The meaning of pain expressions and pain communication

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Abstract (341 words)

Both patients and clinicians frequently report problems around communicating and assessing pain. Patients express dissatisfaction with their doctors and doctors often find exchanges with chronic pain patients difficult and frustrating. This chapter thus asks how we could improve pain communication and thereby enhance outcomes for chronic pain patients. We argue that improving matters will require a better appreciation of the complex meaning of pain terms and of the variability and flexibility in how individuals think about pain.

We start by examining the various accounts of the meaning of pain terms that have been suggested within philosophy and suggest that, while each of the accounts captures something important about our use of pain terms, none is completely satisfactory. We propose that pain terms should be viewed as communicating complex meanings, which may change across different communicative contexts, and this in turn suggests that we should view our ordinary thought about pain as similarly complex. We then sketch what a view taking seriously this variability in meaning and thought might look like, which we call the "polyeidic" view. According to this view individuals tacitly occupy divergent stances across a range of different dimensions of pain, with one agent, for instance, thinking of pain in a much more 'body-centric' kind of way, while another thinks of pain in a much more 'mind-centric' way. The polyeidic view attempts to expand the multidimensionality recognised in, e.g., biopsychosocial models in two directions: first, it holds that the standard triumvirate – dividing sensory/cognitive/affective factors – needs to be enriched in order to capture important distinctions *within* the social and psychological dimensions. Second, the polyeidic view attempts to explain (at least in part) *why* modulation of experience by these social and psychological factors is possible in the first place. It does so by arguing that because the folk concept of pain is complex,different weightings of the different parts of the concept can modulate pain experience in a variety of ways. Finally, we argue that adopting a polyeidic approach to the meaning of pain would have a range of measurable clinical outcomes.

Clinical Implications (101)

First, by making a subject's tacit beliefs about pain explicit it will be possible to create a more open, shared space for pain communication (particularly between clinicians and patients) and support a move away from purely quantitative measures of pain towards more discursive pain narratives. Secondly, the polyeidic view might provide a mechanism for predicting who will do well or badly from cognitive interventions for pain management, allowing more efficient use of healthcare resources. Finally, the polyeidic approach might also contribute to the creation of more nuanced cognitive interventions, by elucidating the pre-conscious beliefs that influence a subject's experience of pain.

Keywords
Polyeidic theory, chronic pain, communication of pain, meaning of pain terms.

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In her 1926 essay "On being ill" Virginia Woolf laments the poverty of our language for pain – "let a sufferer try to describe a pain in his head to a doctor and language at once runs dry," she notes.[1] Looking at studies of patient-doctor exchanges about pain, particularly those dealing with chronic pain, it seems that Woolf's worry is born out.[a] Both patients and clinicians frequently report problems around communicating and assessing pain, with patients expressing dissatisfaction with their doctors and doctors often finding exchanges with chronic pain patients difficult and frustrating.[2-5] Yet we know that positive patient-clinician interaction matters to both parties and that a patient's sense that they are being listened to can increase their overall sense of well-being , as well as promoting adherence to lifestyle changes and medical interventions that lead to reduced levels of experienced pain.[6-8] So, how could we go about improving pain communication, and thereby enhance quality of life, particularly for chronic pain patients?

This chapter explores that question by reflecting on what might be learned from philosophical accounts of the meaning of pain terms, seeing how these views impact on practical issues around pain communication and shed light on a newer model of how to think about pain communication (one that we hope might deliver concrete clinical improvements).

Joanna Bourke, in a 2014 New York Times article, describes being in hospital and telling a friend that her pain is "beyond words," only to be reminded by her friend that she has been talking about her suffering for the past hour.[9] Perhaps, her friend empathetically notes, the problem isn't that people can't speak about pain but rather that witnesses refuse to hear. We want to propose a mid-ground between Bourke's remark and her friend's perceptive response: the problem with pain communication and assessment, we suggest, is not that pain is entirely beyond words, nor is it that hearers simply refuse to listen. Rather it is that speakers and hearers need to be aligned in how they are thinking about the multiple different dimensions of pain in order to really hear what one another says.[b]

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[a] Scarry E. *The Body in Pain: the making and unmaking of the world.* [New York: Oxford University Press. 1985] provides perhaps the most well-known contemporary defence of the view that pain cannot be captured in language.

[b] A word of clarification on the discussion that follows: although we will often phrase things in terms of "the meaning of pain terms," what we are really interested in in this chapter is pain communication. For those familiar with philosophical distinctions, our interest is in pragmatic content (the complete, context-dependent message a speaker conveys by her utterance) rather than purely semantic content (the literal meaning of words and phrases). Thus, we don't intend to take a stand here on whether the distinctions we draw are ones that are ultimately best modelled as part of the semantics of pain expressions or are rather part of the pragmatics of pain communication. Although this is a crucial question, we don't have space to pursue it here, so simply set it to one side.

1 Philosophical accounts of the meaning of pain expressions

In most areas of discourse, it seems that for communication to take place a hearer must understand what a speaker means by her terms. For instance, if I say "I am going to the bank" intending to mean that I am going to the riverbank, but you take me to have said that I am going to a financial institution, it seems clear that communication has failed. Thus, in this section, we consider the question of what it would mean for two people to mean the same thing by their pain terms. Philosophers of language have suggested a number of different possible criteria for judging that two expressions have the same meaning and we survey three common proposals that may be made for pain terms: sameness of reference, sameness of associated descriptive or cognitive content (what philosophers often call "sense"), and sameness of affective or experiential effects (what philosophers sometimes call "expressivist" content).

1.1 Sameness of reference

Some terms in a language (those we might label "descriptive phrases") seem to serve to pick out objects via the properties those objects possess. So, for instance, a description like "the current president" picks out a person just in case they have the property of being the current president and the expression seems able to pick out different people at different times or places. (eg, selecting Barack Obama if uttered in America in 2015, or Olusegun Obasanjo if uttered in Nigeria in 2000) On the other hand, some expressions, like proper names or what philosophers call indexical or demonstrative expressions (terms like "I," "she" or "that girl"), seem (at least on some of their uses) to pick out things in the world independent of those objects' descriptive profiles. So, the name "Barack Obama" picks out a particular individual whether or not he is now, or indeed ever became, US President, and it hangs on to that individual regardless of any other changes in his properties (such as where he lives or who he works for, etc). John Stuart Mill (better known for his creation of the ethical theory "Utilitarianism") argued that the meaning of one of these latter types of expressions – what we will call a "referring term" – is exhausted by the object to which it attaches. Since, on the Millian view, there is supposed to be nothing more to the meaning of a referring term than the object to which it refers, two referring expressions which refer to the same object *must* have the same meaning.

So, one option for pain terms would be to claim that they are simple referential expressions – they label the pains to which they refer – and thus two pain terms mean the same just in case they both refer to one and the same pain.[c] A patient and a clinician could thus be assured at least the basic starting point of successful communication as long as the pain terms they use in their conversation do in fact coincide in reference, ie, so long as they both pick out the same pain object. However, this simple view faces objections from two different directions: first, it is unclear that pain expressions really can be treated as genuine referring terms, and second, the Millian view of proper names itself faces some serious challenges. In what follows, we consider only the first of these worries.[d]

Thinking about the nature of pain first, if we are to treat pain terms as referring expressions this imposes on us a view about what pains are – they must be things, capable of being referred to from both the first-person perspective and the third person perspective (ie, the patient must be able to refer to a discrete pain that she feels, while the clinician must be able to refer to one and the same pain, even though she does not feel it). This way of thinking about pains is certainly codified in many of the linguistic forms used to talk about pain; so, for instance, I might say that "I have a headache" or that "My backache is really bad today." These possessive forms of linguistic expression treat pains as objects (compare "I have a potato") – ordinary language does, it seems, treat headaches and backaches as things on a par with ordinary, physical objects, things which individuals stand in possession relations to.

However, despite its intuitive appeal, reflection shows that this simple referential view of pain also faces some potential problems. First, looking at the grammar of our language, it is unclear whether we should treat pain terms as count nouns (like "dog") or mass terms (like "water"), for both uses seem possible. A count noun is a term where we can give a numerical answer to the question "How many F's are there?" – so we can ask "How many dogs are there in the park?" but "How many waters are there in the glass?" seems ill-formed. For pain, then, we can speak of "A pain in the foot" or say, "I have one pain in my foot and another in my thigh," where "pain" clearly operates as a count noun. However, we also say things like "There is pain around here" or "I've been having pain all night" where "pain" seems to operate as a mass term.[10(p.12)] More problematic still, some expressions treat pain as a process rather than as an object. For instance,

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[c] Bourke, J. *The Story of Pain.* [Oxford: Oxford University Press. 2014] rejects this reifying model, where pain is conceptualised as an entity that can be referred to. Instead she argues for an adverbial approach where pain expressions qualify verbs; as she writes (2014: 7) "pain is not an intrinsic quality of raw sensation; it is a way of perceiving an experience". See also Tye M. Pain and the Adverbial theory. *American Philosophical Quarterly* 1984; 4: 319-327.

[d] For an overview of the problems with the Millian view per se, see the entry on "Names" in the Stanford Encyclopaedia of Philosophy (https://plato.stanford.edu/entries/names/).

instead of "I have a pain in my ankle," I could say "My ankle hurts" or "I have a sore ankle," yet these linguistic forms make "ankle" the thing being referred to, with "hurting" a process this object is undergoing, or soreness a property this object has. In English, speakers seem quite happy to switch between these two alternative modes of expression, even in the process of describing a single episode of pain.[10] While in some other languages it seems that process constructions are favoured over object uses.[11(chapter 6)] So, looking just to our language, it seems that there is evidence for different stances on the kind of referential expressions pain terms might be: count nouns, mass terms or labels for processes.

Second, even if we treat pain terms as referring to discrete objects, we still need to know what kind of objects those might be. Given the common assumption that to have a pain is to have a certain kind of sensation, we might intuitively think that a given utterance of a pain term refers to a particular episode of that sensation, however this then raises the question of how clinicians, when talking with patients in pain, manage to refer to sensations which the patient, but not they, are currently having. This raises the fundamental dichotomy of pain talk: the contrast between the private (an internal experiential state) and the public (third-person discussions of pain), and this contrast formed the basis of a prolonged attack on the referential view of pain terms from the philosopher Ludwig Wittgenstein. In his seminal book *Philosophical Investigations*, Wittgenstein sketched a number of arguments that purport to show that we cannot in fact treat pain terms as referring to internal, private sensations.[12]

For instance, Wittgenstein asks us to consider a man who keeps a diary in order to record his sensations. On day one the man has a sensation of pain which he decides to label "S," and he thus writes "S" down in his diary to record this occurrence. A few days later, the man has another sensation and he is now faced with the question of whether he should label this sensation "S" as well or introduce a new name "S*" for it. What the man needs to decide is whether his current sensation is the same as, or different from, the one that he experienced earlier, but Wittgenstein argues that there is simply no criterion by which the man can be said to be going right or wrong here. Imagine that the man decides the current sensation does feel the same as the last one and so he labels it "S" again. There is no possibility of overruling the man here, we must judge that he acts correctly. On the other hand, imagine that the man decides the sensation feels different from the previous one, and so he labels it "S*". Here again it seems we have no option but to accept what he does as correct – the subject is the sole arbiter of whether the two sensations feel the same to him. Yet this seems to entail that there is no genuine criterion of correctness available in this case – whatever the man decides to do is right. Compare this with the man who learns that the vehicle he is looking at is called "a bus." If he later sees a train and decides it is the same kind of thing as the vehicle he saw earlier and so calls it "a bus," we can judge that he has made a mistake. There is a public consensus as to what counts as going on correctly with a term like "bus" and this doesn't include applying it to trains. The subject is the only person who can decide how he should go on, but this means that there is simply no objective criterion of right or wrong when it comes to labelling internal experiential states. Yet in the absence of such a criterion Wittgenstein suggests that the whole practice of naming breaks down. Naming, he suggests, depends on a shared practice, where it is possible to criticise someone for getting the practice right or wrong, and if this is absent then the very act of naming itself is meaningless. As he writes:[12(92e, 257)]

> When one says "He gave a name to his sensation" one forgets that a great deal of stage setting in the language is presupposed if the mere act of naming is to make sense. And when we speak of someone's having given a name to pain, what is presupposed is the existence of the grammar of the word "pain"; it shows the post where the new word is stationed.

According to Wittgenstein, if pain terms named private sensations they would constitute what he calls a "Private Language" – a language made up of words where only the speaker has access to what those words mean – but, he argues, such a language is not in fact possible.[e]

If we accept Wittgenstein's worries, one option would be to preserve the simple referential view of pain terms but argue that they refer not to some hidden mental state but to something more observable, such as public pain behaviour. This would be to adopt a "behaviourist" model for the meaning of pain terms, whereby saying that someone is in pain means simply that there has been a certain kind of environmental stimuli (eg, an event causing tissue damage) and that the subject is now displaying certain kinds of behaviour (eg, they rub the affected limb, say that they are in pain, etc). The behaviourist picture does seem to capture something intuitively correct about the meaning of pain and pain terms, for ordinary folk do often take appropriate pain behaviour as criterial in attributing pain to someone else (for instance, expressing preference for nonverbal behaviour over verbal behaviour when judging/interpreting the

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[e] Echoes of Wittgenstein's worry can also be found in Elaine Scarry's rejection of the referential model for pain terms. As she writes in *The Body in Pain: the making and unmaking of the world* [New York: Oxford University Press. 1985, p.162]: "[P]ain is not 'of' or 'for' anything – it is itself alone. This objectless-ness, the complete absence of referential content, almost prevents it from being rendered in the language."

credibility of pain displays.[13] Furthermore, as some authors have recently noted, a public or social aspect to pain (recognition of which lies behind a move towards this kind of behaviourist model) may indeed be fundamental to pain.[14] [15] However, although such an approach would avoid Wittgenstein's worries about privacy (and indeed some people have read Wittgenstein as favouring a behaviourist model, although he himself seems clearly to reject such an attribution), still the behaviourist model seems far from satisfactory. For a start, we are willing to allow that someone can be in pain without displaying the appropriate kinds of behaviour; for instance, someone may be stoically not crying out, etc, or they could be paralysed in such a way that displaying pain behaviour is not possible for them. Yet (as the Note accompanying the IASP definition of pain makes clear) the lack of pain behaviour in these cases doesn't force us to conclude that the subjects are not experiencing pain. On the other hand, we also allow that someone can engage in appropriate pain behaviour without actually being in pain: a footballer might roll around on the ground in apparent agony simply in order to get his opponent booked. So, while appropriate behaviour is a good guide for attributions of pain, it seems wrong to think that the meaning of pain expressions can be given simply by reference to this behaviour.[f]

As noted above, there seem to be two common elements to paradigm cases of pain: pain sensations and bodily damage. Thus, a final candidate for the referential objects of pain expressions might be bodily injuries themselves. Pain is most commonly experienced in the context of an injury, or potential injury, to the body making tissue damage or nociception the most intuitive "ground truth" in terms of making an attribution about pain.[g] However the problem with treating injury as the referential object of pain expressions is what Melzack and Wall termed the "variable link" between pain and injury.[16] In cases such as episodic analgesia or congenital insensitivity to pain, severe injury can occur without any pain. Conversely, phantom limb pain occurs without injury to the site at which the pain is experienced. Furthermore, many chronic pain disorders occur without any apparent injury or clear pathology. While we cannot, in these

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[f] Perhaps a better option then would be to reject the view of sensation states upon which Wittgenstein's objections are premised, whereby they are essentially private, hidden states (ie, that they are what philosophers would term "Cartesian mental states," from Descartes theory of mind). We won't explore this option in what follows, but note that this may be the kind of move Wittgenstein himself favoured.

[g] As the IASP definition of pain notes (https://www.iasp-pain.org/Education/Content.aspx?ItemNumber=1698#Pain), pain is commonly thought of as an experience "associated with actual or potential tissue damage, or described in terms of such damage". Though, as Aydede M. Defending the IASP definition of pain [*The Monist.* 2017; 4: 439–464] points out, this latter point is probably better phrased as being *describable* in terms of such damage, rather than requiring actual description in these terms.

cases, rule out the possibility that peripheral pathology exists undetected, such cases demonstrate the difficulty of using injury as the referential object for reported pain.[h]

To summarise, the referential model of pain terms does indeed seem to capture an intuitive truth about our use of pain expressions: pain terms are often used in a paradigm referential manner and subjects do seem naturally to conceptualise pain in this referential way. However, evidence from natural language also supports treating pain terms in a variety of different referential ways (as count nouns, as mass terms, and as process expressions) and as having a variety of different potential referents (pain sensations, pain behaviour, and bodily injury). It seems that we might expect a truly satisfactory account of pain terms to capture this potential variety of meaning.

1.2 Sameness of sense

Whereas Mill thought that the meaning of a name was wholly given by the object to which it referred, Gottlob Frege, the 19th century philosopher and logician, held that the meaning of a name is given (at least in part) by its descriptive content. So, for instance, take the names "Cary Grant" and "Archie Leach": although these two names coincide in reference (they pick out one and the same man), they seem to differ in meaning as they pick out that person in different ways or via different properties. (eg, "Cary Grant" picks out a famous film-star, but "Archie Leach" picks out someone non-famous, perhaps thought of simply as the brother of John Leach) Frege's insight was to realise that someone who believed that "Cary Grant was a famous film star" might perfectly rationally not believe that "Archie Leach was a famous film star" (Frege's example concerned Hesperus and Phosphorous), yet this seems to show that there must be more to the names' meaning than just the objects to which they refer, since if reference was all there was to the names, it would be hard to see how someone could understand both names and yet fail to realise that they refer to one and the same object. Names, then, Frege suggested come with or abbreviate some kind of descriptive content. Frege labelled this the name's "sense." On this model, what is required for sameness of meaning is sameness of sense: it is not (or at least, not just) that two token terms must pick out the very same thing in the world, the way that they pick out that thing must match. With regard to pain terms, this would mean that two people must be thinking of a

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[h] Furthermore, recent work shows that, in certain kinds of hypothetical scenarios, people are willing to use pain terms to describe a target individual even when it is stipulated that the target has not undergone any relevant injury; see Borg E., Harrison R., Stazicker J, Salomons T. Is the folk concept of pain polyeidic? *Mind and Language*. 2019. Online first: https://doi.org/10.1111/mila.12227.

state in the same way – under the same description – in order for them to converse successfully about pain.

This view apparently commits us to the idea that there is a unique quality which all pains have in common and which we can use to describe them (so that pains have a unique *painful* way of feeling). While intuitively this claim seems extremely plausible, we should note that it, too, is not without problems. First, one could query whether there really is an underlying phenomenological identity between, say, a stabbing pain in the stomach and a dull ache in the head. (this recognition – of the vast range of sensations we are willing to class as pains – is sometimes known as the *heterogeneity problem*)[i] Although it is undeniable that we do classify quite distinct experiences under the shared label "pain," one might wonder whether this is due to all the experiences having a common, shared phenomenology, instead of some other (potentially higher-level) form of commonality. More problematic, however, is the worry that positing a unique phenomenal quality shared by all and only pains seems to lead to something of an explanatory cul-de-sac, for there is little more which could be said to explain or make clear this special experiential sense. This is exemplified by the use of the term "algosity" by Field to label pain's characteristic phenomenology.[17] Despite the clear benefits of identifying the experiential source of our judgements about what is and isn't painful, the term never went into wide use. The most likely explanation for this lack of traction is that the term didn't describe what the characteristic quality "was," only what it "was not": essentially algosity was defined as the negative sensory and affective quality that separates pain from other sensory experiences that are experienced as unpleasant (eg, itch and dysthesia). The term essentially functioned as a conceptual placeholder for Fields' argument that sensory and affective qualities of pain are inseparable and that there is an affective quality inherent in the (so-called) "sensory-discriminative" dimension of pain that is, in fact, pain's defining feature. This pedagogical utility, however, did not translate into scientific or clinical utility, as it did not provide any guideline for identifying or isolating this phenomenological quality in a way that would allow us to compare or contrast the algosity present in, for example, two different pain experiences. We are thus left with the view that two token pain terms mean the same because they both express

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[i] As Clark (p.184) puts it: "what is the sensory resemblance between the intense freezing pain of an almost frozen foot and the diffuse hot pain of a sunburned back?". Clark, A. Painfulness is not a quale. In Aydede M, (ed.). *Pain: New Essays on Its Nature and the Methodology of Its Study*. Cambridge, MA: MIT Press; 2005. pp. 177-198.

the same ineffable sense, and we might feel that this hasn't taken us very far down the road of explaining the meaning of pain terms. Again, then, although the view that, for pain terms, sameness of meaning means sameness of sense captures something intuitively compelling about our use of pain terms, it is unclear that this can give us the full or complete story.

1.3 Expressivist model

Finally, perhaps the notion of sameness of meaning is special for pain terms because they perform a special role in our language, neither referring to objects nor describing them, but expressing our response to a sensation. In this way, saying "It hurts" or "I'm in pain" would be more like a cry or a groan, or saying "ow!" In this way two speakers might mean the same by their pain terms if they both expressed the same kind of basic affective response to a stimulus. This sort of expressivist view was canvassed (though rejected) by Wittgenstein: [12(§244)]

> [H]ow does a human being learn the meaning of the names of sensations? Here is one possibility: words are connected with the primitive, the natural, expressions of the sensation and used in their place. A child has hurt himself and he cries; and then adults talk to him and teach him exclamations and, later, sentences. They teach the child new pain-behaviour.

However, this expressivist view seems problematic for a number of reasons. First, saying "I am in pain" is an articulate use of language, the expressions making up the utterance belong to the general domain of English and can be combined with other words of English to make different, meaningful grammatical structures. For instance, "I am in pain" can be a premise in a valid logical inference (which requires it to express a truth-evaluable claim), but exclamations of pain cannot be used in this way (compare "I am in pain therefore someone is in pain" with "Ow! Therefore someone is in pain"). Furthermore, saying "I'm in pain," or using richer language to describe one's experiential states (saying "This is a searing pain" or "There is a persistent ache at this point in my lower back") is a voluntary linguistic action (a speech act), unlike more primitive interjections. Finally, the model of pain terms as simple expressions of an affective response also seems to fit badly with Melzack's recognition that more intense pains are described with more words – clearly to make sense of this phenomena it seems that the words must be contributing semantic content (or meaning) to the utterances in which they occur.[18(p.201)]

As noted above then, it seems that each of these philosophical ideas captures something correct about how we use pain terms. Perhaps unsurprisingly, each account gains its credibility from answering to some intuitively correct dimension of our use of pain expressions. Thus, an account of pain communication which ignores any of these accounts does so at the risk of missing some genuine feature of our use of pain terms. It follows, though, that treating any one of them as giving us the complete, privileged account of the meaning of pain terms will also lead to serious problems. Treating all pain terms as simple referring expressions, which pick out discrete, countable objects, means ignoring the very many uses of pain terms which don't fit this model (eg, where pain terms refer to mass qualities, or to processes). Treating all pain terms as having their meaning given by some ineffable private sensation requires us ignoring the social dimension of pain and leads to an explanatory dead-end. Treating pain terms as akin to grunts or cries requires ignoring the genuine semantic contribution that can be made by pain terms. What we want to suggest, then, is that to improve matters here we should adopt a model which permits all the kinds of variability in meaning sketched above, recognising that each of the proposals answer to just one element amongst a multitude of important dimensions people recognise in their thought and talk about pain. What we need is a model of meaning for pain terms and pain communication which is capable of recognising that pain talk is multidimensional and that what matters for successful communication is recognising which of the many dimensions of pain are to the fore (and in what way or to what degree). In the next section, we want to provide an initial sketch of what one such a model might look like, before turning in §§3-4 to explore some of the potential clinical advantages of adopting this kind of approach.

2 The polyeidic approach to pain communication

Part of the problem with the philosophical views canvassed above, we claim, is that they assume too one-dimensional a view of pain communication, seeing speakers as *either* referring to a hidden internal state *or* referring to some process bodily parts can undergo *or* as describing a unique phenomenal character *or* doing something akin to grunting and crying, etc. We would like to suggest that a better model would be one that allows that people allude to different dimensions of pain in their communicative acts and that communication goes better when both parties recognise the dimensions in play and agree on their relative importance. Thus, we want to explore what we term a "polyeidic" (or "many-ideas") view.

The polyeidic account draws inspiration from three places: first, some work in philosophy which recognises a degree of complexity to bodily sensations in general; second, the common recognition in psychology that pain is a multidimensional phenomenon; third, the recognition that pain terms are scalar (that is to say, pain terms allow us to rank pains with respect to one another; for instance, we can say "My black eye is more painful than my broken nose," or "This hurts more than that"). Taking these points in order: some philosophers have recognised that sensations in general may have different dimensions or aspects. Thus, it seems that a token experience of a sensation has a sensory or experiential component (how it feels), and an affective or emotional component (how that phenomenological component is perceived by the subject), it may have a motivational force and it will have a duration and cause, and be influenced by context and by individual beliefs or background, etc. So, for instance, Brogaard holds that "bodily sensations are partial descriptions of emotions and tactile experiences or other events of the body";[19(p.1)] see also Merlau-Ponty's 1958 criticism, of the idea that experience or bodily sensation could be treated as simple, instead of shot-through with meaning.[20][j] On this kind of view, then, pain, as an archetypal sensation, should also be expected to have some kind of internal complexity. Furthermore, within psychology, the specific idea that pain is a multidimensional phenomenon, involving sensory and emotional experience, modulated by psychological, social and contextual factors, is well-rehearsed (eg, Melzack and Casey).[21] Thus, some authors explicitly recommend a "biopsychosocial model of pain," where the biological underpinnings of pain are recognised as just one determinate of a subject's pain experience, with biological factors modulating, and in turn being modulated by, an individual's psychological make-up and social context.[5] The polyeidic view attempts to expand the multidimensionality recognised in the biopsychosocial model in two directions: first, it holds that the standard triumvirate – dividing sensory/cognitive/affective factors – is insufficiently nuanced. For, as we suggest below, there are important distinctions to be drawn *within* the social and psychological dimensions. Second, the polyeidic view attempts to explain (at least in part) *why* modulation of experience by these social and psychological factors is possible in the first place, by pointing to the nature of the folk concept of pain as inherently complex (ie, as containing parts which can be operated on). The possibility of

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[j] We don't want to commit here to a view about whether experiential and affective elements can in fact be held apart or must comprise a single dimension.

modulation emerges, the polyeidic view claims, *because* the ordinary, folk concept of pain is itself multifaceted.

To begin to see how this might be possible, the polyeidic view turns to the third point above – the recognition that pain terms are scalar in nature. Recently in philosophy of language and linguistics there has been a great deal of work on scalar terms in general and it has become apparent that scalar terms come in different varieties: some (such as "rich") rank objects on just a single scale, while others (such as "intelligent," "healthy," or "red") are capable of ranking objects across a range of different dimensions. So, for instance, it is possible for one object to be "bluer" than another if it is closer to a paradigm blue, or if it has a greater colour intensity, or if more of its surface is coloured blue; or again, if we rank one food item as "more healthy" than another, it makes sense to ask "healthy in what respect?" as there are different ways in which something can be healthy or non-healthy.[22-24] In a similar fashion, then, the polyeidic view suggests that pain terms incorporate a range of different dimensions along which pain can be ranked. The polyeidic view thus claims that:

(a) the concept of pain is a concept that amalgamates a number of distinct dimensions

(b) these ideas or dimensions can conflict with one another[k]

(c) people hold latent positions on these rankings

(d) rankings are subject to predictable contextual influence

(e) positions on these dimensions have direct behavioural effects.

The polyeidic view takes seriously Melzack and Torgerson's insight that "The word 'pain'. . . refers not to a specific sensation which can vary only in intensity, but to an endless variety of qualities that are categorized under a single linguistic label."[25(p.50)]

Adopting a polyeidic model for the concept of pain makes it clear that there are two pressing questions that we need to settle if we are to clarify how we think and talk about pain:[l]

1. what exactly are the dimensions of pain?

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[k] So, for instance, the idea that pain is, on the one hand, a mental state, but also, on the other, a state which has a (non-brain) bodily location when instantiated, seems to involve a prima facie conflict; see Borg E., Harrison R., Stazicker J, Salomons T. Is the folk concept of pain polyeidic? [*Mind and Language*. 2019. Online first: https://doi.org/10.1111/mila.12227. 2019] §4, for further discussion of this idea.

[l] We might perhaps hope that answering questions (1) and (2) could help to provide an account of pain with a rather greater degree of normative force than that currently deployed in nursing, according to McCaffery and Beebe 1989: 7, whereby "Pain is whatever the experiencing person says it is, existing whenever the experiencing person says it does." McCaffery M, Beebe A. *Pain: clinical manual for nursing practice*. St. Louis Missouri: C.V. Mosby Company. 1989.

2. how should we model these dimensions?

Providing an adequate answer to either of these questions unfortunately goes far beyond the scope of the current chapter, but we would like to provide an initial sketch of some possible answers here.

2.1 The dimensions of pain

On the first question: there has been a relatively significant amount of work in both philosophy and psychology that directly or indirectly addresses the question of the dimensions of pain. For instance, a seminal work like the McGill Pain Questionnaire recognises a number of distinct sensory dimensions of pain, including descriptors like *burning*, *throbbing* and *stabbing* as ways of classifying different pains, while the IASP *Classification of Chronic Pain* 1986/1994 offers an extremely detailed taxonomy of chronic pain conditions, each with its own set of classifying features.[m] Furthermore, it is possible to see different philosophical theories of pain as focusing on different dimensions of a more generalised notion of pain. So, for instance, the imperative account of pain (see, eg, Klein 2015) stresses the motivational aspect of pains (and thus is well-suited to classic acute pain, such as that arising from broken bones, burns, etc, but sits less comfortably with chronic pains and atypical cases like pain asymbolia),[26] while an evaluative approach, such as that proposed by Bain stresses the affective aspects of pain – the characteristic unpleasantness of pains – and thus offers a good explanation of their motivational force and their characteristic phenomenological profile, but has less to say about the bodily dimension of pains and their locative properties.[27] [28] What we suggest is that further work enumerating exactly what the dimensions of pain are and the extent to which any of the associated aspects are necessary or sufficient for pain will be useful (as this will help informed decision making in currently controversial cases, such as the debate over whether social pain is really a form of pain at all, or something more like distress). So, a truly adequate account of pain might need to distinguish some or all the following dimensions as relevant to our thinking about pain:

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[m] See also the 3-way definition of pain in Sternbach R. *Pain: a psychophysiological analysis.* [New York: Academic Press. 1968], the account of pain as "sensation plus affect," in Szasz T. *Pain and Pleasure: a study of bodily feelings* [New York: Basic Books. 1975], and Leder's account of what he calls "the experiential paradoxes of pain", Leder D. The experiential paradoxes of pain. [*Journal of Medicine and Philosophy.* 2016; 41: 444-60.]

- mental/bodily dimension: accommodating the fact that folk often think of pains as paradigm mental, experiential states yet also as worldly states located in non-brain-based body parts.
- public/private dimension: accommodating the fact that folk often do think of pains as essentially private and yet they also often think of pain as the most publicly accessible of mental states (connecting to Wittgenstein's claim in the *Philosophical Investigations* that, in the right circumstances, there is just no room for doubting whether another is in pain when they seem to be in pain), with pain potentially having an ineliminable social aspect.[14 15]
- conscious/unconscious dimension: accommodating the fact that folk often think of pain as necessarily felt (initially rejecting the idea that someone could have a pain they are unaware of), yet, on prompting, will also usually allow the possibility of pain a person is not aware of (eg, allowing that a subject might have a pain they are momentarily unaware of when distracted, or that a person might be woken up by a pain, which seems to show folk allow that pains can exist before a person is aware of them).[n]
- aversive/non-aversive dimension: accommodating the fact that folk typically think of pains as unpleasant and thus aversive yet will also allow the possibility that pains are not always aversive (as in the case of eating spicy food or other forms of masochism).
- purposeful/non-purposeful dimension: recognising that folk think of pains as typically useful (ie, as designed in order to indicate bodily damage) but also as potentially useless (eg, in chronic pain conditions).
- motivational/non-motivational: accommodating the idea that pains are held to be motivational (they impel us to action to protect, favour or treat the injured part of the body)[26], yet folk allow that pain can sometimes fail to be motivational (eg, when considering the case of pain asymbolia).
- various sensory or affective dimensions (including the degree of intensity, duration, etc): recognising that pains can have different more fine-grained phenomenal properties which allow them to be ranked against one another along these dimensions (eg, the characteristics used in the McGill Pain Questionnaire).

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[n] The much-debated issue of "fish pain" is relevant here, as a cornerstone of the argument that fish don't feel pain is that they lack the requisite neural machinery necessary for consciousness and therefore can't feel pain. An acceptance of this argument by folk would seem to suggest that they hold that consciousness is necessary for pain.

Once we recognise the rich complexity inherent to thinking about pain, the possibility opens up that at least some of the problems of poor pain communication have their roots in a failure to properly appreciate differences between individuals concerning how they stand on these multiple dimensions of pain. In the final two sections of this paper we thus consider the potential clinical implications of adopting a polyeidic view of thought and talk about pain.

3 Assessing pain

The subjectivity of pain and the difficulties involved in effectively communicating pain poses an ongoing problem for clinicians who want to correctly diagnose and effectively treat their patients' pain. Developing a reliable and clinically useful method of measuring and communicating pain has been a major goal for pain researchers, and has led to the creation of a family of pain rating scales.[29]

The simplest of these scales are single-dimensional, and employ either ordinal, interval, or ratio scales that are intended to measure the *intensity* of a patient's pain. For example, the Verbal Rating Scale used by the University Hospital of Wales NHS Trust "is a four- point scale of no pain=0, mild=1, moderate=2 or severe=3."[o] Verbal Rating Scales are ordinal scales; there may be differences in magnitude between the intervals 0 and 1, and 1 and 2, etc., which are not captured by rating pains on the scale.[30 31]

Numeric rating scales anchor the endpoints of a numerical scale with "no pain" and "worst pain imaginable," and ask patients to rate their pain with a number from 0 to 10. Such scales might appear to be interval scales, which could represent something the ordinal verbal rating scale cannot, namely that equal differences between points on the scale represent equal differences in intensity of pain. For example, if numerical pain rating scales are genuine interval scales, the difference between "no pain" (a rating of 0 on the scale) and a rating of 1 should be the same as the difference between "worst pain imaginable" (a rating of 10 on the scale) and a rating of 9. But it is implausible that patients interpret numerical rating scales as involving equal distances between points, or even that in ideal conditions experimenters could establish such equal intervals between degrees of pain. Without such equal intervals, numerical rating scales should be treated simply as ordinal scales with more values than standard verbal rating scales.

Visual analogue scales employ either a vertical or horizontal line, typically 10cm long, anchored at either end with descriptions like those used on the numerical pain scales: "no pain" and "worst pain imaginable." [p] [29(p. S240)] Patients rate their pain by

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[o] http://www.paincommunitycentre.org/article/pain-assessment-tools

[p] Kenny DT, Trevorrow T, Heard R, Faunce G. Communicating pain: Do people share an understanding of the meaning of pain descriptors? [Australian Psychologist. 2006 Nov 1;41(3):213-8] found that the pain descriptor that participants rated the highest was "unimaginable", which problematizes the use of "worst pain imaginable" as the anchor for the upper end of pain scales, and raises the possibility that pain is a dimension (like height or cost) that does not have an upper bound.

marking a point along the scale line, which clinicians can then measure with a ruler to determine the patient's pain rating from 0-100. Katz and Melzack claim that visual analogue scales are superior to both verbal analogue scales and numerical scales.[32(p.5)] They write:

> A major advantage of the visual analogue scale is its ratio scale properties. In contrast to many other pain measurement tools, equality of ratios is implied, making it appropriate to speak meaningfully about percentage differences between VAS [visual analogue scale] measurements obtained at multiple points in time or from independent samples of subjects.

A ratio scale requires, in addition to equality of intervals, an equality of ratios. That is, if a patient rates a migraine at 8cm on the scale, then a broken rib that was rated at 4cm would be *50%* as painful. It is this property that Katz and Melzack give as an advantage over the verbal analogue and numerical rating scales of pain, and they cite the study conducted in Price et al. in support of treating visual analogue scales for rating pain as ratio scales.[33] Price et al. found that when patients were asked to indicate ratios of the intensity of pain sensations generated by heat pulses applied to the skin by a contact thermode, their responses indicated they were using the visual analogue scale as a ratio scale. For example, they consistently were able to identify a heat stimulus as producing pain that was twice as intense as a lower level stimulus. But even if participants are able to consistently assess pain ratios, there is still the question of how they are understanding the meaning of the pain that they are measuring. For example, Williams et al. document both inter- and intrapersonal variation in participants' understanding of what the meaning of the upper endpoint of the visual analogue scale means:[34(p.461)]

> One subject gave each of the following three descriptions [of the upper endpoint of the visual analog scale] at different points in the interview: 'the worst pain I have yet experienced'; 'the most severe pain I can imagine'; 'the worst pain you yourself have experienced…probably the worst you could experience'.

The meaning assigned to the upper endpoint of the scale will affect the meaning of ratios of that upper value: 50% of "the worst pain I have yet experienced" is a very different value than 50% of "the most severe pain I can imagine", or "the worst pain you could experience".

3.1 A multi-dimensional pain rating scale

One objection to the use of single-dimensional pain scales is that different types of pain may be *incommensurable*. The blinding, incapacitating experience of a migraine is very different than the mostly aching, but occasionally piercing pain of a broken rib, and "the pain of a toothache is obviously different from that of a pin-prick."[18(p.278)] [32] It therefore may not make sense to ask patients to rate the pain from migraines and broken ribs on the same scale.[q] Chronic pain also poses problems for comparing different types of pain on the same measurement scale, as Ballantyne and Sullivan observe: "When pain is chronic, its intensity isn't a simple measure of something that can be easily fixed".[35(p.2099)] Indeed, although the overwhelming emphasis in the field is on quantitative assessment methods, in light of chronic pain the limitations of these approaches are clear. For although such measures are essential to understanding or targeting mechanisms or benchmarking pain management, they are not designed to describe personal experiences of pain, or essential personal attributes of pain, such as the burden or meaning of pain. Consequently, patients with chronic pain often do not feel understood by their health care providers.[36]

The McGill Pain Questionnaire (MPQ) improves on single-dimension scales as it was designed to measure the variety of different dimensions of pain experienced by patients. The developers of the MPQ endorse a multi-dimensional conception of the meaning of "pain." As noted above, Melzack and Torgenson hold that:[25(p.50)]

> The word 'pain'...refers not to a specific sensation which can vary only in intensity, but to an endless variety of qualities that are categorized under a single linguistic label.

The MPQ was generated by asking participants to evaluate 102 pain-related words and group together those that were qualitatively similar, yielding 20 categories, which are in turn organized into three classes: *sensory*, *affective*, and *evaluative* expressions. Participants were then asked to rate the words in each category in terms of "how much pain each word represents."[25(p.52)] There was agreement among different groups of participants regarding the relative intensity conveyed by certain pain- associated words. For example, "crushing" was consistently rated as representing more pain than "pinching," and "pounding" was consistently rated as representing more pain than "flickering." On the assumption that intensity is a dimension along which the sensory, affective, and evaluative dimensions of pains can be assessed, the MPQ allows for four dimensions within which pains can be rated.

There is no principled reason for not expanding the dimensions of pain measurement permitted by the MPQ to include additional factors discussed above (perhaps expanding assessment from quantitative measures to more qualitative pain narratives).[37] [38] For example, while the MPQ tracks qualitative aspects of pain and

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[q] Price et al. [33], however, had no problem asking patients to compare the intensity of the pain generated by a contact thermode with the intensity of chronic back pain.

arranges them in terms of intensity, two pain sufferers or those treating pain may differ in terms of whether they classify pain as mental or as bodily, or in terms of some continuum between the two. They might also differ in the extent to which they think their sensations are meaningful signs of something wrong with the body (ie, believing that pain always constitutes a warning about bodily damage) or the extent to which they view their pain as motivational. These kinds of differences might affect what kinds of treatments a patient or clinician might think is appropriate for alleviating pain.

4 Clinical implications of the polyeidic view

Among the assumptions of the polyeidic view are that individuals hold latent positions on these hypothesized dimensions and that these positions have direct effects on their pain-related behaviours, including their communication about pain. Nowhere are these modulatory effects more relevant than when an individual seeks medical care for their pain. In what follows, we will briefly discuss some ways that a polyeidic perspective, and measurement of polyeidic dimensions might be clinically relevant.

Chronic pain patients are intense users of medical services. Communications between patients and their medical team (particularly at the primary care level) are critical for access to specialty care, adequate therapeutic interventions (pharmacological and non-pharmacological), compensation claims, and social support. In the absence of patient-specific information, physicians rely on schemas to make decisions, which leads to less effective treatment, particularly for women and visible minorities.[39] It is clear that effective communication is critical to appropriate care, but unfortunately, these interactions are frequently frustrating for patient and medical staff alike.[1-4] Many clinicians find it hard to accept pain without evidence of pathology and many patients feel stigmatised by clinicians who dismiss their reports or narratives of pain.[40] This situation can endure when clinicians apply current mechanism-based paradigms to pain reports/narratives that cannot be sufficiently explained.[41]

One source of poor clinical communication is basic differences between patients and clinicians in beliefs about pain, which have the potential to change behaviours and to lead to fundamental differences in how a patient's symptoms (and their behavioural responses to those symptoms) might be viewed. To illustrate how such differences might affect a clinical interaction, we present hypothetical differences along three of the putative dimensions suggested above:

Mental/bodily dimension: a physician has been trained to view pain as a symptom that will direct clinical investigation to some peripheral pathology which, once found and resolved, should result in the eradication of the pain. When testing indicates there is no evidence for peripheral pathology of imminent concern, the physician adopts a sceptical indifference. He tells the patient that the pain is "all in your head," with the implication that the patient need not worry about it. This advice makes no sense to the patient, whose concerns are triggered by the pain and anguish they feel, regardless of whether tissue damage is apparent.

Public/private dimension: A patient's wound is being examined by a nurse practitioner. She asks how it has been healing, to which he responds "fine, no problems." The nurse practitioner, believing that the patient would communicate a problem if there were one, sends him home without any further treatment. Afterwards the patient's wife asks why he didn't mention the nearly constant pain he has been experiencing at the wound site. He responds that "nobody wants to sit and listen to my bellyaching; besides, she's not going to understand."

Purposeful/non-purposeful dimension: A doctor prescribes a medication known to be effective for alleviating the chronic pain symptoms a patient has been experiencing. When the patient returns a month later, she asks how the medication worked. He tells her that he tried it once and it worked, but that he never took it after that. She asks why, he replies "I didn't want to mask the pain with drugs."

In each of these hypothetical examples, the clinical encounter has been ineffective based simply on differences in pain related beliefs that neither party may even be aware they hold. In the first, the physician has a far more body-centric view of pain than the patient. His concern about the pain is a function of its connection to injury, while hers is related to the feeling of suffering. In the second case, the patient views pain as something that one should keep to themselves and is sceptical that such a private experience even can be communicated, while the nurse practitioner not only presumes that pain can be effectively communicated, but that anyone who is able to do so, will do so. In the third case, the patient views pain as purposeful: It is trying to tell him something important and if he "masks" the pain with drugs, that message might not be delivered and he might suffer further damage as a result, a position at odds with the doctor's belief that the pain is non-purposeful, and not conveying any message that justifies continued suffering. In each of these cases, it is likely that clinician and patient leave the clinical encounter, not quite understanding why it was unsuccessful, perhaps thinking the other party irrational or lacking in empathy. In fact, these behaviours are rational if viewed as reflections of these individuals' latent beliefs about the essential nature of pain. Were a measure available that could outline these beliefs, the outcomes of these encounters would be less mysterious, and the parties would have the opportunity to reflect on their own beliefs and whether the resulting behaviours are adaptive or not.

An intriguing possibility that arises is that beliefs that lead to ineffective communications and/or maladaptive behaviours could be targeted for intervention. In fact, changing a patient's emotions and behaviours by altering maladaptive beliefs is the goal of cognitive behavioural therapy (CBT) and other cognitive therapies which have been demonstrated to be effective for pain.[42-44] Within the CBT framework, it is not necessary that the beliefs be accessible to the holder. A key principle is that there are reflexive or automatic patterns of thought that influence how pain makes us act and feel. For example, an individual might become anxiety ridden about a minor pain in their ankle. Within a cognitive behavioural conceptualisation, this response might be mediated by automatic thoughts that the therapist must teach the patient to become aware of (for example, in this instance, the individual might feel that pain is always a sign of serious damage and, as such, will likely render them unable to maintain their beloved jogging schedule). Because these automatic thoughts are reflexive or pre-conscious, they remain largely opaque and difficult to recognize for patient and therapist alike. The polyeidic approach outlines a novel and clinically tractable new framework for elucidating these pre-conscious beliefs, first by defining measurable dimensions along which these beliefs might differ between individuals, and second by widening the scope of beliefs to include beliefs about pain's essential nature.

The fact that these beliefs might be reflexive and not readily accessible to the patient suggests some guidelines for what a measure of these latent dimensions might look like. Given that these beliefs might reflect latent positions along dimensions that both patient and clinician might not have consciously considered, it should not be presumed that a patient's superficial agreement with statements made by the physician (such as those that might be outlined in an "our approach" style mission statement) necessarily suggest agreement. Nor should it be presumed that such statements necessarily reflect the clinician's latent position in a way that is determinate of their behaviours (in the same way that, for example, someone might acknowledge that a person with conflicting political views might be good dinner company, while consistently avoiding such situations in reality). This latter point also raises another desired characteristic of a measure of these latent positions, namely that they have predictive validity. If such a measure mapped out dimensional positions but did not explain or predict pain related behaviours, it would have little practical or clinical utility, and might simply reflect abstract truisms that patient or clinician have been taught. Finally, in terms of utility, it is important that measurement of these latent positions be reliable and not dependent on the clinical dynamics that such measurements are intended to improve. As such, measurement with a standardized scale is preferable to simply obtaining the information qualitatively as part of routine clinical interview interviewing. The latter would be subject to clinician biases, or patients' desire to please their clinician, and would extend qualitative assessment in clinical settings which are already frequently time constrained.

5 Conclusion

Many extant philosophical views on the meaning of pain terms do capture important aspects of the content these expressions may communicate. However, we have suggested that it is important not to adopt too univocal a stance on the nature of this content, since pain terms can and do perform a range of different roles in natural language. A better approach would be to recognise the variety of dimensions of meaning which ordinary speakers associate with pain terms and which, we suggest, reflect underlying differences in the way that people conceptualise pain.

We have briefly outlined what a view taking seriously these different dimensions might look like (the "polyeidic" view) and have sketched how a view like this could have clinical utility. We suggest that, as part of a comprehensive pain assessment approach (which includes talking, listening, and observing patients, and also having them complete standardised questionnaires, tasks, and physiological measures), the polyeidic approach could improve patient-clinician communication about pain, building stronger, more trusting patient-clinician relationships. This in turn can improve a patient's openness to trying cognitive-based pain management techniques and enhance the potential efficacy of such treatments. Given the current well-rehearsed problems with surgical and pharmaceutical treatments for chronic pain, this would be a valuable result.[r] However, it is also clear that further interdisciplinary research on the polyeidic approach is needed, first to establish properly the operative dimensions of our ordinary concept of pain, second to evaluate how the stances an individual adopts on these dimensions can act to promote or to constrain the pain sufferer's ability to engage in top-down modulation of their experience, and third to explore what kinds of psychoeducational interventions are most effective in mitigating harmful beliefs and enhancing those that are helpful.

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[r] For the outcomes associated with surgical interventions see, eg,: Taylor, R.S., Taylor, R.J. The economic impact of failed back surgery syndrome. *British Journal of Pain.* 2012; 6: 174-181. See also Brox J, Nygaard O, Holm I, Keller A, Ingebrigsten T, Reikeras O. Four-year follow-up of surgical versus non-surgical therapy for chronic low back pain. *Ann Rheum Dis.* 2010; 69: 1643-1648. For outcomes associated with long-term opioid medication, see eg: Chou R, Deyo R, Devine B, et al. *The effectiveness and risks of long-term opioid treatment of chronic pain.* Evidence Report/Technology Assessment, Agency for Healthcare Research and Quality. 2014; No.218. https://www.ncbi.nlm.nih.gov/books/NBK258809/. Also Dowell M, Haegerich T, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain—United States, *JAMA.* 2016; 315:1624-1645.

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