



# “Breakthrough” to Describe Pain: A Concept Analysis

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Received: Sep 01, 2021

Accepted: Sep 30, 2021

Published Online: Oct 02, 2021

Journal: Journal of Psychiatry and Behavioral Sciences

Publisher: MedDocs Publishers LLC

Online edition: <http://meddocsonline.org/>

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**Keywords:** Breakthrough; Incidental; Concept analysis; Chronic pain; Hospitalized.

## Abstract

**Introduction:** Within the hospital setting, analgesics are prescribed for use with specific parameters of pain; labeled as (a) mild, (b) moderate, (c) severe, or (d) breakthrough. These subjective parameters are utilized casually. From a clinician perspective, analgesic regimens are discussed collaboratively, though there is a question about the ability of patients, and clinicians to truly understand these subjective terms. There is a societal priority to seek understanding of pain and pain management due to surfacing dangers of utilizing opioids. However, many chronic pain patients are progressively becoming negatively impacted by current efforts to prescribe analgesics with caution [1]. This analysis of breakthrough pain is intended to advocate for chronic pain patients that experience worsening pain in the hospital setting.

**Method:** A concept analysis was performed utilizing the eight major procedures described by Walker and Avant [2]. Procedures utilized for this analysis after breakthrough pain were selected as a suitable concept include: (a) uses of the concept, (b) defining attributes, (c) case construction, (d) antecedents, (e) consequences, (f) empirical referents, and (g) nursing implications. A selection of literature was taken from both the disciplines of healthcare and non-healthcare. The analysis also included a brief description of a major competing term, incidental, to provide further clarification of the concepts within the context of chronic pain management.

**Results:** A total of 47 papers were reviewed. Breakthrough pain is defined as an increase in pain that may occur in patients who already have chronic pain. It is influenced by a multitude of circumstances that cause a physiologic response in the patient which subsequently leads to increased pain perception. Attributes of breakthrough pain include: (a) increased pain, (b) unpredictable occurrences of pain, (c) pain that reduces functioning, and (d) need for intervention to relieve the pain. The consequences of breakthrough pain are (a) increased utilization of healthcare resources, (b) decreased patient functioning from baseline, and (c) increased pain intensity.



**Conclusion:** Understanding breakthrough pain in the acute care setting allows for future development, measurement, and evaluation of nursing interventions that may promote the best practice and effective pain management in chronic pain patients being admitted to the hospital setting.

## Introduction

The National Cancer Institute (NCI) website defines Breakthrough Pain (BTP) as, “an increase in pain that may occur in patients who already have chronic pain.” The NCI explains that BTP occurs in a variety of conditions, such as arthritis or fibromyalgia. The universality to apply BTP across many conditions leads to a concept that is complex and difficult to understand. Researchers have also attempted to define BTP by clarifying that it is an increase in pain that breaks through a baseline level of pain usually controlled by a chronic analgesic regimen [3]. Conceptual clarity and increased understanding of BTP is beneficial to clinicians taking care of these patients in the hospital setting because these patients may require treatment plans that are more aggressive than patients with acute pain. Studies have indicated that patients hospitalized with acute pain often feel helpless and have an increased desire for validation of their concerns [4]. The authors suggest that these feelings are amplified in patients experiencing breakthrough pain since they are already receiving a chronic analgesic. A comprehensive understanding that patients experience breakthrough pain while simultaneously utilizing opioids chronically can result in a better patient experience starting from population-specific nursing processes.

This analysis will establish a clear foundation for the use of breakthrough in the context of pain management. Providing concept clarification with clear applications to chronic pain will allow specialists the ability to build upon current literature, either through the development of robust pain assessment tools, or for adding to theoretical frameworks for researchers who have unique perspectives with managing this population.

The need for more advanced pain assessment tools is obvious as most hospitals currently rely on patient reported or observational tools [5]. The fidelity of these commonly used tools, such as the Numerical Rating Scale (NRS), is easily compromised when patients intentionally or unintentionally misrepresent their pain, creating an environment that allows for opioid misuse and abuse [6]. However, any efforts to combat misuse and abuse will be futile unless there is clarification of descriptive terms and uniformity to utilize them in the treatment of pain, especially when patients have a genuine need for aggressive regimens. The concept of breakthrough has already been operationalized in various settings, and the following is a summary of the various meanings of breakthrough currently available.

## Uses of the concept

According to Merriam-Webster (n.d.), breakthrough was initially used outside of the healthcare context, initially referring to a military reference of breaking through a barrier. Both Merriam-Webster and the Random House Unabridged Dictionary (2021) report first recorded use of breakthrough, as a noun, in 1915, though the exact date of first use was not found. Over time the word evolved and started to change connotation, implying medical advancements when referring to a breakthrough in the healthcare context. As referenced by Zeppetella, breakthrough was not clearly attempted to be defined for pain until 1990 by Portenoy and Hagen. In 1995 breakthrough was written to describe potential clinical findings that could arise from clinical trials [7]. Findings would be deemed as a breakthrough when beneficial effects of a treatment intervention were found. In contrast to Zeppetella, the authors’ literature review back to the year 1977, in the journal *Africa Link*, the International Planned Parenthood Federation Africa Region used breakthrough to describe enforcing regulations on fertility education to improve the quality of human life. Table 1 summarizes the initial search for literature regarding search results from search engines utilized for exploring the concept of BTP, and for summarizing the date of the oldest publication within the search results.

**Table 1:** Initial Search Engine Results for Discovering Breakthrough Pain.

	Breakthrough Results	Oldest Result Publication Year	Breakthrough and Humans Results	Oldest Result Publication Year
PubMed	19,139	1946	11,203	1947
CINAHL	3,446	1962	0	n/a
Google Scholar	1,460,000	n/a	524,000	n/a

There are many competing terms to breakthrough in the healthcare context which include (a) incident, (b) episodic, (c) acute, or (d) rescue. The primary competing concept to BTP which was selected to discuss further was incidental pain. Incidental has been identified in the practice environment as a term that is used interchangeably with breakthrough when describing pain, and differences between the two terms are unclear. Finding a definition of incidental for inclusion in this analysis was challenging since eight varying definitions were discovered across three online dictionaries. The definition most fitting to the healthcare context was selected as most appropriate for this analysis. Based on the Random House Dictionary, Merriam-Webster.com defines incidental as something incurred casually and in addition to the regular or main amount. Incidental pain is relevant as it is commonly used when discussing pain in patients with malignancy. The Edmonton Classification System

(ECS) was introduced in 1989 as a prognostic indicator for the management of pain. The ECS was revised in 2005, termed the Revised Edmonton Classification System (RECS), and then later the Edmonton Classification System for Cancer Pain, ECS-CP. The components of the ECS-CP are: (a) mechanism of pain, (b) incident pain, (c) psychological distress, (d) addictive behavior, and (e) cognitive function [8].

The ECS-CP seemingly places a clear boundary for the use of incidental to describe pain. Incidental is utilized in healthcare to describe a finding of clinical significance unrelated to the reasoning that prompted evaluation [9]. For illustration, there can be incidental findings of malignancy on radiographic imaging in patients that may simply present with shortness of breath, where imaging was ordered to rule out pneumonia. In 1994, the University of Oxford released a publication where breakthrough and incident were used synonymously without clear

barriers. “Breakthrough pain is the term used to describe pains that break through an existing analgesic regimen, which is not same as the incidental pain” [10].

It can be argued that the concept of breakthrough is still not focused primarily on utility in healthcare exclusively. In 2019 a film, Breakthrough, was released with the plot keywords of (a) faith, (b) drown, and (c) pastor, as identified by the Internet Movie Database, www.imdb.com. In the film, a major character unpredictably survives an accident which leads to the character re-evaluating and changing lifestyle choices. Breakthrough is used in the entertainment industry through this film to detail breaking through circumstances by means of survival.

In the business school context, breakthrough has been operationalized with six principles that can assist students in developing a successful company. These characteristics, described by Markides (1999) [11], include (a) generating many options, (b) choosing a unique position, (c) making clear choices, (d) choices creating a mosaic, (e) fitting the environment with flexibility, and (f) allocating appropriate organizational support for the mosaic. The breakthrough becomes a result of developing a strategy that is unique in comparison to competitors, which is also successful. The business environment initially started to utilize breakthrough to describe recoveries from financial hardships as early as the mid-1980s [11].

The application of Markides’s principles of breakthrough has clinical relevance in the hospital setting. Each of the six principles can be revised to apply or describe an ideal setting where patients that are experiencing BTP can achieve a desirable outcome of reduced pain. The success in controlling the patient’s pain is a direct analogy to achieving financial success for a business operation (see Table 2).

**Table 2:** The Relationship of Breakthrough Strategy to Pain Management.

Markides’s Breakthrough Strategy	Application of Strategy to Pain Management
Generating many options	Analyzing and evaluating the causes of pain in the hospitalized patient (forming a differential)
Choosing a unique position	Creating an analgesic plan considering, (a) the patient’s baseline use of opioids and (b) the differential diagnosis
Making clear choices	Describing a firm plan to the patient and care team with clear interventions and goals
Choices creating a mosaic	Describes a synergistic effect between the patient, providers, and nurses
Fitting the environment with flexibility	Understanding that the plan can be modified as needed if the clinical course is not as expected
Allocating organizational support	Hospitals investing in the education and implementation of plans for managing breakthrough pain in chronic opioid users; similar to the rollout of a new protocol

To provide context of the use of breakthrough (excluding pain), the term is currently utilized in the educational setting to describe student academic achievements. The Association for Supervision and Curriculum Development (ASCD) adapted a text The Better Writing Breakthrough in 2016 to provide teachers with strategies to inspire struggling readers and writers. There are three major characteristics of books that determine the classification of a student’s reading level. If a student can master the (a) meaning changes, (b) structure changes, and (c) the visual changes of books within a level, they can progress. The title’s foreword described the breakthrough as “students that are flush with both new thoughts and new language with which to express those thoughts” [12].

The most important difference with the utility of breakthrough in the context of pain management is that breakthrough pain is not desirable. Unlike academic or business breakthrough, which is desirable, breakthrough pain is not. In practice, interventions are implemented in attempts to reduce the occurrence of pain, to assist the patient in coping with the pain, or to help assist the patient in setting realistic goals for tolerable levels of pain. To refine the concept of breakthrough for utility in pain management, it should be clearly noted that the occurrence of breakthrough is neither desirable nor wanted. This dramatically contrasts with other contextual uses of breakthrough, where business or student development is exemplified by instances of breakthrough. If a student or business achieves many breakthroughs, they may be viewed as highly successful. If a patient has many instances of BTP, their healthcare team may be viewed as highly unsuccessful.

Be mindful that this analysis is only applicable to breakthrough used in the English language, as the ability to translate the term breakthrough from English into other languages is limited. This is challenging especially with Latin languages, such as in Portuguese where “episodic pain” was unsuccessfully used, and in Italian, where there isn’t a direct equivalent term for breakthrough [13].

**Defining attributes**

Given the subjective nature of pain, patient perception is a critical element for discussing and understanding attributes for breakthrough pain. Nurses and providers may have insight and even empathize with their patients, but they are not the individuals directly seeking treatment or experiencing the phenomenon. In 1999, a survey of 164 patients revealed that BTP was described as (a) unpredictable, (b) usually located at a site of prior BTP episodes, (c) requires increased use of opioids, (d) associated with a decrease in functional activity, and (e) associated with a disturbance in affect [14]. Twenty years later, in 2019, a similar analysis of 72 patients and 665 instances of BTP was published with similar findings as described in 1999. This 2019 study found that breakthrough pain: (a) had a mean duration of 30 minutes, (b) was relieved by medications, (c) was unpredictable, and (d) had a negative impact on quality of life [15].

In addition to patient surveys about BTP, 58 international research articles involving human subjects were also reviewed in an attempt to understand other closely related concepts such as chronic pain, pain, and acute pain. This review has led to conclusions about the attributes of BTP which is congruent with previous research. It is important to not limit the defining attributes of BTP since the symptoms, etiology, and manifestations can vary widely from one patient to another. Many studies about BTP have also exclusively involved patients with malignancy as

a requirement for inclusion. However, cancer patients are not the only patient population that experiences BTP, and thus attributes of BTP must be careful to allow for inclusions of all patient populations. Based on a review of the current literature, the essential attributes of BTP are best defined as: (a) increased pain, (b) unpredictable occurrences of pain, (c) pain that reduces functioning, and (d) need for intervention to relieve the pain. Expressed with further detail, the attributes are:

Pain that occurs in addition to a baseline level of pain, often occurring intermittently.

An increase in pain that is usually unpredictable, often lasting less than 30 minutes (though can be recurring).

Pain that negatively affects quality of life, including physical and psychological functioning.

Pain that requires additional intervention than what is used at baseline for alleviation, usually with the use of analgesics such as opioids.

Caution needs to be exercised with describing BTP so that attributes of the concept of pain or baseline pain are not defined instead. Attempts were made to avoid overlapping characteristics of BTP and pain when defining the concept, which included: (a) unpleasant, (b) uncomfortable, (c) noxious, (d) subjective, (e) distressing, (f) threat of injury, or (g) protective mechanism. It must also be acknowledged that any subcategory of pain and BTP can find some degree of commonality with attributes of BTP. While breakthrough can be clearly defined in contrast to a non-healthcare context, it may be impossible to consistently differentiate BTP from other types of pain due to unavoidable shared characteristics. Specific consequences such as: (a) lowered mood, (b) sleep disorders, (c) disrupted relationships, and (d) loss of life enjoyment have been studied as exemplars of reduced physical and psychological functioning; though these consequences can also be found with many types of pain [15].

### Case construction

The now discontinued LSP Journal (Language for Special Purposes) of Denmark provided a comparative study of the various methods of concept analysis. The Walker and Avant (2018) [16] concept analysis model is presented in a concise step-by-step guide that details each of the eight steps required for concept analysis. Steps five and six include the construction of cases that provide clarification on the attributes of the concept. There are six possible cases which include: (a) model, (b) borderline, (c) related, (d) contrary, (e) invented, and (f) illegitimate. The model case includes all the attributes of the concepts. Each additional case is not routinely included in publications involving nursing sciences. The rationale for this may include word count limitations, or the inability to clearly define the attributes without overlapping characteristics of the concept. The intention of providing additional cases is to reduce contradictions between the model case and the defining attributes, as not all attributes will be the best fit for the concept. In addition to the model case, this analysis will detail three additional cases to assist in justifying the attributes of BTP. A borderline case will define most of the attributes of the concept, a related case will show similarities to the model case, but are not them, and the contrary case will show an instance of what the concept is not. All cases will include false patient names and demographics of real-life scenarios encountered in clinical practice.

### Model case

Mr. Collin is a 65-year-old male who is admitted to the emergency room for further evaluation of lower back pain. Mr. Collin has a known history of chronic back pain with a history of lumbar and cervical spine fusions greater than 11 years ago. The patient reports that he is no longer a candidate for interventional procedures to alleviate his pain, and that his pain is typically adequately managed with opioids, including long acting morphine tablets, and oxycodone taken as needed. Despite using his baseline analgesics, Mr. Collin does not achieve analgesia at home and is ultimately admitted to his local hospital for further evaluation. He describes the pain as "different" from his baseline pain, and reports that the pain is sporadic and unpredictable. The patient required transport by ambulance from his home because he was unable to endure walking or driving his car. Radiographic imaging reveals lumbar vertebral inflammatory changes. The patient reports, after admission, that he was involved in a motor vehicle collision, and the BTP and inflammatory changes are suspected to be aggravated by his recent collision. He is placed on anti-inflammatory medication, dexamethasone, in addition to having his baseline use of opioids resumed. The patient is ultimately discharged to a rehab facility four days later for continued physical therapy and re-training for completing basic activities of daily living.

This model case details all four defining attributes of BTP. The patient has an unpredictable increase in baseline pain. This pain further affected his quality of life and ultimately required additional intervention.

### Borderline case

Ms. Watts is a 35-year-old female with a known history of metastatic pancreatic cancer. She is hospitalized for further treatment and evaluation of shortness of breath and left sided chest pain. She is found to have a repeat occurrence of a malignant pleural effusion. The patient has generalized pelvic and chest pain at baseline which is managed by using over-the-counter analgesics as an outpatient. The pulmonary team drains the patient's effusion but is concerned about the patient's pain and consults the pain management team. Upon consultation, the patient reports higher pain than usual since a drain catheter was placed to her chest but reports that she should be "fine" without additional medication. Since the patient has a legitimate source of pain, she is prescribed a low dose opioid for management of any possible BTP. A 48-hour review of the patient's medicine administration record shows that she has not utilized any opioids, but the order is not discontinued.

In this scenario the patient has a functional decrease due to shortness of breath and pain, she also has a baseline level of pain due to malignancy. The patient has an increase in pain; however, this increase in pain is predictable and the patient does not require additional analgesics. There was anticipation in this scenario, where the patient was predicted to have BTP and a treatment plan was established, though the patient did not require use of the additional intervention (prescribed opioids).

### Related case

Mr. Charles is a 40-year-old male admitted to the hospital after his daughter found him unconscious at home. The patient was found to be in diabetic ketoacidosis on admission and it was realized by family members that the patient is not compliant with his diabetes medications. The patient uses gabapen-



tin chronically for the management of diabetic neuropathy for chronic bilateral lower extremity pain. Several days later into the patient's admission he progressively develops symptoms of sepsis with a suspected source from a foot wound. The foot wound was inflicted prior to admission, when the patient fell at home. There is suspicion the patient may need to have an amputation if intravenous antibiotics do not correct his symptoms of sepsis. The patient increasingly starts to have a flat affect with staff members. He frequently reports "feeling miserable" and is anxious about losing his foot. Eventually, the psychiatric team is consulted as the patient is found to be suffering from depression and anxiety. The patient was found to have ineffective coping with having to take insulin for diabetes management, and the likely possibility of needing an amputation.

In this case, the patient had an alteration in his daily functioning due to his diabetes, not BTP. He required additional intervention for the management of his diabetes and symptoms of depression and anxiety. His depression and anxiety were initially unpredictable, though he did not require increases in the doses of his analgesics. His pain remained controlled throughout his admission with gabapentin and his affect improved as he talked about his feelings with the psychiatric team (psychotherapy).

#### Contrary case

Ms. Jane is a 24-year-old female admitted for further evaluation of nausea, vomiting, and abdominal pain. In the emergency department, the patient requested intravenous opioids for severe pain, though physical exam and radiographic imaging did not reveal any acute findings. A urine drug screen reveals positive findings for cocaine, amphetamines, and opiates. Upon discussing the results with the patient, she admits to intravenous cocaine, heroin, and fentanyl abuse. She becomes verbally aggressive towards the healthcare workers, and she reports she is "withdrawing." The psychiatric and pain management teams are consulted for further treatment and evaluation. Given the patient's illicit use of intravenous fentanyl, the patient is started on low dose oral opioids to prevent withdrawal.

In this scenario, the patient requires the use of opioids though she does not have a chronic condition that rationalizes chronic pain. There are similarities to the model case since the patient is prescribed doses of opioids, though she does not meet the criteria of having BTP and instead is found to have a substance abuse disorder.

#### Antecedents

For BTP to occur, there must first be an implied understanding that a patient's chronic pain is well controlled. There is then a disruption in this baseline level of control which leads to the occurrence of BTP. For illustration, and ease of understanding, consider the occurrence of breakthrough seizures. "When an epilepsy patient experiences a sustained period of freedom from seizures (seizure control), then suddenly experiences a seizure, such an event is commonly referred to as a breakthrough seizure" [16]. Patients may experience episodes of BTP for an undefined amount of time, but initially, there needs to be an assumption that the patient was previously managing pain that was not associated with BTP. A panel of 12 pain management experts across the United States developed a Consensus Panel Recommendation for the assessment and management of BTP, citing that baseline pain must be stable before BTP can be present, as unstable baseline pain is managed differently than BTP

[17]. Additional antecedents of BTP are numerous and our exemplars are not intended to be complete given limitations in our own experience and inability to analyze a finite amount of currently available literature. Even at the time of this writing, there may be active studies attempting to analyze the characteristics of BTP.

Like this concept analysis, the 2005 Consensus Panel Recommendations for the Assessment and Management of Breakthrough Pain described BTP throughout their literature with the illustration of several patient case studies [18]. A review of these case studies, along with the review of other guidelines aimed at the management of chronic pain assisted in the formulation of the antecedents of BTP. Antecedents that precipitate BTP could include: (a) non-compliance with an established pain control regimen; (b) patient or provider attempts to decrease current utilization of opioids; (c) progression of a chronic disease that is believed to be the source of the pain, such as metastatic carcinomas or worsening diabetes; (d) the diagnosis of a new chronic condition in addition to known chronic diseases, such as developing arthritis in addition to having known sickle cell anemia; or (e) aggravation of a chronic condition for known or unknown (idiopathic) reasons, such as an arthritis patient moving from the warm climate of Florida to the cold climate of Minnesota. In the traditional sense, an antecedent of BTP is too numerous to define with limitation and can be any circumstance that causes a physiologic response in the patient.

#### Consequences

The consequences of untreated BTP are often negative. There is no single universally accepted consequence of BTP, rather there are several possibilities based on the severity of the BTP since every patient will not experience or cope with BTP the same way.

One significant consequence of BTP is the utilization of Emergency Departments (EDs) for alleviation of symptoms. In 2016, at least one-third of ED visits were for a primary complaint of pain where an opioid was prescribed or given in patients older than 18 years of age. The percentage was higher at 43.8% for patients aged 45-64 [19].

Patients that seek treatment for their BTP often reach the consequence, or result, of a multi-modal pain management plan developed by their provider in attempts to manage the attributes of BTP, such as functional limitation and pain intensity. The need for assessment and re-assessment is also a result of BTP to ensure that the multi-modal pain management plan is effective, or that goals and agreements are discussed when modifying the treatment plan. There are various tools available for assessing, classifying, and predicting pain; though the instrument chosen is not of importance. It is important that any assessment is a result of the occurrence of BTP which may simultaneously help to formulate the plan [19].

The consequences of BTP are only discussed with patients who seek the care of a healthcare professional, as data from these visits can be objectively analyzed. Consider the patient who experiences BTP but does not seek care from a healthcare professional. The rationale for this may also be numerous, including (a) lack of medical insurance, (b) distrust in health care, (c) cultural norms of coping, or (d) illicit self-treatments. These patients may inadequately or excessively report their pain, consequently leading to worsened pain or unintentional illicit drug overdoses (justifying the need for pain management spe-

cialists). For these reasons, the consequences of BTP cannot be entirely discussed prior to the point that a patient seeks care (see Figure 1).

Antecedents	Attributes	Consequences
Medical non-compliance	Increased and unpredictable pain	Increased utilization of healthcare
Decreased utilization of analgesics	Impaired functional ability	Decreased functioning from baseline
Progression/aggravation of a chronic/acute disease	Intervention to relieve the pain	Revised analgesic regimen

**Figure 1:** Breakthrough pain: Examples of antecedents, attributes, and consequences.

### Empirical referents

The empirical referents are aimed at proving the existence of BTP and can be identified by reviewing the previously mentioned attributes of BTP. The most common and easiest observation of BTP is through the patient experience, where the patient reports pain that is more severe than their baseline. Of course, as providers, a complete physical exam and history must be obtained to rule out any obscure motives, such as drug seeking behaviors. In the case of a reliable patient, a physical exam and history of the patient's pain and current BTP are likely to also find decreases in the patient's physical and psychological functioning. This can further be witnessed in the hospital setting through mobility evaluations completed by occupational and physical therapists. Physical functioning can be decreased where the patient may require assistive devices. Psychological deficits can be realized with a patient's reports of insomnia or visible withdrawn affect when interacting with the patient.

Clarifying the difference between empirical referents and consequences can be challenging. Those that challenge this analysis may argue that decreased psychological and physical functioning may be viewed as a consequence of BTP. Though, BTP and these referents are occurring concurrently, in the interim, while assessments and treatment plans are being developed. The true consequence is the process of establishing a revised treatment plan through assessing and re-assessing the patient. If the revised plan is effective, the BTP will ideally be resolved, also leading to a resolution of the attributes and referents of BTP. However, the true consequence, the revised plan, will remain in place indefinitely based on the etiology and other findings that may have precipitated the BTP initially.

Since the scope and definition of BTP are not intended to focus on a specific diagnosis or disease process, the empirical referents can also be numerous and cannot be exhaustively described. Other considerations for empirical referents can include changes in vital signs, such as tachycardia, hypertension, and tachypnea. However, there needs to be caution in using vital signs as an absolute empirical referent or attribute given the low specificity to pain and broad applicability to other comorbidities. Worsening, intermittent, and unpredictable pain can sometimes be proven as a real phenomenon with specific disease processes. For example, radiographic imaging showing severe spinal stenosis, or laboratory data showing significantly increased reticulocyte counts can often verify the existence of worsening, intermittent, and unpredictable pain. However, these types of referents are highly specific to the correlated underlying disease process and cannot be broadly applied to the

concept of general BTP. Simply stating that abnormal laboratory or radiographic imaging is an empirical referent for BTP does not offer any beneficial use or clarification because of the ambiguous meanings of abnormal and the variety of testing available. It also does not provide any insight for nurses or healthcare providers who are in the initial triage phase of assessing the patient with suspected BTP. How would providers know which tests to order or how aggressive to be with the work-up?.

### Conclusions

This analysis set out to describe the historical and current utilization of the concept breakthrough. The primary population focus involves a healthcare setting, as further research will aim to improve advanced practice nursing processes. However, breakthrough was examined outside of the healthcare setting in two intentionally contrasting environments (business and education) to understand contributions and limitations of its uses within those contexts. The study of chronic pain and BTP are important, most noticeably because of the financial impact in the United States. In 2012, it was estimated that up to \$635 billion is spent annually for direct treatment and lost productivity associated with the pain (Mills et al., 2016). Further research needs to be focused on the patient experience of BTP, which includes their understanding of the dangers of opioids. Current guidelines are placing an emphasis on prioritizing functional goals instead of symptom relief in attempts to minimize opioid related adverse [20].

The authors have spent numerous hours attempting to find guidelines for the use of opioids for various indications, including competing terms previously discussed. It is possible that important publications may be lost or less discoverable by users that are seeking the information, given the ambiguous nature of describing pain. If breakthrough is adopted for use as the only term to describe the pain experienced by patients who are also chronic opioid users, then the ability to disseminate research to a larger audience would be easier to facilitate. Given the collaborative approach to the intervention for the treatment of chronic pain, research is also being utilized by roles such as pharmacists and physical therapists, further reinforcing the need for ease of access to research [21]. Alternatively, if BTP is not adopted as the universal term, this analysis demonstrates the importance of coming to a consensus about describing pain. The authors encourage other pain specialists to either defend their use of BTP to reinforce this analysis, or to present an analysis on a competing term to expose further limitations and clarify boundaries for the description and understanding of BTP pain.

### Acknowledgements

Thank you to the professors and committee members at Augusta University who provided feedback towards the development of this manuscript. They include Dr. Cynthia Chernecky, Dr. Julie Zadinsky, research manager, Chelsey Lemons and grant specialist, Keith Williams.

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