

Using Objective Signs of Severe Pain to Guide Opioid Prescribing



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Release Date: **June 2008**

A Commonsense Diagnostic Approach

It is often said that pain treatment must be guided only by subjective perceptions of the patient and that pain itself cannot be objectively assessed. This belief is only partially correct.

It is clearly humane to ask patients about their pain perceptions and to grade their pain on the standard 1-to-10 scale. However, the practitioner who must separate relief-seekers from drug-seekers when prescribing potent opioid analgesics needs to use objective measures to accomplish this critical task.

The diagnostic approach proposed here entails commonsense medical practice. The fact is that severe, uncontrolled pain usually produces more objective physical evidence of its presence than does the average case of diabetes or coronary artery disease.

Pain is a potent stressor that activates the entire sympathetic nervous system and the hypothalamus-pituitary-adrenal axis to produce high serum levels of catecholamines and glucocorticoids.¹⁻⁶ Since this is a physiologic reaction, some simple objective measures of adrenal and sympathetic responses, including pulse rate, blood pressure, and pupil size are easy to assess.

The practitioner also should perform an examination to evaluate if the pain is uncontrolled, as well as to determine if severe pain has been present for an extended period of time. For example, severe, chronic pain may cause an afflicted person to find physical positioning relief and avoid sensory inputs that may worsen the pain. And, some sufferers will attempt to distract their attention from the area that hurts to another site by physical maneuvers.

The physical signs described here are categorized as relating to sympathetic discharge, positional relief, sensory avoidance, and pain distraction. For convenience, each of these categories is in table form on the following pages to readily assist healthcare providers.



Uncontrolled, severe pain can almost always be identified by objective physical signs that help practitioners differentiate between drug-seekers and relief-seekers, as well as to determine if opioid dose is adequate.

Signs of Sympathetic Discharge

Sympathetic, or adrenergic, discharge is caused by two concomitant mechanisms. Adrenergic receptors in the central nervous system are activated by uncontrolled pain, and these central receptors in turn activate the autonomic nervous system by sending electrical impulses downward into the periphery via the vagus nerve and the autonomic nerve network.⁷⁻⁹ The second mechanism is activation of the hypothalamic-pituitary-adrenal axis and the out-pouring of catecholamines (adrenaline, dopamine, and noradrenaline) and glucocorticoids (pregnenolone, cortisol) into the blood stream.⁵⁻⁷

Findings of excess sympathetic discharge can be detected in both acute and chronic uncontrolled pain. (*Tables 1 & 2.*) The author has frequently heard the comment that sympathetic discharge signs are only present with acute pain, but these signs occur with any uncontrolled pain. Signs of sympathetic discharge even can be detected in non-verbal or comatose patients, such as infants or bed-bound elderly. While not all of the sympathetic discharge signs are present in every patient, elevated pulse rate, hypertension, dilated pupils, vasoconstriction, and diaphoresis are almost always seen in patients whose pain has elevated above a critical threshold that is biologically specific to that person.

Sympathetic discharge signs can be quickly and easily assessed in clinical practice. Medical or nursing assistants, and even the patient, can take a blood pressure and pulse rate that can be verified by the practitioner. A simple stroking of hands or feet can detect vasoconstriction (cold to the touch), and a light touch of skin under the eyes is a good place to feel the moisture of excess sweating. Examining pupils will require that fluorescent lights are turned off – normal pupil diameter is approximately 3.0 mm to 5.0 mm.

The author recommends that patients with severe, chronic pain should have a target pulse rate less than 88 beats per minute and blood pressure below 130/90 mm Hg. (*Table 2.*)

TABLE 1	
Sympathetic Discharge Signs	
■	Tachycardia
■	High Blood Pressure
■	Dilated Pupils
■	Vasoconstriction (Cold Hands or Feet)
■	Diaphoresis
■	Hyperreflexia
■	Insomnia
■	Nausea
■	Diarrhea
■	Anorexia

Table 2		
Recommended Objective Measures to Help Determine Uncontrolled Pain & Opioid Overmedication		
UNCONTROLLED PAIN	GOOD PAIN CONTROL	EXCESS OPIOIDS
Pulse rate > 88 beats per minute	Pulse between 64 to 88 beats per minute	Pulse rate < 64 beats per minute
Blood pressure > 130/90 mm Hg	Blood pressure between 110/70 and 130/90 mm Hg	Blood pressure < 110/70 mm Hg
Pupil diameter > 5.0 mm	Pupil diameter between 3.0 and 5.0 mm	Pupil diameter < 3.0 mm
Cold hands or feet	Normal temperature	Very warm hands or feet

At-Home Blood & Pulse Monitoring

Chronic pain has a baseline or persistent component, as do breakthrough pain or pain flares. For this reason, patients should be taught to take their BP and pulse at home when breakthrough pain or flares occur. This can be done using modern BP/pulse monitoring devices that can be obtained inexpensively at most pharmacies or large retail outlets.

Patients should keep an ongoing record and bring this to their practitioner for review. This way, healthcare providers can determine if their medical regimen is effectively controlling pain when the patient is outside the clinical setting. Additionally, patients and their families need to know that severe, chronic pain raises blood pressure and/or pulse rate, and that these elevations may lead to cardiovascular complications such as coronary artery disease and cerebral vascular accidents (strokes).

Once patients and families observe that blood pressure and pulse rate go up with pain intensity, it is easy for the practitioner to instruct them that a rise in adrenaline and cortisol is occurring, and that these effects may produce elevated blood lipids and glucose that may hasten the development of arteriosclerosis and/or diabetes. Essentially, chronic pain of enough severity will cause sympathetic discharge and this physiologic phenomenon is a profound cardiovascular risk.¹⁰⁻¹³

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Signs of Positional Relief

Patients who “hurt” during certain movements or physical functions will naturally attempt to avoid the pain by finding a comfortable position. They may do this over a period of months to years and leave telltale physical signs that are easily observable, but might be overlooked if the practitioner is not alert to them. (**Table 3**.)

In its simplest form positional relief is present in the patient who walks with a limp, drags a foot, or walks off-balance. Other signs can be observed in the patient who leans in one direction to relieve back pain, or in the headache patient who frowns on one side. In these cases a permanent crease on one side of the back or forehead can be detected. If the patient seeks positional relief long enough, some muscle groups hypertrophy to compensate for the extra load while others may atrophy due to minimal use. Patients who walk abnormally to seek pain relief may have one shoe sole that wears down in one spot compared with the opposite shoe.

The basic physiologic problem with long-term attempts to use positional relief is that some body parts become asymmetrical. Rather than a balance of two equal sides, one side becomes overused with subsequent muscle hypertrophy and possibly degeneration of joints. For example, a patient with a painful right knee may typically over-weight and over-use the left hip and knee, which may lead to degenerative arthritis and pain in the left hip and knee that is secondary to the original pain.

The side of the body that was originally in pain – and thus favored and underused – will undergo muscle atrophy and possibly contractures. For example, a patient with a severe, painful neuropathy in one extremity may develop permanent atrophy and contractures to the point that the extremity is functionless. The atrophic side will often become cool to the touch as circula-

TABLE 3
Common Positional Relief Signs

- Walks imbalanced, wide gait, foot drag or limp (shoes don't wear evenly)
- Leans while sitting or standing
- Lies on floor
- Sits on edge of chair
- Looks straight ahead (won't turn head)
- One shoulder raised or lowered
- Forehead crease on one side
- Muscle hypertrophy or atrophy of back muscles
- Difference in temperature between sides

NOTE: *These are all signs of body asymmetry.*

Unless severe pain is controlled, physical signs of asymmetry in affected areas of the body will invariably emerge.

tion also apparently decreases in the area.

Fundamentally, the practitioner should look for physical, objective signs of asymmetry when evaluating a chronic pain patient. Unless severe pain is controlled, physical signs of asymmetry in affected areas of the body will invariably emerge over time.

Signs of Sensory Avoidance

Closely related to positional relief is sensory avoidance. The obvious example of sensory avoidance involves a painful area that gets even more painful with touch. Uncontrolled pain hyper-stimulates the autonomic nervous system, so practically any sensory input may cause additional pain. (*Table 4.*)

The classic case is the migraine patient who turns out the lights, lays alone in a room, and covers their head and eyes. This patient may hurt worse with any sensory input, including light, noise, smell, eating, or movement.

Some extremely painful conditions such as reflex sympathetic dystrophy (also called chronic regional pain syndrome), adhesive arachnoiditis, and diabetic peripheral neuropathy produce such pain that even light touch is unbearable (allodynia). In these cases, patients may not wear clothes or allow a sheet to cover themselves. They may not wear shoes or socks. Patients with neuropathies of the face, head, and neck may not brush their teeth, shave, or comb their hair. Any attempt by the examiner to touch the affected area will be met with immediate withdrawal of the body part and a sudden “no” response from the patient.

Patients with painful conditions of the upper torso, including fibromyalgia, abdominal adhesions, or cervical spine conditions may speak slowly, softly, and with hesitancy – for fear that a forceful voice and the effort of speaking might produce more pain. Often patients in severe pain will sit on the edge of their chair and stare straight ahead, because leaning back or turning their head is painful. Patients with spinal or abdominal diseases may breath so slow and shallow that their carbon dioxide (CO₂) levels increase.²

Signs of Pain Distraction

Patients in severe pain may not only attempt to avoid sensory input and find positional relief, they also may attempt maneuvers or techniques to distract their attention away from their pain. These can sometimes be physically observed by the practitioner. (*Table 5.*)

Grinding of the teeth can sometimes be detected by whittled-down teeth. Lip biting and fist clenching are common. Less commonly observed is overheating of a painful area with a hot water bottle or heating pad.

TABLE 4
Common Sensory Avoidance Signs

- Speaks slowly, softly, hesitantly
- Wears sunglasses / stays in dark
- Delays answering questions
- Wears hat (to shield scalp, hair)
- Walks slowly, deliberately and with wide gait, limp, or foot drag
- Stares or looks straight ahead
- Avoids noise
- Shallow breathing
- Doesn't eat or drink
- Wears loose or no clothes over painful areas
- Won't brush teeth, shave, or comb hair

TABLE 5
Common Pain Distraction Signs

- Grinds/grits teeth
- Clenches knuckles/toes
- Overheats skin (may show permanent burn marks)
- Hits head, fist, or foot against wall
- Cigarette burns or cuts
- Bites lips
- Gouges or squeezes skin

Sometimes permanently mottled skin or actual burns can be observed. Rarely, some patients become so tortured with pain that they will bang their head, fist, or foot against a wall, and the trauma of this activity may be evident. Cigarette burns or cuts may be intentionally self-inflicted.

Importance of Physical Signs in Guiding Opioid Dosing

In most medical practices today, in addition to legitimate pain-relief-seekers, who are the majority, there can be opioid-drug-seekers with less genuine intentions. During the initial evaluation of all new patients they should be physically examined for the objective, physical signs of legitimate pain that are described above.

If none are found, nonopioid treatments should be satisfactory for pain treatment. If a practitioner encounters a questionable patient, the patient's close family members can usually verify behavioral signs compatible with positional relief, sensory avoidance, or pain distraction attempts. Experienced drug-seekers may be able to fake certain signs of severe pain during an office visit, but would not consistently exhibit such behaviors with family members.

Patients who are receiving ongoing, outpatient opioid treatment will periodically require an adjustment in opioid dosage. Increases in dosages usually should be prescribed if the patient's complaints of uncontrolled pain are confirmed by evidence of excess sympathetic discharge such as tachycardia, hypertension, cold hands/feet, or dilated pupils.

For example, a patient who states his/her pain is an 8 out of 10, *and* demonstrates a pulse rate of 100 and pupil dilation greater than 5.0 mm, warrants a higher opioid dosage or an additional opioid. Conversely, if the same patient demonstrates a normal blood pressure, pulse rate, and pupil size, an adjustment in opioid dosage might be postponed for later evaluation. In this case, daily at-home tracking of pulse and blood pressure by the patient and an interview with the family could be in order.

Summary

The objective, physical signs of excess sympathetic discharge, sensory avoidance, positional relief, and pain distraction should be sought by physical examination in every pain patient. In this way, complaints of severe pain by a patient can be confirmed by objective physical signs. While it is imperative that patients (and possibly family members) should be interviewed as to their perception of pain's severity, pain that is above a critical threshold for each individual produces objective, physical signs that can be even more evident than the usual physical signs of such common disorders as diabetes and coronary artery disease.

A search for objective, physical signs of excess sympathetic discharge, sensory avoidance, positional relief, and pain distraction should be part of the physical examination of every pain patient.

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PAIN TREATMENT TOPICS

Published by...

Pain Treatment Topics
202 Shermer Road
Glenview, IL 60025
<http://Pain-Topics.org>

Supported by an unrestricted educational grant from Covidien/Mallinckrodt, St. Louis, MO, USA.

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Publication Date: June 2008