning, and knowledge transfer of clinical evidence, including clinical practice guidelines.

### **Strengths**

A search strategy was developed with the assistance of an experienced health sciences librarian to capture all possibly eligible articles. Also, clearly defined study inclusion and exclusion criteria were developed *a priori* for the two-phase screening and selection process.

### **Limitations**

One potential limitation is that only studies published in the English language were included. However, evidence suggests that other reviews of scientific trials have also limited searches to the English language and this did not result in biased findings.<sup>18</sup>

### **Conclusion**

This systematic review highlights the lack of evidence regarding the effectiveness of TBL tools to improve insurance claims adjusters' knowledge of clinical practice guidelines. Scientifically rigorous research is warranted to determine the effectiveness of TBL interventions to improve adjusters' knowledge about practice guidelines. However, research into the use of online learning tools designed to meet the training needs of healthcare professionals may shed light into the effectiveness, limitations and considerations that could be factored into the development of future online learning tools for claims adjusters.

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**CHAPTER 3: EVIDENCE-BASED CLAIMS ADJUDICATION OF TRAFFIC INJURY CLAIMS IN  
ONTARIO: SHIFTING THE FOCUS FROM COST TO CARE**

## **Abstract**

### *Background*

In the Ontario automobile insurance system, claims adjusters decide whether to approve, partially approve or deny funding for clinical interventions submitted by healthcare practitioners. Typically, these decisions are made based on cost, without considering the evidence on the effectiveness and safety of the interventions.

### *Objective*

Develop an evidence-based claims adjudication framework which can be used by automobile insurers to integrate clinical evidence into claims adjudication.

### *Method*

We adapted the evidence-based medicine framework developed by Sackett<sup>1</sup> to develop a framework for evidence-based claims adjudication.

### *Conclusion*

An evidence-based claims adjudication framework may help insurers make claim decisions that will promote recovery of individuals injured in traffic collisions and reduce claims costs. The effectiveness and implementation of the framework needs to be evaluated.

## Introduction

Traffic injuries are a public health problem, which places a significant burden on Canadians and the healthcare system. In 2013 in Ontario, there were 59,570 persons injured in collisions, the main mechanisms of collision were rear-end and single vehicle collisions.<sup>2</sup> Although most traffic injuries are non-life threatening soft-tissue injuries, the medical and rehabilitation costs related to these injuries are exorbitant. In 2013, the average Accident Benefits cost per claim was \$31,786.<sup>3</sup>

The most common traffic injury is whiplash-associated disorders (WAD).<sup>4,5</sup> The prognosis of WAD is complex, and its clinical management often relies on treatments that are ineffective and may promote disability.<sup>6</sup> Therefore, there is an opportunity to improve the management of traffic injuries by adopting evidence-based interventions. The delivery of ineffective clinical interventions and claims decisions that are not supported by evidence puts a substantial financial burden on both the automobile insurance and public healthcare systems. The use of ineffective interventions can delay recovery and contribute to the development chronic pain and iatrogenic disability.<sup>6</sup>

In 2017, David Marshall completed a review of the Ontario automobile insurance system for the Ontario Minister of Finance.<sup>7</sup> Marshall's report included recommendations to improve the delivery of healthcare services to individuals injured in motor vehicle collisions.<sup>7</sup> Specifically, Marshall recommended that evidence-based clinical care pathways be adopted to improve health outcomes and insurers should change their approach from closing claims and managing costs to providing effective claims care to claimants.<sup>7</sup> This shift from cost to care requires that claims adjusters acquire knowledge about effective clinical evidence and rehabilitation.

The adoption and implementation of evidence-based care pathways by insurers is complex and involves a shift in the approach to adjudicate traffic injuries claims. An evidence-based approach would require that insurers embrace a new philosophy and collaboratively engage with claimants and all parties involved in the claim. We propose that an evidence-based claims adjudication framework is necessary to achieve this goal



and improve the automobile insurance system by shifting the focus from cost to care. Our evidence-based claims adjudication framework was inspired by the evidence-based medicine model developed by Sackett et al.<sup>1</sup> Our paper aims to introduce the concept of evidence-based claims adjudication and describe how an evidence-based claims framework could assist automobile insurers to shift their business models from cost to care.

### **Automobile Insurance within the Ontario Context**

Automobile insurance is mandatory in Ontario and insurance products are delivered to consumers by private insurance companies.<sup>8</sup> In theory, this system enables insurers to offer competitive pricing to consumers.<sup>9</sup> The Financial Services Commission of Ontario, a branch of the Ministry of Finance, regulates the automobile insurance industry.<sup>10</sup> The Statutory Accident Benefits Schedule outlines the benefits and compensation available to an injured person in the case of injury.<sup>10,11</sup> Insurers are expected to adjudicate injury claims in accordance with the regulations set out by the Statutory Accident Benefits Schedule.<sup>10</sup>

The Ontario automobile insurance system is a hybrid compensation system, blending no-fault insurance and tort.<sup>12</sup> Under no-fault insurance, fault determination is not required prior to compensation and injured individuals can receive compensation directly from their automobile insurer.<sup>12</sup> Thus, individuals are required to go to their own insurer for Accident Benefits. However, if the individual is not at fault for the collision, then they are entitled under the tort, to seek additional compensation, such as pain and suffering.<sup>13</sup>

### **Accident Benefits Claims**

Following a traffic collision, an injured person can submit a claim for injuries to their insurer and apply for Statutory Accident Benefits. Statutory Accident Benefits include medical and rehabilitation, income replacement, attendant care, and non-earner benefits etc.<sup>10</sup> A claims adjuster is then assigned to initiate the application process for Accident Benefits and adjudicate the injury claim. This application enables the injured person to apply for Statutory Accident Benefits in the event they require medical treatment or

cannot return back to work due to their injuries.<sup>10,11</sup>

The current Ontario automobile insurance industry lacks an evidence-based framework to adjudicate injury claims. Traditional claims adjudication is based on an actuarial approach of indemnification and is focused on claims costs and adherence to the Statutory Accident Benefits Schedule. The Statutory Accident Benefits Schedule does not mandate the use of current best clinical evidence to adjudicate traffic injury claims. Rather, it refers to the Minor Injury Guideline, which is not an evidence-based guideline.<sup>14</sup> The Minor Injury Guideline covers all soft tissue injuries and their associated clinical sequelae.<sup>14</sup> The guideline was developed and implemented in September 2010 as a temporary measure until evidence-based treatment protocols could be developed.<sup>15</sup> While the concept of evidence-based practice is not new, evidence-based claims adjudication still remains absent from Ontario's automobile insurance industry.

### **Role of Claims Adjusters**

The Ontario Insurance Act defines an adjuster as a “person acting on behalf of an insurer or an insured, for compensation, directly or indirectly solicits the right to negotiate the settlement of or investigate a loss or claim under a contract or a fidelity, surety or guaranty bond issued by an insurer, or investigates, adjusts or settles any such loss or claim.”<sup>10</sup> Accident benefits claims adjusters handle the injury portion of a claim and are responsible for managing costs and facilitating claimants return to pre-collision health status. The adjuster has the responsibility to decide whether to approve, partially approve or deny funding for any clinical intervention submitted by regulated healthcare practitioners. However, most adjusters lack medical and rehabilitation expertise and they are not knowledgeable about evidence-based medicine and clinical evidence, including clinical practice guidelines. Therefore, claims adjusters are ill-equipped to make evidence-based claims decisions about the clinical care recommended by healthcare practitioners. This is problematic because non-evidence-based claims decisions may put an enormous financial burden on the automobile insurance compensation system because disputes often arise over what constitutes appropriate diagnosis and treatment.<sup>7</sup> In Ontario, in

2013, there were approximately 22,259 mediation applications filed and 15,355 arbitration applications filed.<sup>3</sup>

### **Evidence-based Clinical Practice Guidelines for the Management of Traffic Injuries**

In 2012, the Ontario government and the Financial Services Commission of Ontario commissioned the development of new evidence-based treatment protocols for the management of traffic injuries.<sup>15</sup> The new Common Traffic Injury treatment protocols developed by Côté et al. were submitted to the Ontario government and the Financial Services Commission of Ontario on January 31, 2015.<sup>15,16</sup> The implementation and provincial regulation of evidence-based programs of care in the automobile insurance industry would replace the current Minor Injury Guideline.

From 2012-2014, Côté et al. conducted 43 systematic reviews to determine the effectiveness of the various interventions available to treat common traffic injuries.<sup>16</sup> The Common Traffic Injury Guidelines cover the following impairments:

1. Physical impairments: grades 1 to 3 neck pain and its associated disorders; headaches associated with neck pain; non-specific thoracic and lumbar spine pain, thoracic and lumbar radiculopathy [nerve root injury]; grades 1 and 2 girdle and limb sprains and strains; grades 1 and 2 sprains and strains of the temporomandibular joint; skin and muscle contusions, abrasions and skin lacerations (which do not extend beneath the dermis).<sup>16</sup>
2. Mental impairments: concussion/mild traumatic brain injury as defined by the American Congress of Rehabilitation Medicine (MTBI is defined by loss of consciousness of less than 30 minutes, with altered consciousness less than 24 hours, and post-traumatic amnesia less than 1 day, and a Glasgow Coma Scale of 13 to 15) and normal structural imaging.<sup>16</sup>
3. Psychological impairments: early psychological signs and symptoms that include

poor expectations of recovery, post-collision depressive symptomatology, fear, anger and frustration.<sup>16</sup>

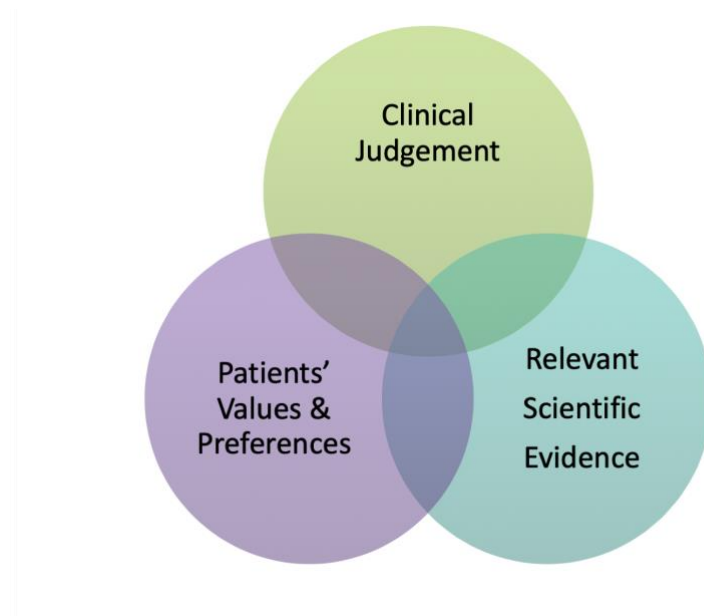
### **Need for an Evidence-based Claims Adjudication Framework**

The development of new evidence-based clinical practice guidelines provides a timely opportunity to modernize claims adjudication in Ontario. Knowledge of clinical practice guidelines would enable claims adjusters to make evidence-based medical and rehabilitation decisions.<sup>17</sup> The current automobile insurance industry would benefit from adopting an evidence-based claims framework because it would allow adjusters to: 1) critically appraise the clinical interventions proposed by healthcare practitioners; 2) engage in informed and meaningful discussions with healthcare practitioners about the interventions being used to treat injuries; and 3) discuss the most appropriate treatment options with healthcare practitioners to facilitate claimant recovery.<sup>18</sup>

### **Evidence-based Medicine as a Framework to Develop Evidence-based Claims Adjudication**

Evidence-based medicine is the process of lifelong, self-directed learning.<sup>19,20</sup> Furthermore, it is the preferred approach for healthcare. The model emphasizes a patient-centered approach that integrates the best available clinical evidence into clinical decision-making. Evidence-based medicine is defined as the “conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.”<sup>1(p71)</sup> The components of evidence-based medicine include clinical judgement, patients’ values and preferences, and relevant scientific evidence; the framework is depicted in Figure 2. The competent clinician is the one who integrates all three components understanding that neither one alone is enough to make evidence-based decisions.<sup>1</sup>

Figure 2. Evidence-based Medicine, Sackett et al.<sup>1</sup>



### **Components of Evidence-based Medicine**

#### *Clinical Judgement*

Clinical judgement refers to the proficiency and expertise that clinicians acquire through clinical experience and practice.<sup>1</sup> Clinical judgement is exemplified through proficient, efficient and effective clinical diagnosis.<sup>1,19</sup> Clinical judgement is also required to accurately predict the course and progression of a medical condition and correctly administer the prescribed regimen.<sup>21</sup> This component also refers to the sum total of all the cognitive processes associated with clinical decision-making and the proper application of clinical knowledge and expertise to the clinical case.<sup>22</sup>

#### *Patients' Values and Preferences*

Patients' values and preferences refers to the notion that patients have opinions about their clinical treatment based on their diagnosis, personal values, experiences, family, insurance, and other factors.<sup>21</sup> Clinicians should be compassionate and considering of patient preferences when making clinical decisions about their care, in order to improve health outcomes and better the quality of care provided.<sup>23</sup> It has been suggested that the

competent clinician include patients' values and preferences when making clinical decisions.<sup>24</sup>

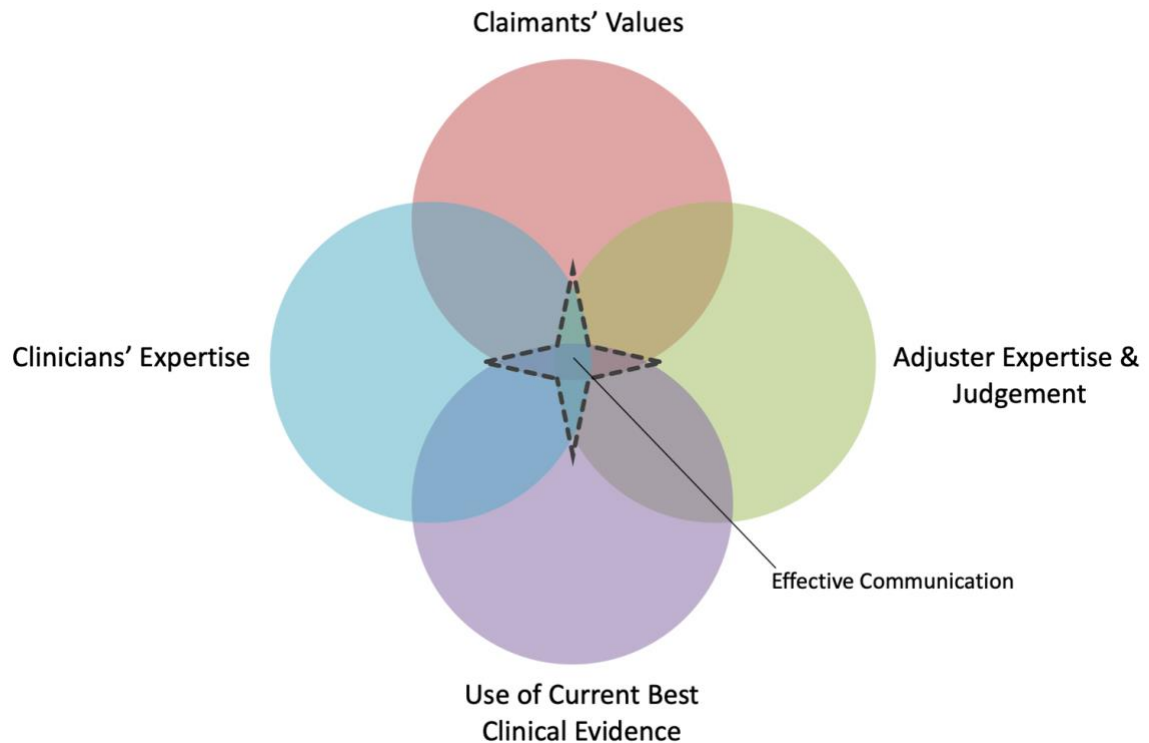
### *Relevant Scientific Evidence*

According to Sackett and Rosenberg many clinicians base their clinical decisions on the "extrapolations of pathophysiological principles and logic rather than established facts based on data derived from patients."<sup>25(p330)</sup> However, clinicians should refer to the best available clinical evidence to make clinical decisions about a patient's care in order to prevent clinical decisions from becoming outdated.<sup>1,19</sup> Sackett et al. describe best clinical evidence as "clinically relevant research, often from the basic sciences of medicine, but especially from patient centered clinical research into the accuracy and precision of diagnostic tests (including the clinical examination), the power of prognostic markers, and the efficacy and safety of therapeutic, rehabilitative, and preventive regimens."<sup>1(p71-72)</sup>

### **Evidence-based Claims Adjudication**

We define evidence-based claims adjudication as the astute, diligent and direct use of current best available clinical evidence to make claims decisions and facilitate claimants' recovery following motor vehicle collisions. Evidence-based claims adjudication integrates: 1) claimants' values; 2) adjuster expertise and judgement; 3) clinicians' expertise; and 4) use of current best available clinical evidence to help adjusters make claims decisions about the appropriateness of proposed therapeutic interventions. We adapted the revised model for evidence-based clinical decision making proposed by Haynes, Deveraux and Guyatt to the automobile insurance environment.<sup>21</sup> We emphasize that effective communication is fundamental to evidence-based claims adjudication as a means to integrate the four components (Figure 3).

Figure 3. The Proposed Evidence-based Claims Adjudication Framework



Similar to evidence-based medicine, all components are necessary to practice evidence-based claims adjudication.<sup>1</sup> The competent and empathetic claims adjuster will draw upon the four components when practicing evidence-based claims adjudication. Adjusters need to draw on their expertise and wisdom to rationalize and interpret how the clinical evidence fits with the claimant's values and predicament. Adjusters will also need to consult with and consider clinicians' expertise and rationales for treatment recommendations and make insightful claims decisions. Finally, adjusters will need to understand the importance of effective communication and become effective communicators when educating claimants and conveying concerns, rationales, decisions and other pertinent information to all parties involved in the claim.

## **Components of Evidence-based Claims Adjudication**

### *Claimants' Values*

Claimants' values refers to the beliefs, expectations, experiences and opinions that a person holds about their healthcare and the handling of their claim by the insurer as a result of the collision and subsequent injury.<sup>21,26,27</sup> Adjusters need to empathize with a claimant's values and expectations. Adjusters will also need to consider the claimant's preferences for treatment options. In addition, adjusters will need to inquire and listen to claimant's values and effectively communicate with claimants in a non-biased and non-judgmental manner. It is important for adjusters to be sensitive and cognizant to the notion that being involved in a traffic collision is a traumatic event for many people, regardless of the severity of injury.<sup>27</sup> Mutual trust between a claimant and the adjuster should be established from the inception of the claim through empathy and acknowledging and demonstrating an appreciation of a claimant's values.<sup>27</sup>

### *Adjuster Expertise and Judgement*

Adjuster expertise and judgement refers to the knowledge, skills and wisdom acquired by adjusters through the years of adjudicating traffic injury claims.<sup>1,28</sup> The development of expertise and judgement comes with experience. Early in their careers, adjusters handle uncomplicated claims gradually progressing to more complicated claims. As experience grows, adjusters improve their communication skills and proficiency in exercising judgement and making sound claims decisions. In addition, adjusters also become more efficient at interpreting the Statutory Accident Benefits Schedule and accurately forecasting the total amount of funds that will be required to manage the life of a claim. Thus, the expertise and judgement acquired by adjudicating claims contributes to making sound claims decisions and minimizing errors. Errors in claims adjudication can result in disputes, additional expenditures and unsatisfied claimants.



### *Clinicians' Expertise*

Clinicians play key roles in the recovery of injured claimants. Through formal and continued education, as well as clinical practice and experience, clinicians gain medical and rehabilitation knowledge and expertise. Therefore, it is important for adjusters to consult with clinicians when managing a claimant's file; this is particularly important when ineffective treatments are prescribed. Adjusters should effectively communicate with clinicians to understand the clinical indication and evidential basis for the prescribed treatment. This will assist adjusters to make shared and informed decisions regarding proposed treatment requests.

### *Use of Current Best Clinical Evidence*

Using evidence refers to adjusters acquiring and implementing evidence-based knowledge when making decisions about treatment requests. Utilizing this approach means that observations, opinions and compelling arguments which are not supported by scientifically rigorous, trustworthy clinical evidence are not sufficient to make sound decisions about a claimant's care. Insurers must recognize that knowledge of clinical evidence needs to be prioritized. Insurers will need to stay abreast with the developments of clinically relevant research and clinical practice guidelines, as they are updated. It is paramount that adjusters are taught to understand clinical evidence from the perspective of treatment effectiveness and safety so they can distinguish between interventions that will likely lead to claimant recovery.

### **Role of Effective Communication**

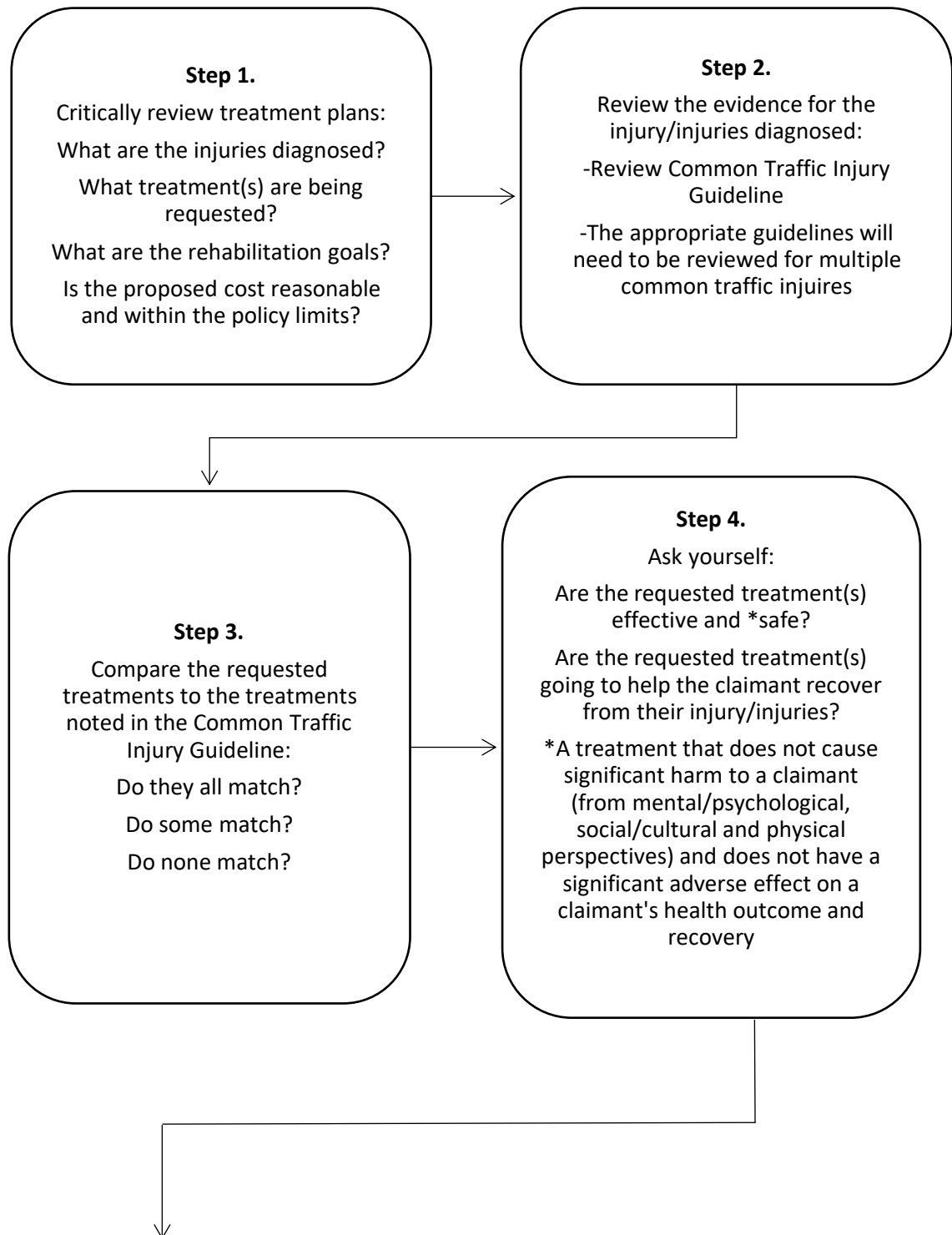
Effective communication is the vehicle that brings together the four components of evidence-based claims adjudication. Effective communication is the process of conveying information, thoughts and feelings in a way that is clearly understood, via speech or other means<sup>29</sup>; listening with understanding is considered the gateway to effective communication.<sup>30</sup> When concerns or disputes arise during the claims process, adjusters, clinicians, legal representatives and employers should use effective communication to share concerns with one another. Effective communication can create an environment

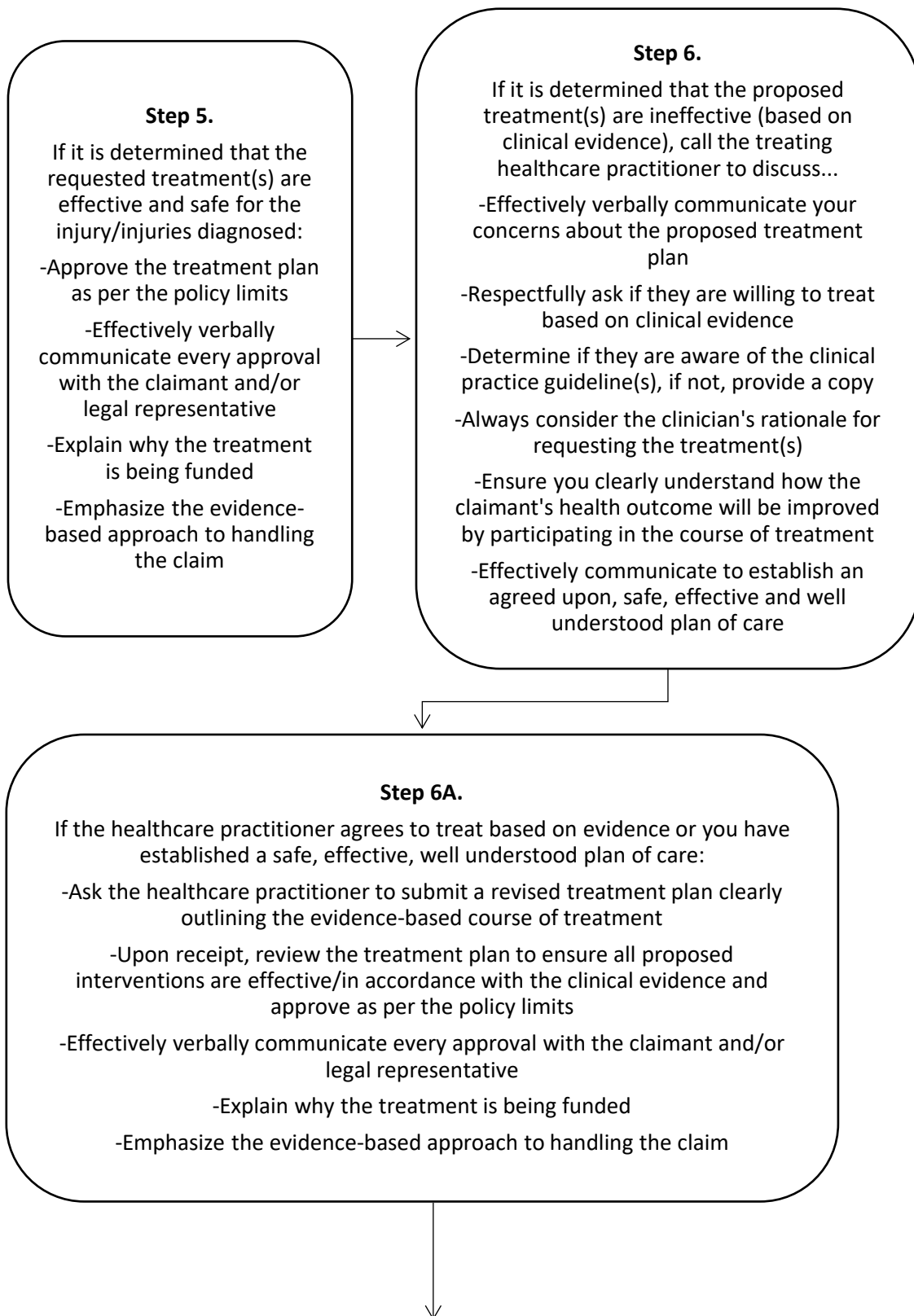
where all parties openly voice their concerns.<sup>31</sup> It is paramount to establish effective communication between adjusters and clinicians especially when disagreement occurs about the clinical care proposed by clinicians or expected by claimants. Specifically, adjusters must clearly understand the evidential basis for the proposed treatment. Adjusters and clinicians will need to engage in discussions surrounding the most appropriate interventions which are effective and safe for the claimant's recovery in order to establish an agreed upon, safe, effective and well understood plan of care.<sup>31</sup>

### **Steps for Making Evidence-based Claims Adjudication Decisions**

The critical steps required for claims adjusters to make evidence-based claims decisions are described in Figure 4. The first step is to critically appraise the proposed treatment plan for effectiveness and safety. The appropriateness of care must be confirmed through careful review of scientifically rigorous, trustworthy clinical evidence on their effectiveness and safety. A safe intervention is one that does not cause significant harm to a claimant (from mental/psychological, social/cultural and physical perspectives) and does not have a significant adverse effect on a claimant's health outcome and recovery.<sup>32,33</sup>

Figure 4. Steps for Making Evidence-based Claims Adjudication Decisions when Reviewing Treatment Plans





**Step 6B.**

If the healthcare provider does not wish to treat based on evidence or wishes to partially treat based on evidence and does not provide a rationale supported by clinically/scientifically relevant evidence which clearly explains how the claimant's health outcome will be improved...

- Deny the treatment plan and proceed to an insurer's examination with a physician to review

**OR**

- Partially approve the treatment plan for the evidence-based treatments and proceed to an insurer's examination with a physician to review the non-evidence-based treatments

**Medical Reason:** Based on the Common Traffic Injury Guideline, the proposed treatment(s) appear to be ineffective for treating the accident related injuries and may not be beneficial to the claimant's recovery, therefore the insurer is requesting a second medical opinion with a physician

- Effectively verbally communicate every denial/partial approval with the claimant and/or legal representative
- Explain why the treatment is not being funded entirely or why some of the treatments are being funded and others not
- Emphasize the evidence-based approach to handling the claim

An individual's ability to self-reflect on one's self, behaviour and actions is a fundamental component of self-awareness.<sup>34</sup> Adjusters should engage in self-reflection to help ensure that they are consistently adjudicating claims using the evidence-based claims adjudication framework. A table outlining some guided self-reflection questions associated with each of the four components in the evidence-based claims adjudication model is shown in Table 1. The questions were developed to help adjusters self-reflect and become aware of the level of accuracy with which the framework is being used to adjudicate injury claims.

Table 1. Evidence-based Claims Adjudication Guided Questions for Adjuster Self-Reflection

<b>Claimants' Values</b>	<b>Adjuster Expertise &amp; Judgement</b>	<b>Clinicians' Expertise</b>	<b>Use of Current Best Clinical Evidence</b>
<p>Have I inquired about claimant values (beliefs, expectations, experiences and opinions etc.)?</p> <p>Has the claimant expressed any values which are important to them?</p> <p>-Have I listened, considered and addressed the values important to the claimant?</p>	<p>Are the decisions I make going to benefit the claimant and help them to recover from their injury/injuries?</p>	<p>Do I have any concerns about a proposed treatment plan, and do I have all relevant information to make an informed claims decision?</p> <p>-If not, have I called healthcare provider(s) to effectively communicate any concerns and obtain any relevant information?</p> <p>Has the healthcare provider provided a rationale for proposing the treatment?</p>	<p>Have I used clinical evidence to make evidence-based claims decisions?</p>

		<p>-Do I clearly understand the healthcare provider's rationale and how the claimant's health outcome will be improved?</p> <p>-Was the rationale supported by scientifically rigorous, trustworthy clinical evidence on effectiveness and safety?</p> <p>-Have I listened and considered the healthcare provider's rationale?</p>	
<p>Am I effectively communicating with the claimant in a non-judgmental and non-biased manner?</p> <p>-Tone of voice, choice of words etc.</p>	<p>Am I gaining adequate claims knowledge and experience by handling different complexity of claims to enable me to improve my communication skills and become proficient at making claims decisions?</p>	<p>Am I monitoring the treatments rendered?</p> <p>-Are the treatments I am funding facilitating recovery?</p> <p>-If not, am I engaging in meaningful and effective discussion with the treating healthcare provider(s)?</p>	<p>Have I effectively educated the claimant on effective versus ineffective treatment?</p> <p>-Does the claimant understand what this means to their recovery?</p>

Am I being empathetic towards the claimant?		Have I called the healthcare provider(s) to discuss the claimant's progress?  -Am I proactively checking in?	Have I encouraged the claimant to engage in meaningful discussion with the treating healthcare provider(s) about the most clinically effective treatment options for their injury/injuries?
Am I regularly checking in with the claimant to make sure they are okay and to identify any barriers or challenges early on?			Have I effectively verbally communicated every approval, partial approval or denied treatment plan to claimant and/or legal representative?  -Do they understand why the claims decision was made?

### **Claimant-centered Care**

Claimant-centered care implies that adjusters should always put the claimant at the forefront and all claims decisions should be in the best interest of the injured claimant. Evidence-based claims adjudication needs to be delivered through a claimant-centered care approach. Claimant-centered care is an approach that focuses on the claimant and their claims care following a collision.<sup>35</sup> Claimant-centered care takes on a similar meaning



to patient-centered care, such that care should be respectful and responsive to each individual's needs and values.<sup>35</sup> Claimant-centered care requires a claims adjuster to share the decision-making process with healthcare providers and legal representatives and employers when applicable. Claimant-centered care also requires an adjuster to use a holistic approach and consider the “whole” claimant (person). Hence, following a collision a claimant's mental/psychological, social/cultural and physical state needs to be considered.<sup>36</sup> Inadequate consideration of individuals' thoughts, emotions, cultures, opinions, and attitudes and their distinct effects on the rehabilitation process may negatively impact recovery, happiness and satisfaction.<sup>37,38</sup>

### **Use of Evidence-based Claims Adjudication**

Evidence-based claims adjudication requires adjusters to effectively educate claimants about effective and ineffective therapeutic interventions and how they can facilitate or hinder recovery. This dialogue should begin at the inception of the claim and carry forward upon every submission of a treatment plan. Thereafter, adjusters should encourage claimants to engage in meaningful discussion with their healthcare practitioner(s) about the most effective clinical management. This will ensure that claimants have a good understanding of how participating in the rehabilitation program is going to get them back to their pre-collision health status. These discussions should promote claimant awareness.

### **Conclusion**

We proposed a framework for evidence-based claims adjudication by adapting the evidence-based medicine model. Utilizing the evidence-based claims adjudication framework may help to improve the health outcomes of claimants and may result in faster claim closures and reduced claims costs. Further research is warranted to determine the effectiveness and implementation of the model.

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**CHAPTER 4: DEVELOPMENT AND EVALUATION OF A TECHNOLOGY-BASED LEARNING  
TOOL FOR THE EVIDENCE-BASED CLAIMS ADJUDICATION OF ONTARIO COMMON  
TRAFFIC INJURY CLAIMS**

## **Abstract**

### *Introduction*

In Ontario, persons injured in traffic collisions receive healthcare from clinicians of their choice, but funding for care must be approved by an injury claims adjuster. Little is known about the decision-making process used by adjusters to approve or deny funding. Although relevant, it is unlikely that evidence on the effectiveness and safety of clinical interventions informs claims decisions because adjusters are not trained within an evidence-based claims adjudication model.

### *Objective*

I aimed to develop and evaluate the learning, design, and engagement constructs of a technology-based learning (TBL) tool designed to train insurance claims adjusters in making evidence-based claims adjudication decisions for the management of common traffic injuries.

### *Study Design*

I conducted a qualitative case study and consultation sessions with claims staff at Aviva Canada in addition to a cross-sectional study to evaluate the learning, design, and engagement constructs of the TBL tool.

### *Method*

I developed the TBL tool by drawing upon pedagogy, instructional design and an advisory committee of claims adjusters and managers. The tool focused on a clinical practice guideline for the management of neck pain. Optional quizzes gave learners the opportunity to self-assess their knowledge. I evaluated the tool in a sample of Aviva Canada adjusters between May and September 2019. Adjusters were invited to participate during work hours and received a time-release or on their own time. The tool

was evaluated using the Learning Object Evaluation Scale for Students (LOES-S), which assesses the quality of TBL tools and its impact on students' ability to learn.

### *Result*

Observation and consultation with Aviva claims staff facilitated the creation of a self-directed, self-paced, asynchronous, module-based online curriculum. I invited 110 adjusters to participate in using the tool and 37 (33.6%) consented. Of those, 26 completed all training modules (74.3%). Sixteen (61.5%) participants evaluated the tool with the LOES-S upon completing the modules. Most participants were female (75.0%) and aged between 23-29 years (62.5%). All participants completed the training outside of office working hours. All LOES-S items received favorable ratings (median  $\geq 4.0/5.0$ ), except for "the graphics and animations from the tool helped me learn" (median = 3.5/5.0). These scores indicate that most adjusters agreed with the learning, design and engagement constructs of the tool.

### *Conclusion*

My evaluation suggests that the TBL tool has sound pedagogical and instructional design properties. All but one LOES-S items (12/13) were rated 4.0/5.0 or higher. The results support the development of a research program to evaluate whether the tool can improve adjusters knowledge of practice guideline treatment recommendations.

## Introduction

Insurance claims adjusters approve or deny funding for clinical interventions submitted by healthcare providers for the clinical management of traffic injuries.<sup>1</sup> Currently, they make funding decisions without considering the best evidence on the effectiveness and safety of clinical treatments. Generally, adjusters lack medical and rehabilitation knowledge about the treatment recommendations made in practice guidelines.

In 2012, the Ontario government mandated the development of evidence-based care pathways to improve the clinical management of individuals injured in motor vehicle collisions.<sup>2</sup> The government publicly released the Common Traffic Injury protocols in 2015.<sup>2,3</sup> An independent review of the Ontario automobile insurance system later recommended that the insurance industry adopt the care pathways to facilitate improving the health outcomes of individuals injured in traffic collisions.<sup>4</sup> This recommendation was significant for insurers because it suggested that claims adjusters would need to become knowledgeable of evidence-based practice.<sup>5</sup> However, insurers currently lack learning tools to teach adjusters about evidence-based practice.

To my knowledge, there is no evidence-based framework specifically designed for automobile insurance claims adjudication. Therefore, I developed the evidence-based claims adjudication framework for insurers by adapting Sackett's evidence-based medicine framework.<sup>6</sup> I adapted the principles and made them relevant and meaningful for claims adjusters. I hypothesized that evidence-based claims decisions would improve the health outcomes of persons injured in collisions because it enables adjusters to: 1) critically appraise the value of clinical interventions proposed by clinicians;<sup>5</sup> 2) engage in informed and meaningful discussions with clinicians about the effectiveness and safety of treatments;<sup>5</sup> and 3) discuss the appropriateness of treatment options with clinicians and claimants.<sup>5,7</sup>

Transferring knowledge about the newly developed evidence-based claims adjudication framework is complex. Training methods used in the insurance industry still rely on the traditional in-class method.<sup>8</sup> However, the emergence of educational technologies and



methods suggest that a shift from classroom to online learning is needed.<sup>8</sup> Online learning offers flexibility by allowing learners to be trained at any time, from anywhere, on any device and may reduce lost time and improve productivity.<sup>9</sup> Moreover, technology-based learning (TBL) tools that have considered pedagogy and instructional design can provide consistency of education and can help to improve employee satisfaction and learning.<sup>8,10</sup> However, little is known about the effectiveness of TBL tools to improve knowledge of practice guidelines by claims adjusters.<sup>11</sup>

Therefore, I aimed to 1) develop a technology-based learning (TBL) tool designed to train insurance claims adjusters in making evidence-based claims adjudication decisions for the management of common traffic injuries using qualitative methods, pedagogy and instructional design principles, and 2) evaluate the learning, design, and engagement constructs of the TBL tool in a sample of Aviva claims adjusters using the Learning Object Evaluation Scale for Students (LOES-S).<sup>12</sup>

## **Methods: Objective 1- Development of the Technology-based Learning Tool**

### **Procedures**

I developed the TBL tool in four sequential phases: 1) observation of Aviva claims adjusters to understand their decision-making process when adjudicating claims; 2) consultation on the development of the TBL tool with an advisory committee of claims adjusters, managers and the claims learning and development team (this team designs, develops, implements and manages all learning initiatives at Aviva); 3) inclusion of knowledge gained in phases 1 and 2 in addition to pedagogical and instructional design decision-making and; 4) development of a storyboard to draft the tool.

The clinical content of the TBL tool was based on the Common Traffic Injury Guideline for the management of recent onset (0-3 months post-collision) Neck Pain and Its Associated Disorders, grades 1 and 2.<sup>3</sup> I focused on neck pain because it is the most common traffic injury.<sup>13</sup>

## **Phase 1: Observation of Aviva Claims Adjusters**

### *Study Design*

I conducted a qualitative case study of the Aviva Canada Healthcare Services department in Markham, Ontario, Canada.

### *Site Visits*

Aviva Canada is a large property and casualty insurer. I visited the Aviva Canada head office on four occasions (April 6, 19, 25, 2017 and May 5, 2017) to facilitate my understanding of the claims decision-making process, the work environment, adjuster roles and responsibilities and adjuster learning needs and preferences.

During these visits, I spoke to adjusters, I listened to adjusters' telephone conversations with claimants; I listened to their discussions and observed their interactions with front-line and clinical managers (during file reviews). I also discussed roles and responsibilities with managers; and I spoke with the *Systems Thinking* lead who advised me about the *Systems Thinking* methodology employed by Aviva.<sup>14</sup> *Systems Thinking* is an approach that places greater emphasis on providing great customer service.<sup>14</sup> *Systems Thinking* enables adjusters to focus on the values that matter most to claimants and removing work that is not of value to claimants.<sup>14</sup>

### *Analysis*

I recorded my observations as free-form written notes and subsequently transferred them to a word document. I independently conducted an inductive thematic analysis. Eight themes emerged from the transcript *a posteriori* (good customer experience, busy adjusters with heavy workloads, cost over care, Google search, avoiding multiple touches, front-line managers are mentors, clinicians' expertise and evidence-based practice). I analyzed the data from an interpretivist-constructivist philosophical perspective which relies on the participants' views and experiences and the social context being studied.<sup>15</sup> Hence, I developed the themes through the eyes of the participants and their experiences

within their social context. No qualitative data analysis software was used during the thematic analysis.

## **Phase 2: Consultation with Aviva Claims Advisory Committee, Managers and Claims Learning and Development**

### *Study Design*

I consulted with members of the Aviva advisory committee in Markham, Ontario, Canada. I documented their preferences for online learning and organized their responses into themes to inform the design of the learning tool.

### *Advisory Committee Formation and Consultation*

With the support of Aviva's vice-president of Healthcare Services, I created a claims advisory committee to inform the development of the tool. The committee was tasked with identifying staff preferences for online learning. The committee included the vice-president, eight adjusters and three front-line managers who had varying levels of experience and skills. I consulted the committee on two occasions (September 28, 2017 and October 5, 2017).

### *Analysis*

The meetings were audio recorded and I took free-form hand-written notes. All notes were transcribed to a word document. I independently conducted an inductive thematic analysis. All themes emerged from the transcript *a posteriori*. I developed the themes based on instructional design principles and pedagogical theories. I grouped similar comments together to create 12 themes (personalization, coherence, andragogy, simple and intuitive use, multimedia, flexible use, practice, equitable use, perceptible information and learner control principles in addition to ARCS [attention, relevance, confidence and satisfaction] model of motivation and constructivism). No qualitative data analysis software was used during the thematic analysis.

I asked the following questions during the meetings:

- 1) What is most important to you when accessing online learning material?
- 2) When you are accessing information online do you prefer to read or view a video when concepts or ideas are illustrated?
- 3) Do you prefer formal versus informal language for text?
- 4) What facilitates remembering information online?
- 5) What are the perceived incentives and barriers for online learning participation?
- 6) If you have taken an online course in the past, did you find it burdensome to complete?
- 7) In what job related situations would you apply (or want adjusters to apply) the knowledge obtained from the learning tool?

Throughout the tool's development phase, I worked with a consultant from the claims learning and development team to assist with the adaptation of the curriculum to Aviva's e-Learn software. Finally, I worked with two claims managers who are licensed clinicians to ensure that the learning content was appropriate for the learners. The content (modules, case study, instructional videos, and quizzes) of the tool was reviewed and approved by these two managers.

### **Phase 3: Pedagogical and Instructional Design Decision-making**

I developed the TBL tool using pedagogy, multimedia learning principles, and universal instructional design principles. Pedagogy refers to the practice of teaching and what instructors do to enhance learning in others, it also refers to the learning theories and their philosophical perspectives that are drawn upon to guide the development of curriculum.<sup>16</sup> Instructional design refers to the specific principles drawn upon during the "design" phase which help facilitate learning and achieving the learning objectives.<sup>17</sup> For the purpose of my research, pedagogy and instructional design are considered distinct, yet interconnected.

Multimedia learning principles are used to facilitate and maximize effective online learning.<sup>18</sup> Universal instructional design principles promote inclusive instruction, which benefits a vast array of learners, including learners with disabilities.<sup>19,20,21</sup> I developed the tool on the premise of adult learning theory and principles of andragogy; taking the fundamental perspective that corporate adult learners are capable of autonomous self-directed learning.<sup>22-25</sup> I drew upon other pedagogical perspectives to develop the online curriculum.

The following learning theories were considered in the development of the TBL tool:

- 1) Adult learning theory and andragogy principles;<sup>22-25</sup>
- 2) ARCS model of motivation;<sup>26,27</sup>
- 3) Problem-based learning;<sup>28</sup>
- 4) Constructivism;<sup>29,30</sup>
- 5) Activity theory;<sup>31,32</sup> and
- 6) Connectivism.<sup>33,34</sup>

Appendix B provides a detailed description of the learning theories, multimedia learning principles and universal instructional design principles and how I used them to develop the tool.

Optional assessments of knowledge (in the form of self-assessment quizzes) were included in the TBL tool to promote learner autonomy and put learners in full control of their learning.<sup>22-25, 31,32</sup> The purpose of including short knowledge quizzes at the end of lessons was to promote learner motivation and active participation in an asynchronous, self-directed online learning situation, where learners engage and interact with the learning content by participating in the voluntary knowledge assessments.<sup>18,26,27,31,32</sup> The quizzes also gave learners the opportunity to self-assess their knowledge of the subject matter and depth of understanding of the learning content prior to progressing to the next lesson. The tool included 33 multiple choice and true/false questions. Learners were allowed to attempt answering questions as many times as needed. The questions were built to directly reflect the learning content contained in each module. Following

completion of the 13 modules, the last section of the tool contained one case study, which provided a realistic claims scenario and treatment plan request. The aim was for learners to think about and apply the concepts learnt in the modules to help make an evidence-based claim decision surrounding the hypothetical treatment plan request.<sup>28</sup> The case study quiz required comprehension and application of acquired knowledge.

From an instructional design perspective, the quizzes provided learners with immediate feedback of where they went wrong and reinforced the correct answers.<sup>18</sup> Allowing multiple attempts provided learners with the opportunity to go back and try again when a question was not correctly answered.<sup>9</sup> This process allows learners to self-reflect on what they understand, what they do not understand, and what they may need to spend more time focusing on by going back and reviewing material or asking questions through the discussion boards. Permitting multiple attempts also gives learners the opportunity to “practice” newly acquired knowledge by engaging with the quizzes.<sup>18</sup>

Discussion boards were created for each module and case study to allow learners to post questions and comments about the learning content and to obtain instructor feedback.<sup>19,20,21,33,34</sup> I was responsible for reviewing and answering any questions or comments requiring clarification.

#### *Presentation Features of Written Text, Video and Audio Narration*

Based on input received from the Aviva advisory committee, it was decided that written text, video and audio voice-over would be integrated into the learning tool to offer variety in the presentation of the learning content. Text on-screen was presented as either bullet point notes and/or short sentences and were used to present facts. Text alone on-screen was used when an appropriate accompanying graphic could not be found, could not be created and could not be integrated into the instruction effectively to maximize effective online learning.<sup>18</sup> Instructional videos were created and used to introduce adjusters to brand new concepts such as “evidence-based claims adjudication” and “claimant-centered care.”<sup>18</sup> The only other instance where videos were integrated into the tool was in relation to unsupervised range of motion exercises. Videos were provided to allow

learners to explore and visually enhance their understanding of the anatomical movements of the different range of motion exercises used in clinical practice. Audio voiceover was used sparingly to reinforce an important point, was expressed in one short sentence and was presented without the use of an accompanying visual.<sup>18</sup> Voiceovers were also used in conjunction with relevant graphics to explain new materials and were presented as on-screen text such as the Venn diagram for evidence-based medicine.<sup>18</sup> This approach was used because the graphic was the focus of the words and both were presented simultaneously.<sup>18</sup> Finally, the tool was created using the system defaults for font, font colour and font weights.

#### **Phase 4: Storyboarding**

Storyboarding is a technique used to visually organize the layout of online curriculum. I used this technique to document the visual, text and audio elements of the tool and to define user interactions and branching.<sup>35</sup> The storyboard layout was then transferred to the Canvas Learning Management System (LMS).<sup>36</sup> Canvas LMS is an open LMS that is accessible from computers, mobile devices and other computing devices.<sup>36</sup>

#### **Creation and Presentation of the Technology-based Learning Tool**

The TBL tool was designed as a self-directed, self-paced, asynchronous curriculum with short modules. The tool introduced participants to evidence-based claims adjudication and trained them on the evidence-based management of Neck Pain and Its Associated Disorders (0-3 months post collision).<sup>3,5</sup> I created and built the layout for all module and case study content and published the course on Canvas LMS (Figure 5). All content was adapted to Aviva's Elucidat e-Learn software and published to Aviva's Grow LMS (Figure 6). Only Aviva employees can access the LMS using their employee identification and password and all employees must be manually enrolled to access online learning material. The curriculum was adapted to Aviva's LMS to eliminate any barriers related to having the technical skills to participate in online learning such as unfamiliarity with the platform, inability to navigate through the digital platform with comfort and inadequate access to

technological learner support services to address any technical issues with the platform. A designated person from the Aviva claims learning and development team was available to assist with any encountered technical difficulties.

Figure 5. Screenshot of the Curriculum Homepage in Canvas

**EBCA/NAD (0-3 Months Post MVC)**

[View Course Stream](#)  
[View Course Calendar](#)

**To Do**  
Nothing for now

Welcome to Evidence-based Claims Adjudication & The Evidence-based Management of Neck Pain (0-3 Months Post Collision)

**Course Description**

This self-directed online course has been designed for you! This course aims to introduce you to the concept of evidence-based claims adjudication and provide you with training on the evidence-based management of neck pain and its associated disorders, grades 1&2 (0-3 months post collision). This introductory course focuses on the ways in which an evidence-based claims adjudication approach can be integrated into your role as an Aviva Canada Healthcare Services advisor.

Figure 6. Screenshot of the Aviva Curriculum Adaptation

**UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY**

**AVIVA**

**Evidence-based Claims Adjudication and The Evidence-based Management of Neck Pain (0-3 Months Post Collision)**

**Module 1: Evidence**

This self-directed online course has been designed for you! This course aims to introduce you to the concept of evidence-based claims adjudication and provide you with training on the evidence-based management of neck pain and its associated disorders Grades 1 & 2 (0-3 months post collision). This introductory course focuses on the ways in which an evidence-based claims adjudication approach can be integrated into your role as an Aviva Canada Healthcare Services advisor.

[Let's Go >](#)



## Learning Tool Content and Structure

The TBL tool included 13 modules (Table 2). Each module included learning goals, instructions, description of the learning content, a module summary, a knowledge quiz and access to the discussion board. The first four modules provided pre-training of main concepts.<sup>18</sup> Module 1 introduced the concept of evidence, module 2 introduced evidence-based medicine, module 3 introduced evidence-based claims adjudication and module 4 introduced the learner to clinical practice guidelines. The remaining modules discussed the evidence-based management of recent onset neck pain. The tool concluded with a case study where learners were expected to apply the concepts learnt in the modules.

Table 2. Learning Tool Modules and Number of Quiz Questions Contained in Each Module

Module #	Topic	# Quiz Questions
1	Evidence (Pre-training)	2
2	Evidence-based Medicine (Pre-training)	2
3	Evidence-based Claims Adjudication (Pre-training)	5
4	Clinical Practice Guidelines (Pre-training)	2
5	Neck Pain and Its Associated Disorders (0-3 months post collision)	2
6	Neck Pain and Its Associated Disorders and Other Associated Symptoms	2
7	Aims of the Neck Pain and Its Associated Disorders Guideline and Care Pathway	4
8	Structured Patient Education	1
9	Unsupervised Range of Motion Exercises	2
10	Multimodal Care	2
11	Muscle Relaxants	2
12	Do Not Offer Treatments for Neck Pain and Its Associated Disorders	2
13	Claimant's Not Recovered?	0
	Case-study	5

## **Methods: Objective 2- Evaluation of the Technology-based Learning Tool**

### *Study Design*

I conducted a learner-centered evaluation of the tool in a sample of Aviva Canada Healthcare Services adjusters. This research study was reviewed and approved by the University of Ontario Institute of Technology (Ontario Tech University) Research Ethics Board on April 2, 2019 (REB# 15254).

### *Study Population*

Eligible to participate were full-time or part-time adjusters (handling Accident Benefits claims) at Aviva claims offices located in Markham and Oakville, Ontario between May 21, 2019 to September 26, 2019 (n=110). Employees involved in the development of the learning tool and any other persons who helped to inform the development of the tool were not eligible to participate. All participants provided informed consent via online Google Forms.

### *Recruitment*

I used four strategies to recruit participants. First, the vice-president of Aviva Healthcare Services sent an email invite to Markham and Oakville claims teams announcing the study (Appendix C) and sent reminder emails throughout the enrollment period. The email included a letter providing information about the study (Appendix D) and link to the informed consent form (Appendix E) and baseline questionnaire (Appendix F). The second strategy involved front-line managers who introduced the study to teams of adjusters during team meetings using a standard script (Appendix G). Third, front-line managers emailed teams a one-paged flyer (Appendix H) and link to a YouTube video. The video provided a brief overview and purpose of the research study (Appendix I). Finally, reminder emails were regularly emailed to staff by the vice-president and front-line managers reminded teams of the study during team meetings. All front-line managers were provided with a scripted document outlining possible questions and answers they

might receive from potential participants (Appendix J). Standardized scripting was used to ensure that a consistent message was being conveyed to potential participants by managers.

### *Data Collection*

After providing consent, participants were asked to complete the baseline questionnaire which collected demographic and work-related data. An email notification was sent to consenting participants with instructions on how to access the Aviva learning portal. Participants were advised to progress through the TBL tool at their own pace. Flexible learning enables learners to receive training at any time, from anywhere, on any device.<sup>9</sup> Participants had the option to complete the curriculum during working hours, where they received a work time-release or from home. Participants initially had a maximum of two weeks to complete the curriculum and evaluation from the day of enrollment. However, due to heavy workloads the maximum time to complete the curriculum and evaluation was extended to four weeks.

Once self-directed learning was completed, participants were asked to evaluate the learning, design, and engagement constructs of the TBL tool by completing the Learning Object Evaluation Scale for Students (LOES-S).<sup>12</sup> Finally, participants were invited to answer an open-ended question and provide additional feedback about the tool.

### *Baseline Questionnaire*

Participants were prompted to complete an electronic baseline questionnaire (Appendix F) to collect the following information:

- 1) Age;
- 2) Gender;
- 3) Duration of employment at Aviva Canada;
- 4) Experience in the automobile insurance industry;
- 5) Experience handling Accident Benefits claims;
- 6) Highest level of education completed;

- 7) Certified Insurance Professional (CIP) designation;
- 8) Knowledge of the evidence-based clinical practice guideline for Neck Pain and Its Associated Disorders;
- 9) Previous use of evidence-based clinical practice guidelines to make decisions about treatment requests;
- 10) Previous experience with technology-based learning tools; and
- 11) Proficiency with computers.

#### *Learning Object Evaluation Scale for Students*

Following completion of the modules and case study, participants were asked to evaluate the tool using the Learning Object Evaluation Scale for Students (LOES-S)<sup>12</sup> (Appendix K). The scale measures three constructs (learning, design and engagement) by asking 13 questions, which participants rate using a 5-point Likert scale.<sup>12</sup> The LOES-S was used because it assesses the tool's quality and its impact on students' ability to learn.<sup>12</sup> Two studies evaluated the psychometric properties of the LOES-S.<sup>12,37</sup> Both studies included middle and secondary school students between the ages of 10-22 years.<sup>12,37</sup> The second research trial measured internal reliability in addition to construct, convergent and predictive validity; all were found to have acceptable levels of validity.<sup>12</sup> Internal reliability was evaluated using Cronbach's  $\alpha$  for the tool's three constructs: learning ( $\alpha=0.93$ ), design ( $\alpha=0.87$ ), and engagement ( $\alpha=0.92$ ).<sup>12</sup> It was determined that the Cronbach's  $\alpha$  values demonstrated adequate internal reliability.<sup>12</sup>

Construct validity was assessed to determine if the learning tool constructs were distinct factors in learning.<sup>12</sup> It was determined that learning, design and engagement were inter-related (0.63-0.74) but small enough shared variances of 42% to 56% also made them distinct constructs.<sup>12</sup> Although distinct, the constructs likely interact and influence one another during the learning process.<sup>12</sup>

Convergent validity was evaluated to measure if the learning tool constructs were related to teacher ratings and computer and subject area comfort level.<sup>12</sup> A moderate relationship was found between student and teacher ratings of the learning, design and engagement constructs (0.36 to 0.65).<sup>12</sup> Students who were more comfortable using computers and comfortable with the learning material rated the constructs more favorably.<sup>12</sup>

Predictive validity was measured to determine whether the learning tool evaluations correctly predict remembering, understanding, application, and analysis.<sup>12</sup> The learning, design, and engagement constructs were significantly associated with knowledge increases in application (0.16, 0.12, 0.16) and analysis (0.37, 0.30, 0.31) of knowledge, but not associated with remembering or understanding.<sup>12</sup>

### **Study Amendment**

I initially planned to close data collection on August 31, 2019. Inspection of the data in September 2019 indicated that 35 participants were enrolled. Of those, 26 completed all modules and case study, one did not complete all modules, and eight participants did not complete any of the modules by the study's closing date. However, only nine of the 26 participants who completed all training had evaluated the tool using the LOES-S.

I investigated reasons for the low rate of completion of the LOES-S and that this may have been due to unclear survey instructions. Specifically, the sequence of instructions thanked participants for completing the study before they were asked to evaluate the tool. Therefore, some participants may have omitted to complete the evaluation.

As a remedial step, a reminder email was sent to all participants (n=35) and invited them to complete the curriculum (if not previously completed) and to evaluate the TBL tool. Two additional weeks were provided to participants to complete the curriculum and evaluate the tool. Seven additional participants completed the evaluation using LOES-S during the study extension.

This methodological amendment was reviewed and approved by the University of Ontario Institute of Technology (Ontario Tech University) Research Ethics Board on September 12, 2019 (REB# 15254).

## **Analysis**

### *Quantitative Component (LOES-S and Quiz Results)*

Descriptive statistics (medians (interquartile range) and frequencies (percentages)) were computed using SPSS Statistics, version 26.<sup>38</sup> A score of 4.0-5.0/5.0 (agree or strongly agree) was classified as a favourable evaluation on the 5-point Likert scale, a score of 1.0-2.0/5.0 (strongly disagree or disagree) was classified as unfavorable and a score of 3.0/5.0 was classified as neutral. Due to the non-normal distribution of data and the nature of the LOES-S scores, I used the median and interquartile range (IQR) to describe the evaluation of each of the 13 items. For the purpose of analysis, the evaluations of LOES-S items were categorized into agree, neutral and disagree. A median score of 4.0-5.0/5.0 indicated that the response was favorable. I decided that any item with a median score <4.0/5.0 indicates room for improvement. Descriptive statistics (frequencies (percentages)) were also used to describe the quiz responses.

### *Qualitative Component (Open-ended Question)*

I conducted an inductive thematic analysis *a posteriori*. I analyzed the open-ended question independently and developed themes based on instructional design principles and pedagogical theories. I grouped similar comments to create three distinct comments. Five themes from pedagogical (ARCS model of motivation and constructivism) and instructional design (andragogy principles, flexible use and multimedia principle) perspectives were identified. No qualitative data analysis software was used during the thematic analysis.

## Results

### Objective 1: Development of the Technology-based Learning Tool

#### Phase 1: Observation of Aviva Claims Adjusters

Eight themes were identified. The observations and themes are synthesized in Table 3.

Non verbatim responses from claims staff are indicated in italics.

Table 3. Aviva Field Observations and Themes

Aviva Field Observation	Theme
<i>Systems Thinking</i> is a central focus in the claims department. <sup>14</sup> I observed that adjusters' goal is to assist claimants to return to pre-collision health status. <i>Systems Thinking</i> assists adjusters to achieve this goal by simplifying some of the claims processes. For example, waiving certain regulated claims forms makes the process easier for claimants. Adjusters take "ownership" of their claims and have the autonomy to make their own claims decisions. Healthcare Services adjusters indicated that <i>adjusters want to provide a good customer experience for all claims.</i>	Good customer experience
I observed that adjusters have very heavy workloads and high jobs demands. They are expected to work at a fast pace and meet stringent timelines set out by the Statutory Accident Benefits Schedule. Adjusters indicated that they have to perform all tasks related to the claim such as paying for invoices and arranging insurer examinations etc. Adjusters indicated that <i>it takes a long time to do everything (all the elements involved in claims adjudication) and adjusters have to do everything.</i>	Busy adjusters with heavy workloads
Adjusters prioritize cost over healthcare. I observed during initial calls with claimants, adjusters collect few details about injuries. Discussions focus on insurance policy "dollar" limits and specified benefits. Adjusters do not educate injured claimants about the importance of receiving effective clinical care to facilitate recovery.	Cost over care

<i>There is no standard way on how the initial call should be completed.</i>	
I observed adjusters searching Google for medical information. For example, some adjusters search for information about injuries to understand the nature and extent of the injury/injuries that they will be adjudicating (e.g. <i>is the injury one that requires hospitalization? Just to know what to expect</i> ).	Google search
The department tries to avoid file transfers. There is very little movement of claims from one adjuster to another. I was advised that <i>re-assignment of claims is not common</i> .	Avoiding multiple touches
Front-line managers teach adjusters about procedures necessary to adjudicate claims. They conduct file reviews with adjusters at their desk, answer their questions and provide feedback. One manager indicated <i>the manager's role is to sit with the adjuster (to mentor them)</i> .	Front-line managers are mentors
Managers with clinical expertise (e.g. chiropractors, physiotherapists) provide clinical information to adjusters and educate them about clinical topics to help increase their knowledge. All training is done in-class. One clinician indicated that the challenge with training adjusters is <i>time, clinical knowledge (lack of it) and uniqueness (no two claims are the same)</i> .	Clinicians' expertise
<p>I observed that adjusters do not have adequate medical and rehabilitation knowledge to make evidence-based claims decisions. The traditional insurance model, which is focused on actuarial, regulation-based claims decision-making does not facilitate the use of best scientific evidence.<sup>1,5</sup></p> <p>Aviva claims managers and vice-president confirmed that adjusters are <i>not trained on evidence-based practice or how to use clinical evidence to make claims decisions</i>. A framework for evidence-based claims adjudication does not currently exist in Ontario and the Statutory Accident Benefits Schedule does not mandate using evidence when adjudicating injury claims.<sup>1,5</sup></p>	Evidence-based practice



## Phase 2: Consultation with the Aviva Advisory Committee

Adjusters and managers indicated that an online, asynchronous, self-directed, module-based curriculum is the preferred method to introduce evidence-based claims adjudication to adjusters. The advisory committee made the following recommendations for the development of the TBL tool. Twelve themes were identified (Table 4).

Table 4. Aviva Advisory Committee Preferences and Themes

Aviva Advisory Committee Preferences	Instructional Design or Pedagogical Theme
<p>The overall preference was to limit formal language unless necessary.</p> <ul style="list-style-type: none"><li>• “I prefer informal” (language).</li><li>• “Informal for sure, because how are we then going to understand, interpret it and then reiterate it to a claimant who has no idea...sometimes it’s nice when its broken down for us because we can then break that down for the claimant.”</li><li>• “If it’s specific topics that is a formal statement that we are analyzing then it obviously has to be there and then a break down with an informal explanation.”</li></ul>	Personalization Principle <sup>18</sup>
<p>The overall preference was to create modules that are simple, quick to complete and use point form notes to highlight key points.</p> <ul style="list-style-type: none"><li>• “I like just to the point, like not so long and point form I retain as opposed to longer sentences explaining the same thing.”</li><li>• “It’s nice to just look at the key points instead of reading a long paragraph, it takes less time.”</li><li>• “I don’t like enormous paragraphs, if you have to read too much, you’ll get lost or lose interest, so you know short and concise.”</li></ul>	Coherence Principle <sup>18</sup>

<ul style="list-style-type: none"> <li>• “Not busy, like each screen shouldn’t be too busy but still somewhat upbeat.”</li> </ul>	
<p>The overall preference was to develop content that is relevant to the job. The content contained within the tool should facilitate constructing knowledge that can be used in the everyday handling of claims.</p> <ul style="list-style-type: none"> <li>• “If we know a little bit more about like what types of therapy are beneficial for what types of injuries then we can have that conversation with them (claimants).”</li> <li>• “...because right at the onset when we’re speaking to the claimant if we have more knowledge, we can talk right at the beginning...explaining what we need to say, setting expectations.”</li> <li>• “To substantiate when, you know, they deny an unreasonable plan that doesn’t really follow the evidence-based, based on everything they have, they use that knowledge to be confident in, you know, talking to clinics and lawyers about what really is necessary.”</li> </ul>	<p>Andragogy Principles<sup>22-25</sup>  ARCS Model of Motivation<sup>26,27</sup>  Constructivism<sup>29,30</sup></p>
<p>The overall preference was to develop a tool that is easy to use and navigate.</p> <ul style="list-style-type: none"> <li>• “The number one thing that came to my mind was the flexibility of the application that I can toggle back and forth easily.”</li> <li>• “What I didn’t like was an overwhelming number of drop downs.”</li> </ul>	<p>Simple and Intuitive Use<sup>19,20,21</sup></p>
<p>The overall preference was to include both media and text in the tool.</p> <ul style="list-style-type: none"> <li>• “I prefer both” (media and text).</li> <li>• “I like reading.”</li> </ul>	<p>Multimedia Principle<sup>18</sup></p>

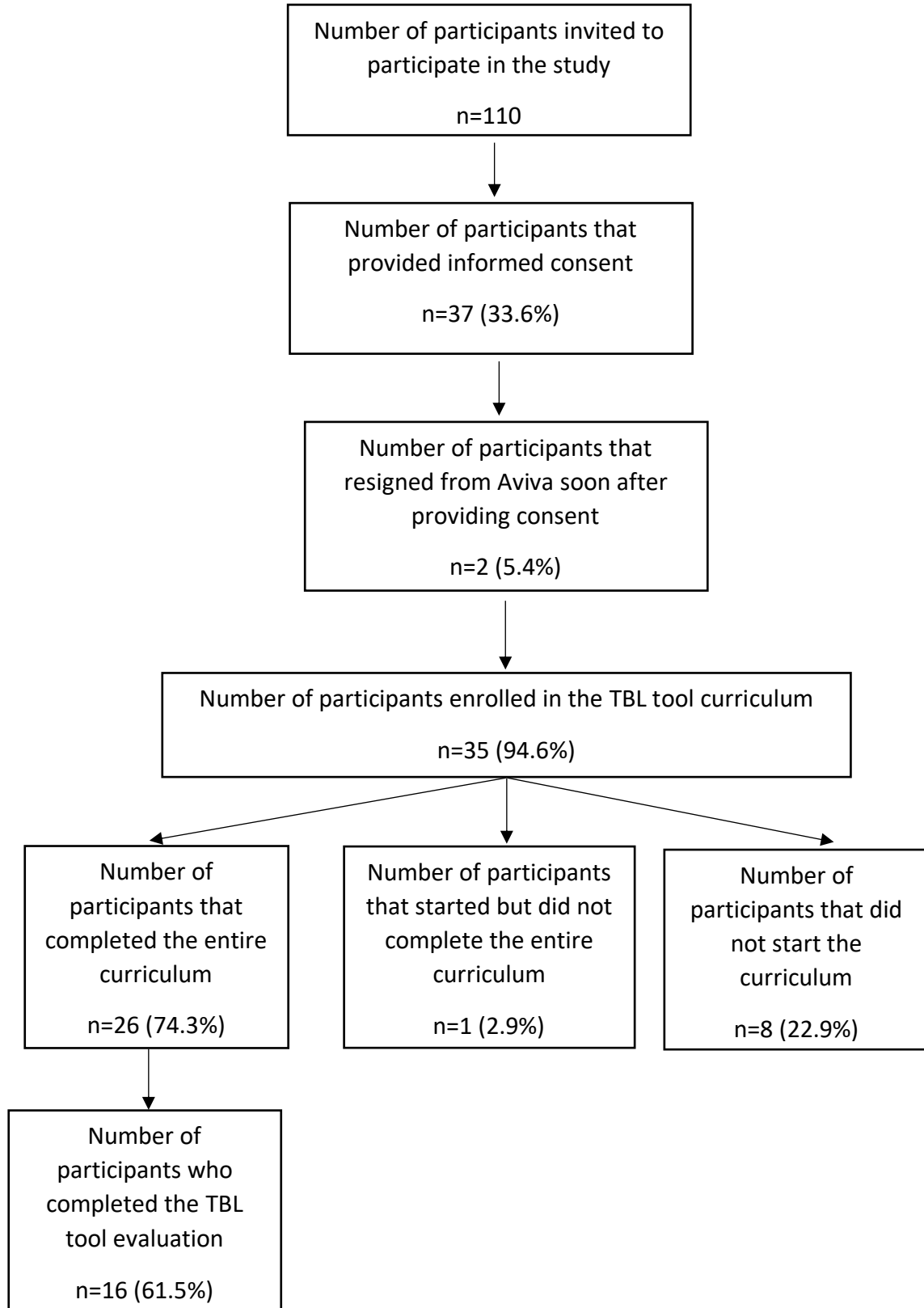
<ul style="list-style-type: none"> <li>• “I don’t mind videos too.”</li> <li>• “I like videos, I watch a lot so I’m very visual.”</li> <li>• “I like video, um, not too long because might lose the attention.”</li> </ul>	
<p>The overall preference was to use relevant visual aids (pictures, diagrams, flowcharts etc.) in the tool and the tool must be visually appealing, employing both graphics and imagery.</p> <ul style="list-style-type: none"> <li>• “I definitely like the graphics.”</li> <li>• “You need some imagery; it will attract attention.”</li> </ul>	<p>Multimedia Principle<sup>18</sup> Flexible Use<sup>19,20,21</sup></p>
<p>The overall preference was to develop a tool that is engaging and interactive.</p> <ul style="list-style-type: none"> <li>• “The most effective ones (online tools) are interactive.”</li> <li>• “A question at the end always seems to be beneficial (a self-assessment).”</li> </ul>	<p>Practice Principle<sup>18</sup></p>
<p>The overall preference was to create a tool that allows the learner to “refer back” to modules for information.</p> <ul style="list-style-type: none"> <li>• “We’ll pull on expertise (colleagues) but it would be nice to not have it be a person...a tool to refer back to saying this is what the treatments are and this is what patients get or should be getting.”</li> <li>• “I think refer back to is a such key term because then we don’t have to constantly pull on you (manager) or another form of expertise.”</li> <li>• “It should be an available tool for us like the SABS before we start bothering other people for help.”</li> </ul>	<p>Simple and Intuitive<sup>19,20,21</sup> Equitable Use<sup>20,21</sup> Flexible Use<sup>19,20,21</sup></p>
<p>The overall preference was flexible learning using the tool.</p>	<p>Equitable Use<sup>20,21</sup></p>

<ul style="list-style-type: none"> <li>• “I like the flexibility of doing the online as opposed to any other way of doing it, the paper, the book, textbook.”</li> <li>• “Sometimes I look at things outside business hours.”</li> <li>• “If you are able to do it (learning) at your leisure, then it doesn’t become a burden.”</li> </ul>	
<p>The overall preference was to create a tool that does not contain Times New Roman font (the preferred fonts are Arial or Calibri).</p> <ul style="list-style-type: none"> <li>• “No Times New Roman, I hate that font.”</li> <li>• “I like Calibri or Arial.”</li> </ul>	Perceptible Information <sup>20</sup>
<p>The overall preference was to develop a tool where the learner has the ability to control the pace of learning.</p> <ul style="list-style-type: none"> <li>• “I would like to do a module at your own pace.”</li> <li>• “I retain more, I get to do it (learning) at my own pace, if I don’t understand something I can go back and re-read it...”</li> </ul>	Learner Control Principle <sup>18</sup>

## Objective 2: Evaluation of the Technology-based Learning Tool

Thirty-seven adjusters consented and completed the baseline questionnaire for a participation rate of 33.6% (37/110). Of those, 35 adjusters were enrolled in the TBL tool curriculum; two were not enrolled because they resigned from employment shortly after providing consent. Of the 35 participants, 74.3% (26/35) completed all modules and case study; one started but did not complete all modules, and eight did not begin the modules. Of those who completed all modules and case study, 61.5% (16/26) evaluated the tool (Figure 7). All participants elected to participate in the study on their own time, none requested a time-release during office working hours.

Figure 7. Flow Diagram of Participation and Enrollment



### **Participant Characteristics (n=37)**

Most participants were female (n=32, 86.5%), and between the ages of 23-29 years (n=25, 67.6%) (Table 5). Most had been employed by Aviva for less than one year (n=19, 51.4%) and had been handling claims for 1-11 months (n=21, 56.8%). The majority of participants had between 1-4 years of work experience in automobile insurance industry (n=14, 37.8%). Most participants had post-secondary or professional education (n=33, 89.2%). Five participants (13.5%) indicated they had “poor” knowledge of the practice guideline on the management of neck pain and five (13.5%) reported that they “never” used guidelines to make decisions about treatment funding. Fourteen participants (37.8%) had no prior experience with TBL tools.

### **Evaluation of the Technology-based Learning Tool (n=16)**

Participants who completed the evaluation were similar to those who provided informed consent. Most participants who evaluated the tool were female (n=12, 75.0%) and between the ages of 23-29 years (n=10, 62.5%) (Table 5). Most were employed by Aviva for less than one year (n=9, 56.2%) and had been handling claims for 1-11 months (n=9, 56.2%). Most disclosed having post-secondary or professional education (n=13, 81.3%). Three participants reported (18.7%) having “poor” knowledge of the neck pain guideline and two reported “never” (12.5%) using practice guidelines to make treatment funding decisions. Almost all reported being proficient with computers (n=15, 93.7%) and seven (43.8%) indicated having no prior experience with TBL tools.

Table 5. Participant Characteristics

<b>Characteristic</b>	<b>Provided Informed Consent (n=37)</b>	<b>Completed TBL Tool Evaluation (n=16)</b>
<b>Age</b>		
23-29	25 (67.6%)	10 (62.5%)
31-39	5 (13.5%)	4 (25.0%)
47-61	7 (18.9%)	2 (12.5%)
<b>Gender</b>		

Male	5 (13.5%)	4 (25.0%)
Female	32 (86.5%)	12 (75.0%)
<b>Duration of employment at Aviva Canada</b>		
1-11 Months	19 (51.4%)	9 (56.2%)
1-4 Years	13 (35.1%)	5 (31.3%)
5-15 Years	4 (10.8%)	2 (12.5%)
16 or More Years	1 (2.7%)	0
<b>Experience in the automobile insurance industry</b>		
Less than 1 Month	6 (16.2%)	3 (18.7%)
1-11 Months	9 (24.3%)	4 (25.0%)
1-4 Years	14 (37.8%)	5 (31.3%)
More than 4 years	8 (21.6%)	4 (25.0%)
<b>Experience handling Accident Benefits claims</b>		
Less than 1 Month	2 (5.4%)	1 (6.2%)
1-11 Months	21 (56.8%)	9 (56.2%)
1-4 Years	11 (29.7%)	5 (31.3%)
More than 4 years	3 (8.1%)	1 (6.2%)
<b>Education</b>		
High School or Some College or University (No Diploma or Degree)	4 (10.8%)	3 (18.7%)
College Diploma or University Degree or Professional Degree	33 (89.2%)	13 (81.3%)
<b>Certified insurance professional</b>		
Yes	5 (13.5%)	3 (18.7%)
No	32 (86.5%)	13 (81.2%)
<b>Knowledge of clinical practice guideline for neck pain</b>		
Excellent	1 (2.7%)	1 (6.2%)
Very Good	3 (8.1%)	1 (6.2%)
Good	16 (43.2%)	7 (43.8%)
Fair	12 (32.4%)	4 (25.0%)
Poor	5 (13.5%)	3 (18.7%)
<b>Usage of evidence-based clinical practice guidelines to make decisions about treatment</b>		
Never	5 (13.5%)	2 (12.5%)
Sometimes	22 (59.5%)	9 (56.2%)
Always	10 (27.0%)	5 (31.3%)

Previous experience with technology-based learning tools		
Yes	23 (62.2%)	9 (56.2%)
No	14 (37.8%)	7 (43.8%)
Proficiency with computers		
Yes	35 (94.6%)	15 (93.7%)
No	2 (5.4%)	1 (6.2%)

## Technology-based Learning Tool Evaluation

### *Quantitative Component*

Sixteen participants evaluated the TBL tool using the LOES-S (Table 6). The raw LOES-S scores and 5-point Likert scale are presented in Appendix L.

All but one “learning construct” item achieved a median score of 4.0/5.0 (Table 6). The item “the graphics and animations from the tool helped me learn,” obtained a median score of 3.5/5.0.

Table 6. Learning Object Evaluation Scale for Students (n=16)

LOES-S items	Agree <sup>1</sup> % (n)	Neutral <sup>2</sup> % (n)	Disagree <sup>3</sup> % (n)	Median <sup>4</sup> (IQR)
<b>Learning</b>				
1. Working with the tool helped me learn	81.3% (13)	12.5% (2)	6.3% (1)	4.0 (1.0)
2. The feedback from the tool helped me learn	75.0% (12)	12.5% (2)	12.5% (2)	4.0 (1.75)
3. The graphics and animations from the tool helped me learn	50.0% (8)	31.3% (5)	18.8% (3)	*3.5 (1.0)
4. The tool helped teach me a new concept	68.8% (11)	18.8% (3)	12.5% (2)	4.0 (2.0)
5. Overall, the tool helped me learn	81.3% (13)	6.3% (1)	12.5% (2)	4.0 (1.0)
<b>Design</b>				
6. The help features in the tool were useful	68.8% (11)	12.5% (2)	18.8% (3)	4.0 (2.0)
7. The instructions in the tool were easy to follow	100% (16)	0	0	4.5 (1.0)



8. The tool was easy to use	93.8% (15)	6.3% (1)	0	4.5 (1.0)
9. The tool was well organized	81.3% (13)	18.8% (3)	0	4.0 (1.0)
<b>Engagement</b>				
10. I liked the overall theme of the tool	75.0% (12)	12.5% (2)	12.5% (2)	4.0 (1.75)
11. I found the tool engaging	75.0% (12)	12.5% (2)	12.5% (2)	4.0 (1.75)
12. The tool made learning fun	68.8% (11)	12.5% (2)	18.8% (3)	4.0 (2.0)
13. I would like to use the tool again	68.8% (11)	12.5% (2)	18.8% (3)	4.0 (2.0)

<sup>1</sup>Rating of 4.0 or 5.0 (agree or strongly agree) was classified as “agree.”

<sup>2</sup>Rating of 3.0 (neutral) was classified as “neutral.”

<sup>3</sup>Rating of 1.0 or 2.0 (disagree or strongly disagree) was classified as “disagree.”

<sup>4</sup>A \*median score <4.0 on a 5-point Likert scale (minimum rating of 1.0 to maximum rating of 5.0) indicates room for improvement; more consideration from pedagogical and instructional design perspectives should be given.

### Optional Knowledge Assessments

All 33 quiz questions received response submissions (Appendix M).

### Discussion Boards

No questions or comments were posted.

### Technology-based Learning Tool Evaluation

#### *Qualitative Component*

Four participants answered the open-ended question following the LOES-S as shown in Table 7.

Table 7. Participant Comments (Open-ended Question)

Participant Comment	Count	Instructional Design or Pedagogical Theme
Many/some of the modules were very short and could have been combined/linked together.	2	Flexible use principle (personal learner preference for short modules to be combined) <sup>19,20,21</sup>  Andragogy principles <sup>22-25</sup>

<p>"Most of the modules it was discussing evidence based adjusting but there was very little evidence shared with us. I was looking for more information on the evidence we should be adjusting based on."</p>	<p>1</p>	<p>Flexible use (personal learner preference for more evidence)<sup>19,20,21</sup></p> <p>Andragogy principles<sup>22-25</sup></p> <p>ARCS model of motivation<sup>26,27</sup></p> <p>Constructivism<sup>29,30</sup></p>
<p>"I found the animations did not overall contribute to tool's purpose. They functioned to provide little and basic information in a drawn out manner."</p>	<p>1</p>	<p>Multimedia principle<sup>18</sup></p>

## Discussion

I developed a TBL tool to train Aviva adjusters about evidence-based claims adjudication and the evidence-based management of neck pain. I also evaluated the learning, design, and engagement constructs of the tool. The development of the tool incorporated qualitative methods to understand learner needs and preferences while integrating sound pedagogical and instructional design elements. To my knowledge this is the first TBL tool designed for automobile insurance claims adjusters. The evaluation of this tool indicates that most adjusters agreed with the learning, design, and engagement constructs of the tool. The next section provides an overview of my interpretation of the participants comments related to their experience with the tool and I offer some perspective on some important elements in digital education: optional quizzes, flexible learning and discussions boards.

### *Interpretation of Participants Comments*

Participants were asked to provide feedback following completion of the curriculum. Two participants disliked short modules and felt that these modules could have been combined into a longer one. The decision to develop short modules came from consultation with the Aviva advisory committee. Overall, the committee preference was for quick to the point modules, focusing on the key points because claims adjusters are

often pressed for time. Therefore, short modules could be completed faster. One participant indicated that most of the modules were discussing evidence-based adjusting but there was very little evidence shared through the tool; they were looking for more information on the evidence that should be used to adjudicate claims. The reason more evidence was not included was because it was firstly important from educational and instructional design perspectives to determine how learners using the TBL tool would evaluate the tool in terms of quality and ability to impact learning, before deciding to develop other learning tools for other injuries/more evidence. It is clear that different learners have different personal preferences for how and what knowledge is pedagogically constructed.<sup>29,30</sup> Therefore, it is important in insurance claims settings to consult with and consider learners personal preferences because adult learners need to participate in the planning and evaluation of their instruction.<sup>22-25</sup> In doing so, those developing instruction can not only tailor the learning content to meet the needs of corporate adult learners but also facilitate learner motivation.<sup>22-27</sup>

The multimedia principle refers to the use of words (printed text and audio) and graphics (images, charts etc.) rather than words alone.<sup>18</sup> It has been suggested that relevant graphics can promote deeper cognitive processing in learners.<sup>18</sup> Half of those who evaluated the tool were either neutral or disagreed that the graphics and animations helped them to learn, while the other half indicated that the graphics and animations contributed to their learning. This represented the greatest discrepancy in the construct item results. However, it was not clear whether it was more the graphics or the animations or the combination of both that adjusters were neutral and in disagreement with since little feedback was received. Nevertheless, the divide suggests that the multimedia learning principle deserves further attention and careful tool revision to ensure that the graphics and animations are relevant to the instruction and not simply decorative.<sup>18</sup> Prior to tool revision, I recommend that an evidence-based effort be utilized to determine how the combination of words, graphics and animations can create the most meaningful learning experiences that would appeal to a vast array of learners from pedagogical and instructional design perspectives.<sup>18</sup> It is possible that graphics and animations can be

integrated into instruction ineffectively. Therefore, it is important to determine how to best integrate words, graphics and animations into instruction to maximize learning, which are also consistent with rigorous research evidence on their instructional effectiveness.<sup>18</sup> Evidentially, pedagogical and instructional design decision-making are significant factors that can impact learners in different ways.

One participant commented that the animations did not contribute to the tool's purpose and provided little basic information in a drawn out manner. I created four animated videos for the study. The intent of the instructional videos was to offer learners a variety of visual elements and to augment the overall online learning experience. The use of video in my study served a specific purpose; to introduce adjusters to important new concepts such as "evidence-based claims adjudication" and "claimant-centered care" etc. to enable learners with little to no prior knowledge to process these concepts more easily.<sup>39</sup> Instructional video provides an alternative approach that may assist those learners having difficulties learning new, novel and abstract concepts.<sup>40</sup> All video content was broken down into small segments. The shortest video was 37 seconds long and the longest video was two minutes and seven seconds in length. Restricting videos to under four minutes helps to retain learner attention.<sup>41</sup> It is currently understood that instructional video is not a "silver bullet," meaning, the use of video alone will not promote effective learning.<sup>42</sup> However, instructional video can provide different perspectives of the same material rather than relying on one instructional method for conveying information, which may be beneficial for some learners.<sup>43</sup>

#### *Optional Knowledge Assessments*

My study demonstrated that the optional quiz questions received submissions. This would suggest that at least some participants did engage with the optional quizzes and possibly took the time to self-assess their learnt knowledge prior to proceeding the next lesson, may have re-tried a question after answering incorrectly or used the quizzes as a practice activity. Therefore, the inclusion of short quizzes at the end of self-directed, asynchronous online lessons with immediate feedback may be beneficial to promote motivation and

active learning while building knowledge and confidence.<sup>18,26,27,29-32</sup>

### *Flexible Learning*

Flexible learning enables learners to receive training at any time, from anywhere, on any device.<sup>9</sup> Claims adjusters have very heavy workloads. The fact that all participants opted to complete the modules outside the office suggests that insurance professionals require more choice surrounding how, where and when they learn. It is important for insurers to carefully assess the unique learning situation before deciding which approach of delivering information should be used to meet the learning needs. Regardless of which technology is used or which instructional mode of delivering information is chosen, insurers must always consider employees motivation to participate.

### *Discussion Boards*

Discussion boards in an asynchronous, self-directed module-based course affords learners the opportunity to interact, learn and share ideas amongst one another.<sup>33</sup> Although learners were encouraged to post any questions or comments about learning content on the tool's discussion boards, no comments or questions were posted. This could be a reflection of well-developed learning content which was clearly understood and therefore learners did not feel the need to post questions or comments. Alternatively, the lack of questions or comments could reflect the possibility that posting to the boards was perceived as too time consuming; there are delays between posting questions and responses and learners may be required to frequently check the boards for responses or to continue a discussion.<sup>44,45</sup> Lack of participation may also be reflective of reticent learners who may lack experience posting to boards.<sup>44,45</sup> Another reason could be the permanency of written discourse in the digital environment which can result in fears of criticism by others.<sup>45</sup> It is important to inquire about lack of participation because aside from the core curriculum, discussion boards in digital education have the ability to be a powerful accessory to learning.<sup>44</sup>

## **Strengths**

My study has strengths. The learning tool was developed in collaboration with Aviva Canada. Advisory committee preferences, applicable pedagogical theories, multimedia learning principles and universal instructional design principles were considered and incorporated. A specific strength was the approach used to develop and create the TBL tool, as demonstrated by the four sequential phases of development: 1) observation of Aviva claims adjusters; 2) consultation on the development of the TBL tool with an advisory committee of claims adjusters, managers and the claims learning and development team; 3) pedagogical and instructional design decision-making and; 4) storyboarding.

## **Limitations**

The qualitative thematic analysis of the Aviva observations and consultations and the open-ended question following the LOES-S did not undergo a paired double coding or inter-observer/inter-rater reliability process. Lack of resources and research funding made formal coding procedures and inter-observer/inter-rater reliability methods unfeasible for my study.

The LOES-S is valid and reliable for use in middle and high school environments.<sup>12</sup> However, there is no evidence to suggest that it is valid and reliable to use with automobile insurance claims adjusters. Although a limitation, the psychometric properties of the LOES-S were found to be valid and reliable which provides some confidence for its use in a corporate adult learner population.

It is possible that the low participation in the study led to selection bias. My study sample may not be representative of all Aviva adjusters. It is possible that those who participated in the study were more familiar or comfortable with TBL, more interested in learning about clinical evidence, may have preferred flexible learning, or may have been more accepting of TBL as an alternative, which could have produced a more favourable evaluation of the tool. Also, few participants in the sample were older, experienced adjusters. Potential barriers to participation in this cohort may include lack of time and

older employees being less amenable to adopt online learning.<sup>46</sup> Older employees are more likely to have gained expertise through in-class learning and may be less accustomed to online learning.<sup>46</sup> Limited participation from older and experienced adjusters may also be a result of the injury covered in the learning content. Experienced adjusters may be handling claims involving more significant injuries and may not have felt the clinical content was relevant to the claims they adjudicate.

## **Conclusion**

The results of this study indicate that most Aviva adjusters agreed with the learning, design and engagement constructs of the learning tool. Through careful consideration of pedagogy, instructional design, and learner preferences, online learning can be a promising alternative approach to train claims adjusters about clinical evidence in the future. Further research is needed to determine the effectiveness of the tool to improve claims adjusters knowledge of practice guidelines.

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## CHAPTER 5: DISCUSSION AND CONCLUSION

## **Introduction**

My master's thesis aimed to develop and evaluate a technology-based learning (TBL) tool to educate automobile insurance claims adjusters about the evidence-based claims adjudication for the management of Neck Pain and Its Associated Disorders (grades 1 & 2, 0-3 months post collision). To achieve this goal, I first systematically reviewed the literature to identify the best available evidence on the effectiveness of TBL tools used to improve claims adjusters' knowledge of clinical practice guidelines. I then developed an evidence-based claims adjudication framework to be used by automobile insurers to integrate evidence about the effectiveness and safety of clinical interventions when adjudicating traffic injury claims. Finally, I used the information gained in these two initial steps to develop and evaluate the pedagogical and instructional design properties of the TBL tool, designed to educate Aviva Canada Healthcare Services adjusters about evidence-based claims adjudication.

## **Summary of Results**

### *Systematic Review of the Literature*

The objective of my systematic review was to synthesize the best available evidence on the effectiveness of TBL tools designed to improve automobile insurance claims adjusters' knowledge of clinical practice guidelines. I found no studies investigating the effectiveness of TBL tools developed to improve claims adjusters' knowledge about clinical practice guidelines. This result was significant and it highlighted the need to develop and evaluate TBL tools for automobile insurance claims adjusters; this is a completely new field of research.

### *Development of the Evidence-based Claims Adjudication Framework*

The second objective of my thesis was to develop an evidence-based claims adjudication framework for claims adjusters by adapting Sackett's evidence-based medicine framework.<sup>1</sup> My proposed framework of evidence-based claims adjudication aims to provide adjusters the ability to critically appraise the clinical interventions proposed by

healthcare practitioners;<sup>2</sup> engage in informed and meaningful discussions with healthcare practitioners about the interventions being used to treat injuries;<sup>2</sup> and discuss the most appropriate treatment options with healthcare practitioners to facilitate claimant recovery.<sup>2</sup> The acceptance of evidence-based claims adjudication was necessary to develop the TBL tool and educate adjusters about the use of clinical practice guidelines when adjudicating claims.<sup>2</sup>

#### *Development of the Technology-based Learning Tool*

The third objective of my thesis was to develop a TBL tool to educate and train Aviva claims adjusters about evidence-based claims adjudication and the evidence-based management of grade 1 and 2, Neck Pain and Its Associated Disorders.<sup>2,3</sup> I informed the development of the tool by using pedagogy, multimedia and universal instructional design principles and preferences from an advisory committee of Aviva claims adjusters and managers. The online learning tool, which included 13 modules and one case study, was designed as an introductory, self-directed, and self-paced asynchronous module-based curriculum. The first few modules introduced learners to the concepts of evidence, evidence-based medicine, evidence-based claims adjudication and clinical practice guidelines. The remaining modules focused on the evidence-based management of recent onset neck pain.

#### *Evaluation of the Technology-based Learning Tool*

The final objective of my thesis was to evaluate the learning, design, and engagement constructs of the TBL tool in a sample of Aviva claims adjusters. I designed a cross-sectional evaluation study using the Learning Object Evaluation Scale for Students (LOES-S) as the outcome measure.<sup>4</sup> Most claims adjusters agreed with the learning, design and engagement constructs of the learning tool suggesting that the tool had adequate pedagogical and instructional design properties.

## **Significance of the Research for Automobile Insurance Claims Adjudication**

Advancements in technology are changing the ways we teach and learn. In most environments, new educational technologies are moving us away from the traditional method of teaching and learning. Yet, the insurance industry struggles to draw employees to online learning while it flourishes in secondary and post-secondary education. One main reason for this lag is believed to be time which has been identified as a barrier to learning for insurance professionals.<sup>5</sup>

It is argued that the shortcomings of traditional classroom approach have led to the emergence of online learning as a training alternative for corporations.<sup>6</sup> Some of these shortcomings include difficulty with finding an appropriate training location or identifying qualified trainers or instructors.<sup>6,7</sup> Another challenge is that traditional learning content is not always tailored to the needs of the corporate learner.<sup>6,7</sup> Finally, it can be challenging to take employees away from their work for training purposes.<sup>8</sup> Therefore, online learning can provide a solution for corporations because it enables employees to receive training at any time, from anywhere, on any device.<sup>8</sup>

Online learning also has its drawbacks. An online learning environment requires learners to be more self-directed and engaged because there may be fewer resources and prompts from the instructor to keep learners on path with the learning goals.<sup>9</sup> Furthermore, it has been suggested that not all learners respond naturally to online learning.<sup>5</sup> Therefore, instructors need to differentiate mature self-directed learners from those who are less able to steer their own learning.<sup>5</sup>

The benefits of adopting TBL for corporations include convenience, flexibility, accessibility, and consistency of education.<sup>10</sup> Employees can learn using any computer platform at the times and places which are suitable to them. TBL has the capability to include a variety of teaching methods such as audio, text, graphics, video and external links for additional information.<sup>6,8,10</sup> This type of learning also provides the opportunity to develop instruction that adapts to learners' learning styles to help improve knowledge transfer and translation.<sup>10,11</sup>

It has been argued that companies spend more money on transporting and housing trainees than on the actual training programs.<sup>8</sup> Thus, time spent away from the job for traveling to learn or sitting in a classroom/training room impacts employee productivity.<sup>6,7,8</sup> It has also been suggested that the proportion of baby boomers retiring in the insurance industry is five times higher than other financial sectors.<sup>5</sup> This presents an additional impetus to change training delivery methods as incoming younger hires may have different learning preferences and skill sets.

Regardless of the technology and instructional mode used to deliver information, instructors must consider employees' motivation to participate in a course. A main reason for failure of online learning in the corporate world is the gap between a learner's motivation and ability to adopt online learning.<sup>12,13</sup> Online learning is purposeless if employees are not motivated or equipped to use it.<sup>10</sup> For example, older learners may not be familiar with the various technological devices that exist today. Therefore, ensuring that learners have the technical skills to participate in online learning is a prerequisite to success.<sup>10</sup>

Throughout my research, I identified emerging themes that should be integrated into future development and evaluation of online learning tools for automobile insurance claims adjusters. First, corporate adult learners have personal preferences for how and what they learn. Therefore, when appropriate, learners should be consulted with prior to developing learning tools so their learning and design preferences can be factored into the development phase. Second, a careful evidence-based approach should be used to determine the most effective ways to integrate and use graphics and animations in online instruction to ensure relevancy and that meaningful learning experiences are being created for learners. Third, solutions to the lack of participation on discussion boards must be explored. It is important to inquire and consult with adjusters to determine if lack of participation is the result of clearly understood learning content or whether other perceived barriers prevented participation. Fourth, all participants in my study chose to participate on their own time and outside of office working hours.

Therefore, providing corporate learners with the ability to openly voice their preferences about how, when and where to learn is important. This could also impact an individual's ability and willingness to learn. Moreover, all of the aforementioned factors can also contribute to building and maintaining a culture of learning within the corporate environment.

Potential barriers to participation in the study could be adjusters' lack of time and the fact that participation in the study was completely voluntary as opposed to mandatory. Therefore, heavy workloads and stringent timelines coupled with the option to participate, makes it plausible that many adjusters may have simply opted to not participate during the study enrollment period in favor of utilizing their time to adjudicate their claims. Another barrier to participation could have been the injury covered in the learning content. Many experienced adjusters are handling claims involving more significant injuries (those extending beyond soft-tissue injuries) and they may not have felt that the clinical content was relevant to the type of claims they regularly handle.

To my knowledge, my thesis has the ability to stimulate the development of a field of research in automobile insurance traffic injury claims adjudication. I did not identify previous research that evaluated the pedagogical and instructional design elements of a TBL tool to disseminate clinical practice guidelines in the automobile insurance industry. I proposed an evidence-based claims adjudication framework for automobile insurance and this framework should be implemented and tested by other insurance companies. Evidence-based claims adjudication can assist insurers to integrate clinical evidence into injury claims adjusting and could potentially have a significant impact on claimant recovery and client services. I also collaborated with a large Canadian property and casualty insurer to develop a tailored TBL tool for injury claims adjusters with focused pedagogical and instructional design principles. The results of the evaluation can help to inform the future development of online learning tools designed for insurance professionals.



## **Personal Reflection**

Reflecting on my experience as an Accident Benefits claims adjuster, I understand that the integration of clinical evidence usage into the adjuster role is sensitive, complex and possibly daunting for some adjusters. Full integration of evidence-based claims adjudication will require time, proper implementation and a significant investment and commitment to providing ongoing support and training for adjusters. However, it is pivotal that insurers first acknowledge and establish understanding of the value that evidence-based practice brings to automobile insurance claims adjusting. Adjusters will need to construct a self-understanding of the importance of clinical evidence and view critical appraisal of treatment plans for effectiveness and safety as a critical step in their decision-making process that will have a direct impact on a claimant's path to recovery. I anticipate that clinicians providing healthcare to injured claimants within the compensation system will appreciate and support the implementation of evidence-based claims adjudication because the framework emphasizes a claimant-centered care approach. Hence, I did not create evidence-based claims adjudication to simply integrate clinical evidence into the adjudication of traffic injury claims but rather, to give purpose for its use in a way that could be appreciated by adjusters of all levels, experience and skillsets. I also developed the framework to help to improve interactions amongst all parties involved in each claim which may facilitate collaborative working relationships in the future. I believe the use of evidence-based claims adjudication significantly raises the bar on how Ontario Accident Benefits claims should be adjudicated, and it may have a significant impact on the recovery of injured claimants and their claims experience within the compensation system.

Although the sample size for this study was small, the results are useful. Although the participation rate was lower than expected, it should not be assumed that lack of participation equates to adjusters disapproving or not seeing the merits of evidence-based practice within the claims adjudication environment. The nature of automobile insurance claims leads to adjusters having very heavy workloads while needing to cope with the requirement of achieving claim closure in a timely manner. Therefore,

attending to each claim by responding to treatment plan requests from healthcare providers and initiating claimants' specified benefits while adding new claims etc. leaves little time for continued education and training.

Teaching and learning initiatives in the insurance industry remains largely mandatory and in-class lecture based. Few flexible learning options are available and little diversity in instructional methods are used to teach. In the future, the insurance industry will need to build, support and maintain a culture of continued learning informed by scientific evidence. This includes a culture of learning that supports the importance of communication, learning, trust, cooperation and innovation.<sup>14</sup> It will be important for insurers to develop effective strategies to engage employees to embrace and participate in voluntary educational interventions.

### **Strengths**

A main strength of my thesis is the development of the learning tool in collaboration with claims adjusters and managers employed at Aviva Canada. Moreover, pedagogical theories, multimedia learning principles and universal instructional design principles were considered and incorporated into the tool's development. I carried out a systematic review which employed a standardized methodology to find current best evidence on the effectiveness of TBL tools to improve claims adjusters' knowledge of practice guidelines. Finally, I adapted Sackett's evidence-based medicine to make the concept and components of evidence-based claims adjudication relevant for claims adjusters. Sackett's evidence-based medicine is a universally known framework and it is the preferred approach for healthcare.

### **Limitations**

The LOES-S is valid and reliable for use in the middle and high school environments.<sup>4</sup> However, there is no evidence to suggest that it is valid and reliable to use with automobile insurance claims adjusters. The cross-sectional evaluation study obtained a lower than expected participation rate, especially amongst older and experienced Aviva claims adjusters. This may have led to selection bias in the evaluation of the tool. It is

possible that those who participated in the study may have preferred flexible learning, were more interested in learning about clinical evidence or were more familiar and comfortable with online learning.

### **Conclusion and Next Steps**

The development of the TBL tool placed less emphasis on the technology itself and more emphasis on making sound pedagogical and instructional design decisions while incorporating claims staff preferences. Knowledge and use of evidence-based claims adjudication presents a promising approach to provide high-quality claims care which may help to improve the health outcomes of claimants injured in traffic collisions. Further research is needed to determine effectiveness and implementation of the evidence-based claims adjudication framework. Also, the effectiveness of online learning tools to teach and improve claims adjusters' knowledge about clinical evidence needs to be investigated in the future.

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## APPENDICES

## Appendix A: MEDLINE Search Strategy

Search run April 10, 2017 and re-run on April 29, 2019 in Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present

1. Guideline Adherence/
2. Practice Guidelines as Topic/
3. CPGs.ab,kf,ti.
4. (guideline\* adj4 (adher\* or clinical or consensus or disseminat\* or implement\* or practice)).ab,kf,ti.
5. 1 or 2 or 3 or 4
6. Computer-Assisted Instruction/
7. Internet/
8. e-learning.ab,kf,ti.
9. (electronic adj4 (device\* or learn\* or teach\*)).ab,kf,ti.
10. (interactive adj4 (learning or lecture\* or multimedia)).ab,kf,ti.
11. Internet.ab,kf,ti.
12. ((online or on-line) adj4 (educat\* or instruction or lecture\* or learn\* or model\* or teach\*)).ab,kf,ti.
13. 6 or 7 or 8 or 9 or 10 or 11 or 12
14. Insurance Carriers/
15. Insurance, Health, Reimbursement/
16. Insurance Claim Reporting/
17. Insurance Claim Review/
18. (insurance adj4 (claim\* or adjust\* or provider\* or review\* or staff\*)).ab,kf,ti.
19. insurer\*.ab,kf,ti.
20. payer polic\*.ab,kf,ti.

21. 14 or 15 or 16 or 17 or 18 or 20

22. 5 and 13 and 21

23. 5 and 21

24. limit 23 to english language

## Appendix B: Overview of Pedagogy, Instructional Design Principles and TBL Tool Application

Learning Theory	Overview and TBL Tool Application
Adult Learning Theory & Andragogy Principles	<p>The adult learning theory assumptions and principles of andragogy (practice of teaching adults) were drawn upon because they help to explain and understand how adults learn.<sup>1,2</sup> Adult learning theory makes five assumptions.<sup>1,2,3</sup> First is self-concept, as an individual matures their self-concept shifts from a dependent personality to a more self-directed one.<sup>1,2,3</sup> Second, is the adult learner's experience, individuals continually acquire experience through age and this becomes a resource in their learning.<sup>1,2,3</sup> Third, is readiness to learn, as an individual matures, their readiness to learn becomes adjusted to the developmental tasks of their social roles.<sup>1,2,3</sup> Fourth, is orientation to learning, as individuals mature their time perspective shifts from application of knowledge to immediacy of application and from subject centeredness to problem-based learning.<sup>1,2,3</sup> The final assumption is motivation, as individuals mature so does their internal motivation to learn.<sup>1,2,3</sup> I developed tool on the premise of adult learning theory and principles of andragogy; taking the fundamental perspective that corporate adult learners are capable of autonomous self-directed learning.<sup>1,2,3</sup></p> <p>Knowles first andragogy principle states that adult learners need to participate in the planning and evaluation of their instruction.<sup>1,2,4</sup> Therefore, adult learners need to feel involved in the development of an online curriculum.<sup>1,2,4</sup> The formation of an advisory committee informed the development of the</p>



	<p>learning tool. Their personal preferences for online learning and feedback on the presentation of the learning content throughout the development process ensured that the tool and its content was tailored and appropriate to meet their needs.</p> <p>The second principle states that experience provides the basis for the learning activities.<sup>1,2,4</sup> It is the learning experience that adult learners' value and not necessarily the end result of learning.<sup>1,2,4</sup> One focus in the development of the tool and its content was not to simply develop content that learners would need to memorize. Rather, the tool itself became a resource that learners could refer back to when required. The educational intervention aimed to promote critical assessment skills which are needed to determine whether a proposed treatment regimen is effective, safe and going to be a facilitator of claimant recovery.</p> <p>The third principle stipulates that adult learners are most interested in learning subjects that have immediate relevance and impact to their job.<sup>1,2,4</sup> Learners must be able to connect the content learnt to a real-world matter.<sup>1,2,4</sup> If the learner cannot see how participating in an online course will help them to apply the knowledge gained to a real-life situation then learner motivation and engagement may be reduced.<sup>1,2,4</sup> The tool was developed in response to a current issue in Ontario's automobile insurance industry; claims adjusters lack an adequate amount of medical and rehabilitation knowledge. This</p>
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	<p>learning tool starts to address this knowledge gap, making the tool purposeful and relevant to learners in need of knowledge related to clinical evidence.</p> <p>Finally, adult learning is problem-centered rather than content-oriented.<sup>1,2,4</sup> Learning content should be problem-based because adult learners want immediate gratification of seeing how the instruction will assist them to solve a problem outside of the online learning situation.<sup>1,2,4</sup> The tool was developed to promote comprehension and application of acquired knowledge as opposed only memorization of facts. Learners were taught how to critically evaluate treatment plans for effectiveness and safety and were taught the evidence-based claims adjudication steps to take in order to make evidence-based claims decisions.</p>
ARCS Model of Motivation	<p>ARCS model of motivation stipulates four ways (attention, relevance, confidence and satisfaction) of encouraging and maintaining learner motivation during the learning process.<sup>5,6</sup> Components of the model were incorporated into the development of the tool to promote learner motivation.</p> <p>Attention refers to the process of gaining and sustaining a learner's attention.<sup>5</sup> The following components were used to gain and sustain learner attention:</p> <ul style="list-style-type: none"> <li>• Humor: Lighthearted comics were included to illustrate course concepts.<sup>5,6</sup></li> <li>• Conflict: There was a presentation of facts which participants may not be aware of, or contrary to what they may believe to be true.<sup>5,6</sup></li> </ul>

	<ul style="list-style-type: none"> <li>• Variety: A variety of different technologies such as text on screen, video, and audio voiceovers etc. was included in the tool.<sup>5,6</sup></li> <li>• Real world, relatable examples: The curriculum began by presenting learners with a real-life automobile insurance problem (adjusters lacking adequate medical/rehabilitation/clinical evidence knowledge) and relatable claims examples were presented when applicable.<sup>5,6</sup></li> </ul> <p>Relevance refers to connecting a lesson's content to the learner's present or future job demands.<sup>5</sup> The following components were used to establish relevance:</p> <ul style="list-style-type: none"> <li>• Perceived present worth: The tool provided introductory training to facilitate claims adjusters moving towards an evidence-based claims adjudication approach.<sup>5,6</sup></li> <li>• Perceived future usefulness: The knowledge gained from the online course will help claims adjusters to integrate the best available clinical evidence into claims adjudication in the future.<sup>5,6</sup></li> </ul> <p>Confidence refers to assisting learners to form favorable expectancies for success and thereafter actually experiencing a sense of personal success under the conditions whereby the learner can relate their success to their actual learning efforts.<sup>5,6</sup> The following components were used to build confidence.</p> <ul style="list-style-type: none"> <li>• Communicate objectives: Learning goals for each module were communicated to the learner prior to beginning the module's educational content.<sup>5,6</sup></li> </ul>
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	<ul style="list-style-type: none"> <li>• Provide feedback: Immediate feedback was provided following the self-assessment quiz in each learning module.<sup>5,6</sup> The content for the quizzes was directly related to the content presented in each module.</li> <li>• Learner control: The learning tool was self-directed, making the learner in control of their learning experience, and they will progress through the tool at their own desired pace, with the ability to return to previously reviewed material as many times as they wish.<sup>5,6</sup></li> </ul> <p>Satisfaction refers to the opportunities to apply acquired knowledge and recognition which facilitates a learner's feelings of satisfaction.<sup>5</sup> The following components were employed to promote learner satisfaction:</p> <ul style="list-style-type: none"> <li>• Immediate application: Following the learning modules, participants should be able to begin critically assessing treatment plan requests and directly using clinical evidence in claims decision-making.<sup>5,6</sup></li> </ul>
Problem-based Learning	<p>Problem-based learning is an instructional method where learners, learn by problem solving.<sup>7</sup> Learners engage in self-directed learning and apply acquired knowledge to solve a problem.<sup>7</sup> Some of the goals of problem-based learning include the ability to develop flexible knowledge, become an effective problem solver and develop self-directed learning skills and intrinsic motivation.<sup>7</sup> The tool emphasized problem-based learning and the application of knowledge. The tool included one comprehensive case study. This required learners to review the case study and apply the concepts presented in the modules to make an</p>

	evidence-based claims decision. The case study involved a hypothetical, yet realistic claims scenario and treatment plan request. Expectations of the learners included comprehension of the learning content, critical assessment of the therapeutic interventions being requested and application of acquired knowledge to facilitate making an evidence-based claims decision.
Constructivism	Constructivist learning theory argues that learners bring their own learning experiences, knowledge, feelings and skills to a learning situation and learners construct their own understanding by making sense of their own unique experiences. <sup>8</sup> Learners construct their own knowledge as they engage in the learning process. <sup>9</sup> Constructivism was considered in the development of the learning tool because the tool introduced learners to new concepts. Learners were taught how to and why they should be making evidence-based claims adjudication decisions. Learners were afforded the opportunity to construct new understandings about what evidence-based claims decision-making means and why it is important to adjudicating claims. The learning tool provided learners with a new skill set; critically assessing treatment plan requests for effectiveness and safety and demonstrating how to use clinical evidence to make good claims decisions.
Activity Theory	Activity theory stems from the idea that human activity is carried out by a series of actions through the use of physical or psychological tools. <sup>10</sup> The eight-step model was used to guide the consideration of activity theory. <sup>11</sup> The <i>activity</i> was completion of the tool's modules and case study. <sup>11</sup> The <i>objective</i> was to educate and train adjusters on clinical evidence and evidence-based claims adjudication in order to facilitate evidence-based claims decision-making. <sup>11</sup> The <i>subjects</i> were Healthcare Services adjusters. <sup>11</sup>

	<p>The <i>tool</i> used to deliver the educational intervention was the technology-based learning tool, which participants were able to gain access to via desktop computer or laptop.<sup>11</sup> The rationale for the use of technology is convenience, flexibility, accessibility and consistency of information as well as to determine if online learning is an ideal method for training adjusters about practice guidelines. The <i>rules and regulations</i> governing use of the tool was that the modules were self-directed and self-paced, making the learner in full control of their learning experience.<sup>11</sup> Other governing rules were the optional quizzes. Learners were encouraged to post any questions or comments about learning content on the discussion boards, so all learners participating in the online curriculum could benefit from the questions and responses. <i>Division of labour</i> refers to learners being solely responsible for progressing through the learning content.<sup>11</sup> I was responsible for providing responses to any discussion board questions or comments. The <i>community</i> were the adjusters who participated in the educational intervention and participated in the discussion boards.<sup>11</sup> Finally, the <i>outcome</i> was completion of the online curriculum and acquisition of new knowledge.<sup>11</sup></p>
Connectivism	<p>Connectivism is the use of technology to form a learning community.<sup>12,13</sup> The inclusion of discussion boards affords learners the opportunity to interact, learn and share ideas amongst one another.<sup>12</sup> Discussion boards contained within the tool allowed learners to ask questions and post comments about the learning content and engage in conversation threading. The use of discussion boards in an online, asynchronous, self-directed, module-based curriculum helps create an atmosphere where learners can</p>

	communicate with each other and the instructor in one central location and not feel isolated while learning on their own.
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<b>Multimedia Learning Principle</b>	<b>Definition and TBL Tool Application</b>
Coherence <sup>14</sup>	<p>Individuals learn better when material that does not support the learning objectives are avoided.</p> <ul style="list-style-type: none"> <li>-All modules were kept simple and uncluttered.</li> <li>-LMS pages/slides were void of extraneous words, pictures and sounds.</li> </ul>
Contiguity <sup>14</sup>	<p>Individuals learn better when words are aligned to the corresponding graphic.</p> <ul style="list-style-type: none"> <li>-All text was aligned in close proximity of the corresponding graphic on screen.</li> </ul>
Learner Control <sup>14</sup>	<p>Individuals learn better when given control of their learning.</p> <ul style="list-style-type: none"> <li>-The tool allowed learners to control the pace of self-directed learning, the “next” and “back” buttons enabled learners to progress through the tool at their own pace.</li> </ul>
Multimedia <sup>14</sup>	<p>Individuals learn better when words and graphics are used, rather than words alone.</p> <ul style="list-style-type: none"> <li>-Words (text and audio) and graphics (images, charts etc.) were used in the tool rather than words alone.</li> </ul>
Personalization <sup>14</sup>	<p>Individuals learn better when lessons are presented in conversational style of writing.</p> <ul style="list-style-type: none"> <li>-Conversational/informal language was used throughout all modules and case study.</li> </ul>

Practice <sup>14</sup>	<p>Individuals learn better when they are engaged with the learning content through selection and retrieval of newly learnt knowledge.</p> <ul style="list-style-type: none"> <li>-Optional quizzes (multiple choice, true/false) required learners to select the correct answers, immediate explanatory feedback of where they went wrong was provided after an incorrect answer was selected.</li> <li>-Learners were permitted to re-try quiz questions, without restriction on the number of attempts.</li> </ul>
Pre-training <sup>14</sup>	<p>Individuals learn better when they know the names and characteristics of main concepts.</p> <ul style="list-style-type: none"> <li>-The tool provided pre-training of the names and key characteristics of key concepts such as evidence, evidence-based medicine, evidence-based claims adjudication and clinical practice guidelines prior to the introduction of the clinical practice guideline for recent onset neck pain.</li> </ul>
Redundancy <sup>14</sup>	<p>Individuals learn better when graphics are explained with words in audio or text, but not both.</p> <ul style="list-style-type: none"> <li>-The Venn diagrams created for evidence-based medicine and evidence-based claims adjudication were explained with audio narration rather than audio and printed text.</li> </ul>
Segmenting <sup>14</sup>	<p>Individuals learn better when lessons are broken down into learner-paced segments rather than one continuous segment.</p>



	-All key concepts were presented one at a time in separate modules under separate headings.
Thinking Skills <sup>14</sup>	<p>Individuals learn better when the learning has a job or domain specific focus that is further enhanced by critical thinking.</p> <p>-The tool's case study aimed to promote learners' critical thinking skills by evaluating the effectiveness and safety of therapeutic interventions prior to making an evidence-based claims decision regarding a proposed hypothetical treatment plan request.</p>
Worked Examples <sup>14</sup>	<p>Individuals learn better when provided with step by step instructions on how to solve a problem or task.</p> <p>-The tool provided learners with step by step instructions on how to make an evidence-based claims decision when reviewing treatment plan requests.</p>

Universal Instructional Design Principle	Definition and TBL Tool Application
Community of Learners <sup>15-17</sup>	<p>Encouraging interaction amongst peers and the instructor within the online learning environment.</p> <p>-The availability of discussion boards in the tool permitted learners to post questions and comments about course content and engage in conversation threading.</p>

Equitable Use <sup>16-17</sup>	<p>Creating and designing instruction that is available online, anytime, anywhere.</p> <p>-Learners could access the tool from their work laptop or desktop, anywhere and at any time.</p>
Flexible Use <sup>15-17</sup>	<p>Creating and designing instruction that adapts to a wide range of learner abilities, preferences for learning, schedules and connectivity. Learners need choice in the methods of use.</p> <p>-The tool incorporated a variety of instructional tools to teach such video, audio, slide decks, diagrams and graphics.</p>
Instructional Climate <sup>15-17</sup>	<p>Creating a digital learning environment that is welcoming and inclusive and one that includes the instructor's involvement in discussion boards.</p> <p>-Learners were encouraged to post questions and comments about course content in the discussion boards.</p> <p>-I was responsible for reviewing all questions and comments and providing responses to any questions requiring clarification.</p>
Perceptible Information <sup>16</sup>	<p>Creating and designing instruction that effectively communicates information to the learner regardless of their surroundings and sensory abilities. For example, the use of appropriate screen and font preferences, screen and cursor magnifier, appropriate colors.</p> <p>-The tool was created using the system defaults for font, font colour and font weights.</p> <p>-Times New Roman was not the system's default font.</p>

Simple and Intuitive <sup>15-17</sup>	<p>Creating and designing instruction within the digital environment that is simple and straightforward. The interface design should be easy to understand regardless of the learner's experience, knowledge, language/technical ability and concentration level.</p> <p>-The tool's interface design was simple, navigation of the tool was easy, and learners had the ability to pause and resume the curriculum at any time.</p>
Technical and Physical Effort <sup>16</sup>	<p>Creating a digital learning environment that requires learner to exert limited physical effort.</p> <p>-All multimedia tools were directly embedded into the tool with limited use of external links.</p>

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## **Appendix C: Email Scripting for Vice-President of Claims**

**Email Subject Line:** Research Participants Needed!

**Body of Email:**

Good Morning/Afternoon Healthcare Services Advisors,

We are excited to inform you that Aviva is collaborating with researchers from the University of Ontario Institute of Technology on a project to evaluate a new technology-based learning tool. The educational tool was developed for Healthcare Services Advisors to learn about the latest clinical evidence and a new evidence-based claims adjudication framework.

This self-directed online course entitled “Evidence-based Claims Adjudication & The Evidence-based Management of Neck Pain (0-3 Months Post Collision)” will help you gain new knowledge about the clinical management of neck pain and its associated disorders. The course will also teach you ways to use an evidence-based claims adjudication approach and how it can be integrated within your role as a Healthcare Services Advisor. It will help you make evidence-based claims decisions, which will benefit your claimants.

The online course will be offered on Aviva’s Grow Portal.

In order to facilitate **flexible learning**, participation in the study can take place during work hours or on your own time using your work laptop. If you choose to participate during work hours, let your front-line manager know and they will accommodate completion of the course. Upon completion of the course, you will be asked to evaluate the technology-based learning tool.

**Eligible** persons for the study are currently employed Healthcare Services advisors handling Accident Benefits claims.

Members of the Aviva advisory committee, all managers and anyone else who helped to inform the development of the learning tool are **not eligible** to participate in the study.

Participation in the study is **completely voluntary** and your autonomy will be respected; you also have the **right to withdraw** from the study at any time. Participation in this study and performance on module quizzes or lack of participation in this study **will not** affect your employment at Aviva Canada.

Performance on the module quizzes will not impact your current or future job position at Aviva Canada. All quiz data will be captured using Elucidat Analytics. Once the course has been published to Aviva's Grow portal, the Aviva learning and development team will change the data settings to "do not capture personal identifiable data for this course." Once that is done all personal identifiable data is permanently removed. Aviva Canada inclusive of management will not be able to see the names or identifications for any of the users. Finally, there will be no related impact on your current work responsibilities and no human resources issues related to study involvement.

You will be asked to complete an **informed consent form** prior to being enrolled in the course.

If you are interested in participating, please review the attached document for more information and click on the following link <https://forms.gle/K4EA7Xkv75xJudSV9> to review the informed consent form.

If you have any specific questions about the study, please contact Keshini Moodley at [keshini.moodley@uoit.net](mailto:keshini.moodley@uoit.net).

Thank you for your consideration in participating in this study.

Sincerely,

Rosallie Papa-Reid

## **Appendix D: Study Information Letter**

Dear Aviva Canada Healthcare Services Advisor,

You are invited to participate in a study to evaluate a new technology-based learning tool designed to teach you about evidence-based claims adjudication and the evidence-based management of neck pain.

**Title of Research Study:** Evidence-based claims adjudication: A technology-based learning tool for automobile insurance claims advisors.

**Researcher:** Keshini Moodley, BSc (Hons), MHSc (Candidate)

**Principal Investigator:** Dr. Pierre Côté, DC, PhD

**Departmental and institutional affiliation(s):** University of Ontario Institute of Technology, Faculty of Health Sciences, Oshawa, ON, Canada

**Purpose:** The purpose of the study is to evaluate the learning, design, and engagement components of a technology-based learning tool developed to teach Healthcare Services Advisors at Aviva Canada about evidence-based claims adjudication and the evidence-based management of neck pain and its associated symptoms.

**Participants:** Eligible participants are Aviva advisors (handling Accident Benefits claims) located at the Markham office. Eligible participants must be capable of providing written informed consent in the English language.

**Type of Study:** This study is an evaluation of a technology-based learning tool, developed for Aviva Canada Healthcare Services Advisors.

**What will happen when I participate?** Before agreeing to participate, you will be asked to click on the link that has been provided to you within your work email (email sent from the vice president of Healthcare Services, Rosallie Papa-Reid). By clicking on the

link, you will be prompted to review the informed consent form and decide whether to participate or not. Completion of the online informed consent form will confirm your consent to participate; you will be asked to sign and date the informed consent form using your Aviva email address. Participating or withdrawing from the study will not affect your employment at Aviva Canada and all survey responses will remain confidential, your employer and the researchers will not be able to trace responses back to you.

Once the online informed consent is completed, you will be asked to complete a demographic questionnaire. The questionnaire will collect the following information: 1) age and gender; 2) years of employment at Aviva Canada; 3) years of experience in the automobile insurance industry; 4) years of experience handling Accident Benefit claims; 5) highest level of education; 6) certified insurance professional designation; 7) familiarity with the evidence-based neck pain and its associated disorders guideline; 8) use of evidence-based clinical practice guidelines; 9) previous experience with technology-based learning tools; and 10) self-rated proficiency with computers.

The Aviva claims learning and development team will email you notification of enrollment in the curriculum, and instructions on how to access the online Grow portal and login. You will progress through the online learning tool at your own pace. The learning tool will be divided into short modules, each focusing on a major component of the learning material.

Once self-directed learning is completed using the learning tool, you will be asked to complete the Learning Object Evaluation Scale for Students (LOES-S) to evaluate the learning, design, and engagement constructs of the learning tool. This questionnaire will allow you to rate the three constructs of the learning tool (13 questions) using a 5-point Likert scale. The questionnaire also includes one open-ended question for you to provide additional feedback, regarding your experience with the learning tool.



**How will knowledge be assessed?** A short quiz assessing your knowledge will be provided at the end of each module. Knowledge data will be captured using Elucidat Analytics. Once the course has been published, Aviva's learning and development team will change the data settings to "do not capture personal identifiable data for this course." That is, all personal identifiable data will be permanently removed, and Aviva Canada will not be able to see the names or identifications of any of the users.

**How will you evaluate the learning tool?** After participating in the learning tool, you will be asked to evaluate its learning, design, and engagement constructs using a standardized questionnaire. This questionnaire will ask you to rate the three constructs of the learning tool (learning, design and engagement). The questionnaire also includes one open-ended question for additional feedback.

**Time commitments:** It should take you approximately 2 hours to complete this course, but this time may vary from person to person. You will have a maximum of 2 weeks to complete the course and evaluation from the day you start. If you decide to participate during working hours, your manager will coordinate a time release to be used to complete the course and evaluation.

**Participation/Right to withdraw:** You are under no obligation to participate in the study. You are free to withdraw at any point in time. If you do not wish to take part in the study, you do not need to complete the informed consent form. If you withdraw from the research project at any time, any data that you have contributed will be removed from the study and you need not offer any reason for making this request. If you wish to withdraw information you have submitted, please contact Bevin Moolenschot from the UOIT IT Department by emailing [Ask@uoit.net](mailto:Ask@uoit.net) any time before August 31, 2019. UOIT IT will delete your data. You will be given information that is relevant to your decision to continue or withdraw from participation. Participation or lack of participation in the study or withdrawing from the study at any time will not affect your employment at Aviva Canada.

**Confidentiality:** You will be assigned a unique participant identification number which will link all of your study data. This information will be kept secure on the UOIT Google drive network. In 2026, seven years following the study, the data will be destroyed from the UOIT Google drive. Only the research team (including IT personnel) will have access to this password-protected information during the length of the study. All survey data will be de-identified and removed of direct identifiers following data collection and prior to data analysis. Participants will use their Aviva Canada email to access the informed consent form. Once the data is collected, the UOIT IT department will remove all identifying information and assign a participant identification. The participant identification will bear no resemblance to any of the participants personal identifiers.

**Participate:** If you would like to participate in the study, please click on the link provided within the email sent by Rosallie Papa-Reid, vice president of Healthcare Services, to review the informed consent form.

**UOIT Research Ethics Board:** This study has been reviewed by the University of Ontario Institute of Technology Research Ethics Board [REB #15254] and approved on April 2, 2019.

## **Appendix E: Informed Consent Form**

**Title of Research Study:** Evidence-based claims adjudication: A technology-based learning tool for automobile insurance claims advisors

You are invited to participate in a research study entitled **Evidence-based claims adjudication: A technology-based learning tool for automobile insurance claims advisors.**

This study has been reviewed by the University of Ontario Institute of Technology Research Ethics Board [REB #15254] and approved on April 2, 2019.

Please read this consent form carefully, and feel free to ask the Researcher any questions that you might have about the study. If you have any questions about your rights as a participant in this study, please contact the Research Ethics Coordinator at 905 721 8668 ext. 3693 or [researchethics@uoit.ca](mailto:researchethics@uoit.ca).

**Researcher:** Keshini Moodley

**Principal Investigator:** Dr. Pierre Côté

**Departmental and institutional affiliation(s):** University of Ontario Institute of Technology, Faculty of Health Sciences, Oshawa, ON, Canada

**Contact email:** [keshini.moodley@uoit.net](mailto:keshini.moodley@uoit.net)

**Funding:** Dr. Pierre Côté, Canada Research Chair in Disability Prevention and Rehabilitation

### **Background**

Traditional teaching in the automobile insurance industry involves classroom-style lectures led by an instructor. However, advancements in technology are changing the ways in which people learn and work. We know very little about whether technology-based teaching is helpful in teaching and educating claims advisors about the best

available treatments for neck pain and its associated disorders. This is why we are conducting this research.

**Purpose and Procedure:**

The purpose of this study is to evaluate the learning, design, and engagement components of a technology-based learning tool developed to teach Aviva Canada Healthcare Services Advisors about evidence-based claims adjudication and the evidence-based management of neck pain and its associated disorders.

If you agree to participate, you will be asked to complete an introductory online course offered on Aviva's Grow portal, to learn about evidence-based claims adjudication and the evidence-based management of neck pain. The technology-based learning tool provides a self-directed online method to learn the course content and you will be able to progress through the course at your own desired pace.

It should take you approximately 2 hours to complete the online course and evaluation, but this time may vary from person to person. You will have a maximum of 2 weeks to complete the course modules and evaluation from the date you begin. The evaluation is accompanied by one open-ended question, so you can provide us with more information about your overall learning experience, using the technology-based learning tool.

**Potential Benefits:**

Your participation in this study may be beneficial to you. You will be introduced to new concepts such as evidence, evidence-based medicine, evidence-based claims adjudication, and clinical practice guidelines. You will also learn about the evidence-based management of neck pain and its associated disorders, grade 1&2 (0-3 months post motor vehicle collision).

Upon completion of the learning tool you will have an understanding of the importance of clinical evidence and how it can be integrated into your role as an Aviva Canada Healthcare Services Advisor. More broadly, the direct use of clinical evidence in claims

decision-making may help to improve the health outcomes of claimants and may result in faster claim closures and reduced claims costs.

**Potential Risk or Discomforts:**

The learning tool will be available online, and therefore its use poses no risks. There are no physical risks (bodily injury, physical stress or administration of substances) involved in the study. Similarly, there are no psychological risks (feeling demeaned, embarrassed, worried, upset, or emotional stress) associated with participating. Participating in the study will not have any impact on your current and future job position at Aviva. Moreover, participating in the study and using the online learning tool will not impact your current work responsibilities and there are no human resources issues related to participating in the study. Finally, there are no social risks (loss of status, privacy, or reputation) greater than encountered in everyday life.

A potential risk is the possibility of feeling coerced by your employer to participate in the study. To minimize this risk, we have clearly explained to your employer that your participation must be completely voluntary; this was outlined in the email that you received from Rosallie Papa-Reid, vice president of Healthcare Services.

Another potential risk is the possibility of feeling that there may be a direct impact on your current or future job position at Aviva Canada due to participation in the study and performance on the knowledge quizzes contained within the course or lack of participation in the study. To minimize this risk, we have received a commitment from Aviva Canada that participation in the study and performance on the knowledge quizzes contained within the course or lack of participation in the study will not impact your current or future job position at Aviva Canada. All quiz data will be captured using Elucidat Analytics. Once the course has been published to Aviva's Grow portal, the Aviva learning and development team will change the data settings to "do not capture personal identifiable data for this course". Once that is done all personal identifiable data is permanently removed. Your employer will not be able to see the names or

identifications for any of the users. This was outlined in the email that you received from Rosallie Papa-Reid, vice president of Healthcare Services.

Finally, we have received a commitment from Aviva Canada that there will be no related impact on your current work responsibilities and no human resources issues related to study involvement. This was also outlined in the email that you received from Rosallie Papa-Reid, vice president of Healthcare Services.

You are free to participate in the study, and your autonomy will be respected; you also have the right to withdraw from the study at any time. Participation in the study and performance on the knowledge quizzes contained within the course or lack of participation in the study will not affect your employment at Aviva Canada.

#### **Storage of Data:**

The UOIT IT department (Bevin Moolenschot) will be assisting with the storage of data in a secure location. All data will be kept secure on a UOIT network through Google Suite. Google Suite will include encryption of data and only the UOIT IT department (Bevin Moolenschot), Dr. Pierre Côté, and Keshini Moodley, will have access to the data.

#### **Confidentiality:**

All information collected for the purpose of the research study will be kept in strict confidence at UOIT. Your employer will not have access to the information that you provide for the purpose of the study. The confidentiality of your data will be protected by encrypting your data and storing it securely using Google Suite. Only the UOIT IT department (Bevin Moolenschot), Dr. Pierre Côté, and Keshini Moodley, will have access to the data.

All data will be de-identified and stripped of direct identifiers prior to data analysis. Once the data is collected, the UOIT IT department will remove all identifying information and assign a participant identification. The participant identification will

bear no resemblance to any of your personal identifiers. The IT department will destroy the identifiers and provide Dr. Pierre Côté with de-identified data files that will be stored on the University of Ontario Institute of Technology cloud. A code will not be kept allowing future re-linkages of identifiers. No names or identifying information will be used in any analyses, publications or presentations.

Your privacy shall be respected. No information about your identity will be shared or published without your permission, unless required by law. Confidentiality will be provided to the fullest extent possible by law, professional practice, and ethical codes of conduct. Please note that confidentiality cannot be guaranteed while data are in transit over the Internet.

**Right to Withdraw:**

Your participation is voluntary, and you can answer only those questions that you are comfortable with answering. The information that is shared will be held in strict confidence and discussed only with the research team. You are free to withdraw at any point in time. If you do not wish to take part in the study, you do not need to complete the informed consent form. If you withdraw from the research project at any time, any data that you have contributed will be removed from the study and you need not offer any reason for making this request. If you wish to withdraw information you have submitted, please contact Bevin Moolenschot from the UOIT IT department by emailing [Ask@uoit.net](mailto:Ask@uoit.net) any time before August 31, 2019. UOIT IT will delete your data and your withdrawal will not be communicated to Aviva or the research team. Participation or lack of participation in the study or withdrawing from the study at any time will not affect your employment at Aviva Canada.

**Debriefing and Dissemination of Results:**

You will be informed of the results of the study, if interested, once published to a peer-reviewed journal. If you are interested in learning the results of the study, please contact Dr. Pierre Côté, the principle investigator, at [pierre.cote@uoit.ca](mailto:pierre.cote@uoit.ca).

**Participant Concerns and Reporting:**

If you have any questions concerning the research study or experience any discomfort related to the study, please contact the researcher, Keshini Moodley at

[keshini.moodley@uoit.net](mailto:keshini.moodley@uoit.net).

Any questions regarding your rights as a participant, complaints or adverse events may be addressed to Research Ethics Board through the Research Ethics Coordinator –

[researchethics@uoit.ca](mailto:researchethics@uoit.ca) or 905.721.8668 x. 3693.

By consenting, you do not waive any rights to legal recourse in the event of research-related harm.

**Consent to Participate:**

1. I have read the consent form and understand the study being described;
2. I have had an opportunity to ask questions and my questions have been answered. I am free to ask questions about the study in the future;
3. I freely consent to participate in the research study, understanding that I may discontinue participation at any time without penalty. A copy of this Consent Form has been made available to me.

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(Name of Participant)	(Date)
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(Aviva Canada Employee Email Address)

☐ I have read the consent form and understand the study being described. I



have had an opportunity to ask questions and my questions have been answered. I am free to ask questions about the study in the future. I freely consent to participate in the research study, understanding that I may discontinue participation at any time without penalty. A copy of this Consent Form has been made available to me.

## **Appendix F: Baseline Questionnaire**

About yourself

**How old are you?**

\_\_\_\_\_ years old

**What gender do you identify with?**

- ☐ Male
- ☐ Female
- ☐ Prefer not to say
- ☐ Other \_\_\_\_\_

**How long have you been working at Aviva Canada?**

- ☐ Less than 1 month
- ☐ 1 month
- ☐ 2 months
- ☐ 3 months
- ☐ 4 months
- ☐ 5 months
- ☐ 6 months
- ☐ 7 months
- ☐ 8 months
- ☐ 9 months
- ☐ 10 months
- ☐ 11 months
- ☐ 1 year

- ☐ 2 years
- ☐ 3 years
- ☐ 4 years
- ☐ 5 years
- ☐ 6 years
- ☐ 7 years
- ☐ 8 years
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- ☐ 22 years
- ☐ 23 years
- ☐ 24 years
- ☐ 25 years
- ☐ 26 years
- ☐ 27 years
- ☐ 28 years
- ☐ 29 years

- ☐ 30 years
- ☐ More than 30 years

**How much of work experience do you have in the automobile insurance industry?**

- ☐ Less than 1 month
- ☐ 1 month
- ☐ 2 months
- ☐ 3 months
- ☐ 4 months
- ☐ 5 months
- ☐ 6 months
- ☐ 7 months
- ☐ 8 months
- ☐ 9 months
- ☐ 10 months
- ☐ 11 months
- ☐ 1 year
- ☐ 2 years
- ☐ 3 years
- ☐ 4 years
- ☐ 5 years
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- ☐ 26 years
- ☐ 27 years
- ☐ 28 years
- ☐ 29 years
- ☐ 30 years
- ☐ More than 30 years

**How long have you have handling Accident Benefits claims?**

- ☐ Less than 1 month
- ☐ 1 month
- ☐ 2 months
- ☐ 3 months
- ☐ 4 months
- ☐ 5 months
- ☐ 6 months

- ☐ 7 months
- ☐ 8 months
- ☐ 9 months
- ☐ 10 months
- ☐ 11 months
- ☐ 1 year
- ☐ 2 years
- ☐ 3 years
- ☐ 4 years
- ☐ 5 years
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- ☐ 26 years
- ☐ 27 years
- ☐ 28 years
- ☐ 29 years
- ☐ 30 years
- ☐ More than 30 years

**What is your highest degree or level of education completed?**

- ☐ Less than High School
- ☐ High School
- ☐ Some College or University, No Diploma or Degree
- ☐ College Diploma
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ Professional Degree (i.e. medicine, chiropractic, law, dentistry, pharmacy etc.)
- ☐ Doctorate/PhD

**Are you a Certified Insurance Professional (CIP)?**

- ☐ Yes
- ☐ No

**In general, would you say that your knowledge of the evidence-based clinical practice guideline for neck pain and its associated disorders is:**

- ☐ Excellent
- ☐ Very Good

- ☐ Good
- ☐ Fair
- ☐ Poor

**How often do you use evidence-based clinical practice guidelines to make decisions about treatment requests?**

- ☐ Never
- ☐ Sometimes
- ☐ Always

**Do you have any previous experience with technology-based learning tools?**

- ☐ Yes
- ☐ No

**Do you consider yourself proficient with computers?**

- ☐ Yes
- ☐ No



## **Appendix G: Announcement Scripting for Front-line Managers**

**Curriculum Title:** Evidence-based Claims Adjudication & The Evidence-based Management of Neck Pain (0-3 Months Post Collision)

**Course Enrollment:** Spring 2019

**Where:** Aviva's Grow Portal (On Work Time or On Your Own Time)

**Study Description:** Aviva Canada is collaborating with researchers from the University of Ontario Institute of Technology on a project to evaluate a new technology-based learning tool. The tool was developed to teach Healthcare Services advisors about a new approach to make decisions when adjudicating claims. This new approach, called "Evidence-based Claims Adjudication," uses the best research to help you manage the healthcare of claimants.

**Course Description:** This self-directed online course will help you enhance your knowledge of the clinical management of neck pain and its associated disorders, Grades 1&2 (0-3 months post collision). The course will also teach you how to use the evidence-based claims adjudication approach and how it can be integrated within your role as an advisor.

### **Who Can Participate?**

All Healthcare Services advisors are eligible for the research study. **Participation is completely voluntary.** Participation in this study will not affect your employment at Aviva Canada.

Members of the advisory committee, all managers and anyone else who helped to inform the development of the learning tool are **not eligible** to participate in the study.

You will receive an email from Rosallie Papa-Reid to invite you to participate. The email will include a link to the informed consent form, which you will need to complete before participation.

If you have any specific questions about the study, please contact Keshini Moodley at [keshini.moodley@uoit.net](mailto:keshini.moodley@uoit.net).


## Appendix H: One-paged Flyer

**AVIVA HEALTHCARE SERVICES ADVISORS**  
**You are invited to participate in a research study!**


**“EVIDENCE-BASED CLAIMS ADJUDICATION: A TECHNOLOGY-BASED LEARNING TOOL FOR AUTOMOBILE INSURANCE CLAIMS ADVISORS”**

**ENROLLMENT: SPRING 2019**  
**CLOSING DATE: AUGUST 31, 2019**  
**WHERE: AVIVA'S GROW PORTAL**  
**TIME COMMITMENT: APPROX. 2 HOURS**

IF YOU CHOOSE TO PARTICIPATE, YOU WILL HAVE A MAXIMUM OF **2 WEEKS** TO COMPLETE THE MODULES AND TOOL EVALUATION FROM THE DAY YOU START



**Facilitate Claimant Recovery By Making Evidence-Based Claims Decisions**

—  —

**THIS ONLINE COURSE WILL INTRODUCE YOU TO CLINICAL EVIDENCE & A NEW CLAIMS FRAMEWORK**

This study has been reviewed by the University of Ontario Institute of Technology Research Ethics Board [REB #15254] and approved on April 2, 2019

If you have any questions about the study, please contact Keshini Moodley at [keshini.moodley@uoit.net](mailto:keshini.moodley@uoit.net)

## **Appendix I: Study Email Scripting and YouTube Cartoon Video Frames**

**Email Subject Line:** UOIT Research Study!

**Body of Email:**

Dear Aviva Healthcare Services Advisors:

My name is Keshini Moodley and I am a graduate student at the University of Ontario Institute of Technology (UOIT).

Researchers from UOIT are collaborating with Aviva Canada and conducting a research study to evaluate a new technology-based learning tool.

I am emailing to ask you to consider participating in this important study for the automobile insurance industry.

Please click on the following link to learn more about the research study:

<https://www.youtube.com/watch?v=dmcC1bRDpkU>

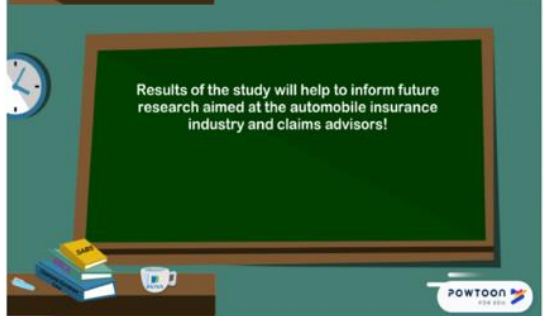
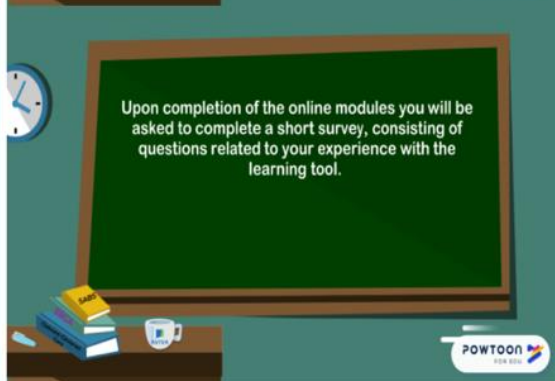
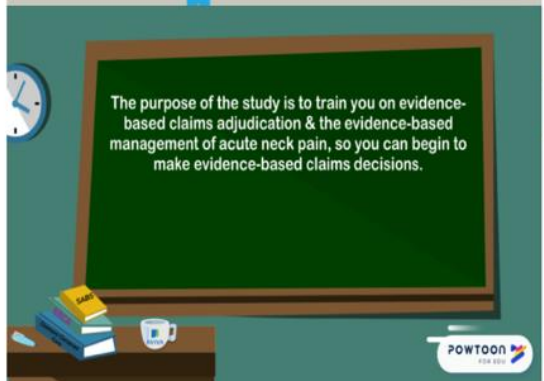
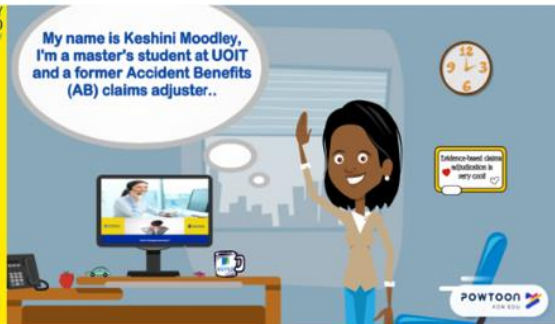
You will receive an email from vice-president, Rosallie Papa-Reid with additional information and the link to the informed consent form, if you wish to participate in the study.

If you have any questions, please do not hesitate to contact me at [keshini.moodley@uoit.net](mailto:keshini.moodley@uoit.net)

Thank you for your time and consideration.

Sincerely,

Keshini Moodley



## **Appendix J: Potential Questions/Answers Scripting for Front-line Managers**

1. What is this study about?

Answer: Aviva Canada is collaborating with researchers from the University of Ontario Institute of Technology on a project to evaluate a new technology-based learning tool. This type of study has not been previously done in Canada.

2. Do I have to participate in the study?

Answer: Participation in the study is voluntary, and you reserve the right to withdraw from the study at any time.

3. Do I have to complete the course?

Answer: Participation in the course is voluntary, and you reserve the right to withdraw from the course at any time.

4. Can I tell my co-workers that I am participating in the study and taking the course?

Answer: Participation in the study is confidential. To maintain confidentiality, you should consider going to a meeting room/unbookable room if completing the course during work hours.

5. How long will it take to complete this course?

Answer: It should take you approximately 2 hours to complete this course, but this time may vary from person to person. The course was designed to be a self-directed course, which means that you will progress through the course at your own pace.

6. Can I take this course outside of work time?

Answer: The course can be completed during work hours or on your own time using your work laptop. If completed during work hours, you will be allowed a time release of 1 hour (TBD by manager) at a time to complete the course. Should you require more time, speak to your manager.

7. How do I access this course?

Answer: The course will be offered through Aviva's Grow Portal.

8. How long do I have to complete the course?

Answer: You will have a maximum of 2 weeks to complete the course and evaluation from the day you start.

9. How long will this course be open for?

Answer: Enrollment into the course will take place in Spring 2019. The study closing date has not yet been determined.

10. What if I have questions about the course content?

Answer: You are encouraged to use the discussion boards related to each course module to post questions. Answers to your questions will be posted the next day.

11. What topics will be covered?

Answer: Evidence, evidence-based medicine, evidence-based claims adjudication, clinical practice guidelines, neck pain and its associated disorders (whiplash).

12. Why are other injuries not covered?

Answer: This is the first course. Before developing learning tools for other injuries, we need to know if the tool is helpful to teach you.

13. What is evidence-based claims adjudication, I have never heard of that?

Answer: It is a new framework for adjudicating Accident Benefit claims. The approach integrates best clinical evidence into the handling of claims. The approach will help you make evidence-based claims decisions when reviewing your claimants' treatment plans.

14. Will there be more training on the topics covered and other courses?

Answer: Yes, we will be coordinating ongoing training initiatives.

15. Will all other training sessions be online?

Answer: We will assess and determine what the best approach will be for ongoing training initiatives.

16. What is in it for me?

Answer: The course will provide you with an introduction to clinical evidence and will give you a basic understanding of how evidence can be incorporated in the handling of



your claims. This knowledge will help you to make evidence-based claims decisions, which will benefit your claimants.

## Appendix K: Learning Object Evaluation Scale for Students

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
<b>Learning</b>					
1. Working with the tool helped me learn	1	2	3	4	5
2. The feedback from the tool helped me learn	1	2	3	4	5
3. The graphics and animations from the tool helped me learn	1	2	3	4	5
4. The tool helped teach me a new concept	1	2	3	4	5
5. Overall, the tool helped me learn	1	2	3	4	5
<b>Design</b>					
6. The help features in the tool were useful	1	2	3	4	5
7. The instructions in the tool were easy to follow	1	2	3	4	5
8. The tool was easy to use	1	2	3	4	5
9. The tool was well organized	1	2	3	4	5
<b>Engagement</b>					
10. I liked the overall theme of the tool	1	2	3	4	5
11. I found the tool engaging	1	2	3	4	5
12. The tool made learning fun	1	2	3	4	5
13. I would like to use the tool again	1	2	3	4	5
14. Please provide any suggestions you may have to improve this technology-based learning tool					

### Appendix L: Learning Object Evaluation Scale for Students (Raw Study Results)

<b>LOES-S (n=16)</b>	<b>Strongly Disagree % (n)</b>	<b>Disagree % (n)</b>	<b>Neutral % (n)</b>	<b>Agree % (n)</b>	<b>Strongly Agree % (n)</b>
<b>Learning</b>					
1. Working with the tool helped me learn	6.3% (1)	0	12.5% (2)	37.5% (6)	43.8% (7)
2. The feedback from the tool helped me learn	12.5% (2)	0	12.5% (2)	37.5% (6)	37.5% (6)
3. The graphics and animations from the tool helped me learn	12.5% (2)	6.3% (1)	31.3% (5)	31.3% (5)	18.8% (3)
4. The tool helped teach me a new concept	6.3% (1)	6.3% (1)	18.8% (3)	25.0% (4)	43.8% (7)
5. Overall, the tool helped me learn	6.3% (1)	6.3% (1)	6.3% (1)	43.8% (7)	37.5% (6)
<b>Design</b>					
6. The help features in the tool were useful	12.5% (2)	6.3% (1)	12.5% (2)	25.0% (4)	43.8% (7)
7. The instructions in the tool were easy to follow	0	0	0	50.0% (8)	50.0% (8)
8. The tool was easy to use	0	0	6.3% (1)	43.8% (7)	50.0% (8)
9. The tool was well organized	0	0	18.8% (3)	37.5% (6)	43.8% (7)
<b>Engagement</b>					
10. I liked the overall theme of the tool	12.5% (2)	0	12.5% (2)	31.3% (5)	43.8% (7)
11. I found the tool engaging	12.5% (2)	0	12.5% (2)	37.5% (6)	37.5% (6)
12. The tool made learning fun	12.5% (2)	6.3% (1)	12.5% (2)	31.3% (5)	37.5% (6)
13. I would like to use the tool again	12.5% (2)	6.3% (1)	12.5% (2)	37.5% (6)	31.3% (5)

## Appendix M: Module Quiz Results for True/False and Multiple Choice Questions and the Number and Proportion of Times Answers Selected

### Module Quiz Results for True/False Questions and the Number and Proportion of Times Answers Selected

Module #	Question/Statement	Correct Answer	# Times True Selected n (%)	# Times False Selected n (%)
1	Evidence refers to the body of facts that states whether a belief is true? (n=28)	True	18 (64.3%)	10 (35.7%)
1	Evidence as noted in section 18(2) of the SABS refers to providing compelling medical evidence, which must be evidence-based? (n=37)	False	11 (29.7%)	26 (70.3%)
2	All healthcare practitioners who submit treatment plans to the insurer will be practicing evidence-based medicine? (n=26)	False	3 (11.5%)	23 (88.5%)
3	Clinicians' expertise in the evidence-based claims adjudication framework refers to advisors consulting with clinicians to understand their rationales when reviewing treatment requests. (n=27)	True	26 (96.3%)	1 (3.7%)

3	An evidence-based healthcare services advisor can ignore the SABS when practicing evidence-based claims adjudication? (n=28)	False	1 (3.6%)	27 (96.4%)
4	Clinical practice guidelines are guidelines that provide recommendations for effective treatment to help the claimant get back to pre-injury status. (n=26)	True	23 (88.5%)	3 (11.5%)
5	Neck Pain and Its Associated Disorders is defined as neck pain, stiffness or tenderness that is attributed to fractures and dislocations. (n=27)	False	8 (29.6%)	19 (70.4%)
6	Most claimants diagnosed with Neck Pain and Its Associated Disorders (NAD) are not expected to recover. (n=29)	False	2 (6.9%)	27 (93.1%)
7	Ineffective treatments hinder a claimant's recovery while effective treatments facilitate recovery. (n=26)	True	26 (100%)	0
7	A care pathway is defined as the stages of care. (n=26)	True	21 (80.8%)	5 (19.2%)
7	It's important for advisors to encourage claimants to discuss with their treating healthcare providers(s) the most effective course of treatment(s) available to treat their injuries. (n=26)	True	25 (96.2%)	1 (3.8%)
8	Structured patient education alone is recommended for treating Neck Pain and Its Associated Disorders, grade 1 and 2 (0-3 months post collision).			

	(n=25)	False	4 (16.0%)	21 (84.0%)
9	Range of motion (ROM) exercise is the gentle and controlled exercise of the neck and leg? (n=26)	False	7 (26.9%)	19 (73.1%)
10	Multimodal care involves one distinct treatment modality by one health care field. (n=26)	False	1 (3.8%)	25 (96.2%)
11	Evidence suggests that muscle relaxants for treating neck pain and its associated disorders, grade 1 & 2 (0-3 months) are beneficial when used over a prolonged period of time. (n=26)	False	2 (7.7%)	24 (92.3%)
12	Do not offer treatments are not recommended because they are very costly to insurers? (n=26)	False	1 (3.8%)	25 (96.2%)
12	Evidence suggests that neck braces can be beneficial for treating Neck Pain and Its Associated Disorders. (n=28)	False	4 (14.3%)	24 (85.7%)

Module Quiz Results for Multiple Choice Questions and the Number and Proportion of Times an Answer was Selected

Module #	Question, Statement/Options	Correct Answer	# Times 1 Selected n (%)	# Times 2 Selected n (%)	# Times 3 Selected n (%)
2	What are the key components of evidence-based medicine?				

	1. Evidence, Science, Patient Concern 2. Evidence, Patient Values, Judgement 3. Evidence, Research, Judgement (n=31)	2	8 (25.8%)	18 (58.1%)	5 (16.1%)
3	What are the components of evidence-based claims adjudication?				
	1. Evidence, Claims Cost, Claimant Concern, Advisor Judgement 2. Evidence, Claimants' Values, Advisor Expertise and Judgement, Clinicians' Expertise 3. Evidence, Clinical Judgement, Claims Cost, Patient Preferences (n=24)	2	1 (4.2%)	22 (91.7%)	1 (4.2%)
3	Shifting the focus means?				
	1. Shifting the focus from care to cost 2. Shifting the focus from cost to evidence 3. Shifting the focus from cost to care (n=26)	3	1 (3.8%)	2 (7.7%)	23 (88.5%)
3	Which of the following is correct?				
	1. Claimant-centered care requires a healthcare services advisor to share the decision making, consider the physical, mental/psychological and social/cultural factors and provide respectful and responsive care 2. Claimant-centered care requires a healthcare services advisor to share the costs, consider the physical injuries and provide respectful and responsive care 3. Claimant-centered care requires a healthcare services advisor to share the decision making, consider the physical and mental injuries and provide respectful and responsive care (n=24)	1	19 (79.2%)	1 (4.2%)	4 (16.7%)
4	Which of the following is correct?				

	1. Minor injury guideline and common traffic injury guideline are both evidence-based 2. Minor injury guideline is evidence-based, common traffic injury guideline is not evidence-based 3. Common traffic injury guideline is evidence-based, minor injury guideline is not evidence-based (n=26)	3	3 (11.5%)	1 (3.8%)	22 (84.6%)
5	Which of the following statements is correct?				
	1. Neck pain and its associated disorders (NAD) grade 2 involves major interference with activities of daily living (ADLs) 2. Neck pain and its associated disorders (NAD) grade 2 involves minor interference with activities of daily living (ADLs) 3. Neck pain and its associated disorders (NAD) grade 2 involves moderate interference with activities of daily living (ADLs) (n=25)	1	15 (60.0%)	5 (20.0%)	5 (20.0%)
6	Which of the following physical symptoms may be associated with Neck Pain and Its Associated Disorders (NAD)?				
	1. Knee pain 2. Arm pain 3. Foot pain (n=27)	2	0	27 (100%)	0
7	Which of the following statements is correct?				
	1. Two aims of the Neck Pain and Its Associated Disorders (NAD) guideline are to speed up recovery time and eliminate symptom intensity 2. Two aims of the Neck Pain and Its Associated Disorders (NAD) guideline are to speed up recovery time and reduce symptom intensity				



	1. Two aims of the Neck Pain and Its Associated Disorders (NAD) guideline are to speed up recovery time and increase symptom intensity (n=25)	2	6 (24.0%)	19 (76.0%)	0
9	Which statement is correct?				
	1. Unsupervised range of motion (ROM) exercises include flexion, lateral bending, rotation, retraction, distraction 2. Unsupervised range of motion (ROM) exercises include flexion, extension, lateral bending, retraction, manipulation 3. Unsupervised range of motion (ROM) exercises include flexion, extension, lateral bending, rotation, retraction (n=26)	3	3 (11.5%)	2 (7.7%)	21 (80.8%)
10	Which of the following statements is correct?				
	1. Manipulation and mobilization provide the same therapeutic benefits 2. Mobilization is more beneficial than manipulation 3. Manipulation is more beneficial than mobilization (n=32)	1	24 (75.0%)	5 (15.6%)	3 (9.4%)
11	Which of the following statements is correct?				
	1. As per the common traffic injury guideline, muscle relaxants are strongly recommended for grade 1 and 2 neck pain and its associated disorders (0-3 months) 2. As per the common traffic injury guideline, muscle relaxants are not recommended for grade 1 and 2 neck pain and its associated disorders (0-3 months) 3. As per the common traffic injury guideline, muscle relaxants are to be considered for grade 1 and 2 neck pain and its associated disorders (0-3 months) (n=20)	3	1 (5.0%)	0	19 (95.0%)

Case Study Quiz Results for True/False Questions and the Number and Proportion of Times an Answer was Selected

Case Study	Question/Statement	Correct Answer	# Times True Selected n (%)	# Times False Selected n (%)
	It's important for an advisor using evidence-based claims adjudication to consider whether proposed treatment(s) are effective, safe and whether they will help the claimant to recover from injury (n=25)	True	25 (100%)	0
	Healthcare providers are important to the recovery of claimants, therefore it's important to effectively communicate with them in order to understand their reasons for proposing certain treatments (n=25)	True	25 (100%)	0

Case Study Quiz Results for Multiple Choice Questions and the Number and Proportion of Times an Answer was Selected

Case Study	Question/Options	Correct Answer	# Times 1 Selected n (%)	# Times 2 Selected n (%)	# Times 3 Selected n (%)
	After reviewing the proposed treatment plan, what would be the best next step for an advisor?				

	<p>1. Some of the proposed treatments don't match with the recommended treatment in the clinical practice guideline, I will call the healthcare provider to effectively communicate my concerns, review the treatment plan and understand the healthcare provider's reasoning for proposing the treatments</p> <p>2. All of the proposed treatments don't match with the guideline; I will deny the treatment plan and proceed to a S44 insurer's examination for a second opinion</p> <p>3. The cost of the treatment plan is within the policy limits, the proposed treatments are commonly requested treatments for the diagnosed injury, I will approve the treatment plan this time</p> <p>(n=25)</p>	1	24 (96.0%)	0	1 (4.0%)
	<p>As an advisor using evidence-based claims adjudication, you have called the healthcare provider to respectfully and effectively communicate your concerns about the treatment plan because you know some of the treatments are ineffective for the injuries diagnosed.</p> <p>The healthcare provider advises that all of the proposed treatments are safe and appropriate for treating the claimant. She further explains that she has been in practice for 18 years and is adamant that all of the treatments are very effective and beneficial despite your reasoning. She confidently informs you that her patients report feeling better after receiving those treatments. The healthcare provider is not willing to revise the treatment plan at this time.</p> <p>What would be the best evidence-based claims adjudication decision?</p>				
	1. After listening, understanding, and considering the healthcare provider's rationale for proposing the treatments, you decide to approve the treatment plan because the healthcare provider is very experienced				

	<p>and strongly believes that all of the proposed treatments are effective for treating the claimant and she is not willing to revise the treatment plan</p> <p>2. After listening, understanding, and considering the healthcare provider's rationale for proposing the treatments, you decide to partially approve the treatment plan for the evidence-based treatments and proceed to a S44 insurer's examination to review the non-evidence-based treatments because insufficient justification for the use of ineffective treatments has been provided</p> <p>3. After listening, understanding, and considering the healthcare provider's rationale for proposing the treatments, you decide to approve the treatment plan because the cost is within the policy limits and the healthcare provider has concluded with confidence that her patients report feeling better after receiving the treatments</p> <p>(n=8)</p>	2	0	7 (87.5%)	1 (12.5%)
	Following every partial approval or denial of a treatment plan, an advisor using evidence-based claims adjudication should?				
	<p>1. Request the S44 insurer's examination with a physician and wait for the completed report</p> <p>2. Verbally communicate the partial approval or denial with the claimant and/or legal representative to ensure that they understand why the insurer's claims decision was made and arrange the S44 insurer's examination with a physician</p>				

	3. Request a S44 insurer's examination and answer any questions from the claimant and/or legal representative if they call regarding the treatment plan (n=7)	2	0	7 (100%)	0
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