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Cancer pain assessment – Can we predict the need for specialist input?

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ABSTRACT

We can anticipate that failure to assess cancer pain adequately will inevitably lead to inappropriate application of pain management options. However, it is not always standard practice to teach the limitations of the question 'How bad is the pain?', as well as the need to consider what may complicate pain management or be a poor prognostic factor for pain control. These issues may complicate cancer pain assessment and require specialist consultation. An internationally accepted classification system for cancer pain could provide the basis for a multidimensional assessment and a common language for clinical and research work. Research dating back to the late 1980s has resulted in the development of the Edmonton Classification System for Cancer Pain. This includes many of the factors that may be prognostic for the complexity of cancer pain management and can assist an inexperienced clinician in anticipating the need for specialist advice.

1. Introduction

It can be argued with some conviction that regardless of a clinician's comprehensive understanding of pharmacological and non-pharmacological pain management,[1] this knowledge is of little value if the assessment is inaccurate in understanding fully the physiological and non-physiological mechanisms underlying the patient's presentation of a pain syndrome.[2] We can anticipate that failure to assess the pain adequately would lead inevitably to inappropriate application of the pain management options.

In educating health care professionals, the current standard approach to the initial assessment of cancer pain[2,3] includes a detailed history and physical examination, assessment of relevant psychosocial issues and a diagnostic work-up determined by the circumstances of the initial evaluation. In developing an approach to the assessment, it is generally taught that it is important to consider what may be causing the pain, as well as to ask about the pain intensity. However, it is not always standard practice to teach the limitations of the question 'How bad is the pain?', as well as the need to consider what may complicate pain management or be a poor prognostic factor for pain control. These issues may complicate cancer pain assessment and be at the root of the need to request specialist support.

2. How bad is the pain?

It has often been stated that one of the major barriers to pain management is the failure to ask patients whether they are experiencing pain and obtain some measure of pain intensity (PI).[2–4] It has been recommended that a useful approach would be to use either a visual analogue scale or a numerical scale (Fig. 1). In assessing PI, the question can be phrased as to pain at the present moment, worst PI in the last 24 h, lowest PI in the last 24 h, or average PI over the last 24 h. In the absence of a clearly worded question, the clinician will not know which of these options the patient may be using in framing a reply.

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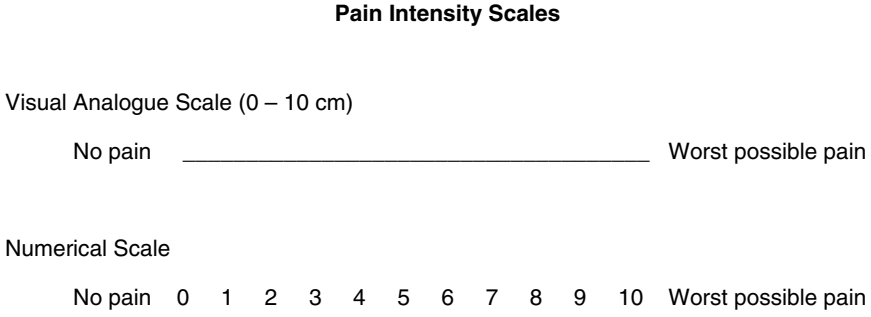

Fig. 1 – Pain Intensity Scales.

It is also vital to remember that this simple approach is by definition a one-dimensional, not a multidimensional, assessment. Some patients may be very good at providing an accurate physiological description associated with their PI, but this will not be the case for every patient. This can be illustrated by considering a 60-year-old woman with breast cancer with bone metastases who states that the pain is 8 on a scale of 0–10. What she might mean is 'My leg really hurts where I have bone metastases, I need better pain management.' However, another patient with a similar diagnosis stating a PI of 8/10 might mean 'My leg hurts a bit, but I feel terrible about my situation and cannot cope with anything. I am having difficulty expressing my suffering other than through my pain?'

The complexity of the pain experience was described by Tolstoy in *The Death of Ivan IIyich* in the following sentence: *'It was true, as the doctor said that Ivan Ilyich's physical sufferings were terrible, but worse than the physical sufferings were his mental sufferings, which were his chief torture.'* Many reports on cancer pain management have reported that pain is often managed inadequately because we do not listen to the patient's complaint of pain, as well as the reluctance of some physicians to prescribe adequate amounts of opioids. However, we need to remember that although we should certainly believe that 'pain is what the patient says it is', this does not necessarily provide a guarantee that every patient's complaint of pain is only about the physiological mechanism and will always respond simply to an increase in pharmacological management.[2]

3. What may complicate pain management?

We live in an era in which patients and their families often read in the media that they should expect adequate pharmacological management to provide relief for all cancer pain. If we are aware of poor prognostic or complicating factors, then we may be able to lower expectations of success from pharmacological management alone, suggest alternative approaches and be better prepared to predict the need to request specialist consultation.

Consider the following two examples[5]:

(1) A 65-year-old woman with breast cancer and metastases to the thoracic and lumbar spine along with right femur complains of a dull almost constant pain in the right upper leg and lower back. She reports that the steady pain sometimes wakes her at night. She finds that although initially when she stands up there might be a slight increase in the back pain, this has not limited her mobility. She has been married for 40 years and has no history of anxiety or depression. She also has no history of drug or alcohol abuse. You note during the examination that she can move without any evidence of pain. There is some tenderness to palpation over the lower back. She is able to give a clear history, and a formal cognitive assessment confirms that she has no cognitive deficits.

(2) A 65-year-old woman with colon cancer has intra-abdominal metastatic disease, as well metastatic disease to the C4 and C5 area. She complains of constant pain in the neck area, which she rates as 3/10. In addition, there is marked shooting stabbing pain going down the left shoulder and arm which she describes as 8/10. She notes that whenever she attempts to move her head, the pain increases in severity to 10/10 and causes her extreme distress. The patient has been married and divorced three times and lives on her own in a second floor apartment without an elevator. Over the last few years, she has been managed for anxiety and depression with a variety of benzodiazepines and antidepressants. She acknowledges that in her teens and twenties she used intravenous drugs intermittently. Subsequent to that time, she has continued to drink heavily. She acknowledges that her intermittent heavy alcohol consumption has continued up to the present. You note inconsistencies in the patient's history and that although she complains of unrelenting pain that limits her mobility, she has been noted to walk independently out of the institution when she has needed to smoke. During the examination you note that she is drowsy and is only able to score 15/30 on the Mini-Mental State Examination, with a normal expected score of 24 for her age and educational level. There is tenderness to palpation over the cervical spine with increased sensitivity and discomfort with light touch over the left shoulder and arm.

In the first case, the patient appears to have a nociceptive pain syndrome that is well controlled. She has a history that suggests she has coped well with the stress of life and work. However, in the second case, the patient appears to have a neuropathic pain with a marked incident component. In addi-

tion, there is difficulty in obtaining an accurate pain history due to the cognitive deficits, and a history suggesting that she may not have the ability to cope well with the stress of her present situation (Appendix 1).

As we evaluate the multidimensional aspects of pain assessment, it is helpful to consider the following three steps[6]:

1. Production.
2. Perception.
3. Expression.

The production of the pain occurs at the site of injury and we do not have the ability to measure this directly at the bedside. The perception of pain occurs in the central nervous system and brain, and again in the clinical setting this cannot be measured. The expression of the PI is the main target of our assessment and management. It is important to understand that individual patients with similar injury may express different degrees of PI requiring consideration of the multiple dimensions that may impact on an individual's expression of pain. We need to recognise that cancer patients can develop syndromes that vary in complexity. While we can expect to achieve good pain management in the majority of cases, there are some patients with pain syndromes that may be more difficult to treat. The development of a standardised cancer pain assessment has the potential to assist us in anticipating and predicting more accurately which of these patients may require different interventions, more time to achieve stable pain control, along with more experienced pain or palliative care management consultation.

3.1. *A classification system for cancer pain*

Oncologists would not wish to discuss the outcome of treating cancer patients without some differentiation. The TNM Classification System for describing cancer populations has been a common language for oncology clinicians and researchers for many decades. However, a review of the cancer pain abstracts presented at the 2002 and 2005 International Association for the Study of Pain (IASP) conferences in San Diego and Sydney, respectively, illustrates that the standard is often merely to state the number of cancer patients with pain included in a study population. The absence of a standardised approach to cancer pain has exposed the limitations of comparing research results in cancer pain management.[7]

As noted in the preceding cases, there are a number of characteristics that may be associated with the need to seek specialist input in cancer pain assessment and management. These characteristics include neuropathic pain, breakthrough pain (incident and episodic pain), psychological distress, unknown pain syndromes, a history of substance use disorders, tolerance, predisposition to side-effects, genetic factors, age and the presence of delirium.[8] The development of a pain classification system is complicated by all of these factors. Some classification systems have focused on specific aspects. IASP has developed a classification of cancer pain that consists essentially of a catalogue of lesions and diseases that may cause pain.[9] Although these provide important information, it is not linked to any prediction of complexity for pain management. Other systems have focused on pain physiology and the mechanism of the cancer pain syndrome.[10] Another system used a pharmacological approach and the use of medications to determine cancer pain physiology and the subsequent effectiveness of drug treatment regimens.[11] Hwang et al.[12] developed a cancer pain prognostic scale which calls for multiple assessments to predict the likelihood of pain relief within two weeks for cancer patients reporting moderate to severe pain. However, this comprehensive cancer pain assessment is a complex model that would make everyday clinical use problematic.

3.2. *Development of the Edmonton Classification System for cancer pain (ECS-CP)*

The work of our group to develop a more standardised classification of cancer pain dates back to the 1980s, when Bruera and colleagues recognised the value of the TNM system to oncologists.[13] Extrapolating the TNM principles to cancer pain classification, Bruera et al. developed the Edmonton Staging System (ESS), which classified cancer pain on the basis of seven characteristics[14,15]:

- Mechanisms of Pain (visceral, bone or soft tissue, neuropathic, mixed, unknown).
- Incidental Pain (present or absent).
- Daily Opioid Use.
- Cognitive Function (impaired or normal).
- Psychological Distress (present or absent).
- Tolerance (absent or present according to an increase in average daily opioid consumption of more than 5% over the first three weeks of follow-up); and a
- Past History of Alcoholism or Drug Addiction (positive or negative).

Patients were defined as having good, intermittent or poor prognosis for pain control, based on a combination of these features.

Subsequently, the ESS has been used in a number of reports, where it was demonstrated to be useful in providing more information with regard to the cancer pain syndromes of the reported research population.[16–21] However, clinical experience in our own setting has consistently created some difficulties with the definitions and the use of this system, which has limited the use and acceptance of the ESS on a wider scale. Problems include the fact that incidental pain, psychological distress and history of addiction can be controversial and hard to interpret. In addition, the tolerance calculation has been difficult to implement and impractical in some clinical situations. The terminology of good or poor prognosis has often been considered of little value when many of the so-called poor prognosis patients go on to achieve good pain control. This problem was confirmed by Hwang et al.'s study comparing the cancer pain prognostic scale with the ESS.[12] At three weeks, both predictive systems were found to have performed poorly.

Noting the limitations of the ESS, an expert panel consisting of physicians and researchers in our programme began the work on developing a revised Edmonton Staging System (rESS). The rESS was based on our extensive clinical experience with the use of the ESS, as well as the literature review. The major change was a reduction in the number of features from 7 to 5: mechanism of pain, incidental pain, psychological distress, addictive behaviour and cognitive function. Opioid dose was not included as it was considered more useful as an outcome measure, while tolerance was excluded due to the difficulty of including this variable in the initial assessment. The number of pain mechanism options was reduced to reflect the complexity of treating neuropathic pain over other pain mechanisms. New definitions were introduced for incidental pain, psychological distress, addictive behaviour and cognitive function with the understanding that this would require ongoing refinement and evolution.

3.3. *Research into a classification system for cancer pain*

Subsequent to the development of the rESS we have conducted three validation studies: a pilot study, a regional multicentre study, and a construct validation study using expert panels. We have also conducted two secondary data analyses of the regional multicentre study to assess the role of tolerance and PI as potential features for a classification system.

(1) *Pilot study*: The pilot study included 82 advanced cancer patients to determine patient accrual patterns, conduct power analysis calculations and refine data collection methods. The experience of this pilot study resulted in refinements of the research design for the subsequent regional multicentre study, as well as four of the five definitions. In addition, a category for 'No Pain Syndrome' was added to the mechanism of pain feature to avoid the possibility that an absent descriptor could be interpreted as a failure to complete a cancer pain assessment.

(2) *Regional multicentre study*[22]: The multicentre validation study included cancer patients in a Tertiary Palliative Care unit, acute care hospital and hospice palliative care unit settings within the province of Alberta. This study allowed us to obtain inter-rater reliability estimates as well as predictive validity evidence. The study included 746 patients, with 619 (83%) having a pain syndrome. Inter-rater reliability estimates ranged from 0.67 (pain mechanism) to 0.95 (presence of addiction). Using univariate Cox regression analysis, we were able to demonstrate that younger patients (<60 years), patients with neuropathic pain, incidental pain, psychological distress or co-morbid psychological distress and addiction required significantly more time to achieve stable pain control. In the multivariate Cox regression analysis, only age, neuropathic and incidental pain were associated significantly with the time needed to achieve stable pain control. Patients with neuropathic or incidental pain used significantly more modalities (pharmacological and non-pharmacological) to achieve stable pain control. A higher final mean morphine equivalent daily dose was required for patients with neuropathic and incidental pain and the presence of psychological distress or addiction.

(3) *Construct validation study using expert panels*[23]: Two expert panels, representing regional (Panel A, $n = 18$) and national/international (Panel B, $n = 52$) palliative medicine and pain specialists, were selected to participate in a modified Delphi survey. The majority of participants either agreed or strongly agreed to the inclusion of the five existing features in the pain classification system. The majority of participants suggested keeping the current definitions for these features with some revisions. Based on this feedback, definitions for incidental pain, psychological distress, addictive behaviour and cognitive function were revised, including the development of guidelines for use. The feature name for incidental pain was changed to incident pain, to better reflect its transient and intermittent nature. Participant feedback resulted in the inclusion of an 'unable to classify' option for each of the features. This required the separation of the psychological distress and the addictive pain features to improve clinical and analyses utility. Finally, to more accurately reflect the intended use as a classification system, the name of the instrument was changed from the rESS to the ECS-CP (Appendix 1).[5]

(4) *Tolerance*[24]: Tolerance or opioid dose escalation was included as a prognostic factor in the ESS but was excluded from the rESS due to difficulty defining and applying this concept. The purpose of this secondary analysis was to clarify the need for opioid dose escalation as a possible feature of the classification system. We hypothesised that younger age (<60 years), neuropathic pain, incident pain, psychological distress and addictive behaviour would be associated with an opioid escalation index percentage (OEI%) of more than 5%. There was no significant association between OEI% and age, neuropathic pain, incident pain, psychological distress or addictive behaviour. We concluded that the OEI% may over simplify the complexity of pain management and that we would require further work to better understand the possible use of the OEI% as a feature of a cancer pain classification system.

(5) *Pain intensity*[25]: PI on initial assessment has been proposed as having predictive value. We hypothesised that patients with moderate to severe cancer pain would take longer to achieve stable pain control, use higher opioid doses and require more complicated analgesic regimens than patients with mild cancer pain on initial assessment. A secondary data analysis of the rESS regional multicentre study was conducted to look at the associations between PI and time to stable pain control; final opioid dose and number of adjuvant modalities. PI on initial assessment was defined as mild (0–3), moderate (4–6) and severe (7–10). Patients with moderate and severe pain on initial assessment required significantly longer time to achieve stable pain control: median days were four (mild), nine (moderate) and 22 (severe). PI was a significant predictor in both the univariate and multivariate Cox regression

Table 1 – Potential poor prognostic factors

1	Younger patients
2	Neuropathic pain
3	Incident or episodic pain
4	Psychological distress potentially impacting increased expression of pain intensity
5	Substance use disorder potentially predicting inappropriate opioid use or tolerance to opioids
6	Cognitive impairment limiting accuracy of pain assessment or patient's ability to tolerate pharmacological management
7	Severe pain intensity on initial presentation

analyses. Patients with moderate to severe pain required significantly higher final opioid doses and more adjuvant modalities. It appears that PI on initial assessment is a significant predictor of the complexity of pain management and time to achieve stable pain control, and the incorporation of this feature into the ECS-CP requires further consideration.

4. Conclusion

We have attempted to illustrate the many factors that may be prognostic for complexity of cancer pain management and assist an inexperienced clinician in anticipating the need for specialist advice. The ESC-CP is an attempt to integrate these factors into a cohesive framework, using standardised definitions and terminology. At this point, the items included represent initial attempts to define a 'standard core' of variables, and additional items such as tolerance, pain intensity and age should be included in further research. It is important to acknowledge that inevitably the clinical practice and social and cultural circumstances of our environment have influenced the creation of the ESC-CP and may limit the generalisability of all of these findings in other settings. We are presently conducting an international multicentre validation study, using the refined definitions in a diverse international sample of palliative cancer pain patients.

At the present time, we have no internationally accepted assessment to help us determine which cancer pain syndromes may be more difficult or time consuming to manage. The consideration of potential poor prognostic factors in the initial cancer pain assessment should be included in cancer pain education (Table 1). We believe that a standardised, comprehensive and simple classification system for cancer pain would enable clinicians to better manage patients and predict the need for specialist support.

Conflict of interest statement

None declared.

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Appendix 1. Edmonton Classification System for Cancer Pain

For each of the following features, circle the response that is most appropriate, based on your clinical assessment of the patient.

1. *Mechanism of Pain*
   - No – No pain syndrome.
   - Nc – Any nociceptive combination of visceral and/or bone or soft tissue pain.
   - Ne – Neuropathic pain with or without any combination of nociceptive pain.
   - Nx – Insufficient information to classify.
2. *Incident Pain*
   - Io – No incident pain.
   - Ii – Incident pain present.
   - Ix – Insufficient information to classify.
3. *Psychological Distress*
   - Po – No psychological distress.
   - Pp – Psychological distress present.
   - Px – Insufficient information to classify.
4. *Addictive Behaviour*
   - Ao – No addictive behaviour.
   - Aa – Addictive behaviour present.
   - Ax – Insufficient information to classify.
5. *Cognitive Function*
   - Co – No impairment. Patient able to provide accurate present and past pain history unimpaired.
   - Ci – Partial impairment. Sufficient impairment to affect patient's ability to provide accurate present and/or past history.
   - Cu – Total impairment. Patient unresponsive, delirious or demented to the stage of being unable to provide any present and past pain history.
   - Cx – Insufficient information to classify.

Examples:

Case 1 – NcIoPoAoCo.
Case 2 – NeIiPpAaCi.

REFERENCES

1. Cherny NI. The pharmacologic management of cancer pain. *Oncology* 2004;**18**(12):1499–524.
2. Thomas JR, von Gunten CF. Pain in terminally ill patients. Guidelines for pharmacological management. *CNS Drugs* 2003;**17**:621–31.
3. Gordon DB, Dahl JL, Miaskowski C, et al. American pain society recommendations for improving the quality of acute and cancer pain management. *Arch Intern Med* 2005;**165**:1574–80.

4. Fine PG, Miaskowski C, Paice JA. Meeting the challenges in cancer pain management. *J Support Oncol* 2004;**2**(Suppl. 4): 5–22.
5. Fainsinger RL, Nekolaichuk CL, Lawlor PG, Neumann CM. Edmonton classification system for cancer pain (ECS-CP). <http://www.palliative.org/PC/Clinicalinfo/AssessmentToolsIDX.html>.
6. Vignaroli E, Bruera E. Multidimensional assessment in palliative care. In: Bruera E, Higginson IJ, Ripamonti C, von Gunten C, editors. *Textbook of palliative medicine*. Hodder Arnold; 2006. p. 319–32.
7. Boisvert M, Cohen SR. Opioid use in advanced malignant disease: why do different centres use vastly different doses? A plea for standardized reporting. *J Pain Symptom Manage* 1995;**10**:632–8.
8. Fainsinger RL, Nekolaichuk CL. A "TNM" system for evaluating and treating cancer pain. The Edmonton classification system. *Oncol Exchange* 2005;**5**(4):14–7.
9. Caraceni A, Portenoy RK. An international survey of cancer pain characteristics and syndromes. IASP task force on cancer pain. International association for the study of pain. *Pain* 1999;**82**:263–74.
10. Woolf CJ, Decosterd I. Implications of recent advances in the understanding of pain pathophysiology for the assessment of pain in patients. *Pain* 1999(Suppl. 6):S141–7.
11. Arner S. Pain analysis in prediction of treatment outcome. *Acta Anaesth Scand* 1998(Suppl. 113):24–8.
12. Hwang SS, Chang VT, Fairclough DL, et al. Development of a cancer pain prognostic scale. *J Pain Symptom Manage* 2002;**24**(4):366–78.
13. Piccirillo OJ, Feinstein A. Clinical symptoms and co-morbidity: significance for the prognostic classification of cancer. *Cancer* 1996;**77**:834–42.
14. Bruera E, Macmillan K, Hanson J, MacDonald RN. The Edmonton staging system for cancer pain: preliminary report. *Pain* 1989;**37**:203–9.
15. Bruera E, Schoeller T, Wenk R, et al. A prospective multicentre assessment of the Edmonton staging system for cancer pain. *J Pain Symptom Manage* 1995;**10**:348–55.
16. Bruera E, Fainsinger R, Spachynski H, et al. Clinical efficacy and safety of a novel controlled-release morphine suppository and subcutaneous morphine in cancer pain: a randomized evaluation. *J Clin Oncol* 1995;**13**:1520–7.
17. Bruera E, Sloan P, Mount B, et al. A randomized, double-blind, double-dummy, crossover trial comparing the safety and efficacy of oral sustained-release hydromorphone with immediate-release hydromorphone in patients with cancer pain. Canadian Palliative Care Clinical Trials Group. *J Clin Oncol* 1996;**14**:1713–7.
18. Bruera E, Watanabe S, Fainsinger RL, et al. Custom-made capsules and suppositories of methadone for patients on high-dose opioids for cancer pain. *Pain* 1995;**62**:141–6.
19. De Stoutz ND, Bruera E, Suarez-Almazor M. Opioid rotation for toxicity reduction in terminal cancer patients. *J Pain Symptom Manage* 1995;**10**:378–84.
20. Ernst DS, Brasher P, Hagen N, et al. A randomized, controlled trial of intravenous clodronate in patients with metastatic bone disease and pain. *J Pain Symptom Manage* 1997;**13**:319–26.
21. Fainsinger RL, Toro R. Opioids, confusion in opioid rotation. *Palliative Med* 1998;**12**:463–4.
22. Fainsinger RL, Nekolaichuk CL, Lawlor PG, Neumann CM, Hanson J, Vigano A. A multicentre validation study of the Revised Edmonton Staging System for classifying cancer pain in advanced cancer patients. *J Pain Symptom Manage* 2005;**29**:224–37.
23. Nekolaichuk C, Fainsinger R, Lawlor P. A validation study of a pain classification system for advanced cancer patients using content experts: the Edmonton classification system for cancer pain. *Palliative Med* 2005;**19**(6):466–76.
24. Lowe S, Nekolaichuk C, Fainsinger R, Lawlor P. Should the rate of opioid dose escalation be included as a factor in a Cancer Pain Classification System? *J Pain Symptom Manage* 2008;**35**(1):51–7.
25. Fainsinger RL, Lowe S, Nekolaichuk C, Lawlor P. Is pain intensity predictive for complexity of Cancer Pain? *Palliative Med* 2006;**20**(3):269.