An article 'Pain assessment in animals' was previously published in In Practice (Reid and others 2013). This short article aims to bring the reader up to date with what we consider to be significant advances in the field of pain assessment in companion animals.

In recent years, one particularly interesting development in the field of pain assessment is the use of facial expression to detect and evaluate acute pain in animals. Indeed, the universality of the ‘pain face’ has been found to be relatively consistent across human development (from infancy to adulthood) and between people and animals (Chambers and Mogil 2015).

Facial expressions have been used for many years in human infant pain scales, one of the most used being the Wong-Baker scale (Wong and Baker 1988). Additionally, so called ‘grimace scales’ have been developed for rats (Sotocinal and others 2011), mice (Langford and others 2010), rabbits (Keating and others 2012), horses (Dalla Costa and others 2014) and cats (Holden and others 2014). The cat scale differs from these other scales in that it was developed using naturally occurring clinical pain compared with scales developed using an applied, short-lived painful stimulus (mouse, rat and rabbit), or immediate postoperative pain (horse). There are common features reported for all species: changes in ear position, muzzle and eyes (with the exception of the cat), but in all of these only two levels of pain can be distinguished; in contrast to the five levels detectable in babies using the Wong-Baker scale. This limits the use of these scales for evaluative purposes; however, adding the facial component to a cat behavioural scale (Fig 1, Box 1) has increased the sensitivity of the latter and accordingly enhances its clinical usefulness (Reid and others 2017b). This scale includes an intervention level to guide practitioners as to a cat’s requirement for analgesia, thus is a useful adjunct to their clinical judgement in a variety of scenarios, including postoperative care (Videos 1, 2). To date, facial markers of pain in animals have been restricted to acute pain, but there may also be a chronic pain ‘face’ which would make an interesting line of enquiry.

The complexity of the chronic pain experience has a bearing on its measurement, such that many of the instruments now used to measure human chronic pain are concerned primarily with measuring; not the pain per se, but rather its effect on the patient’s health-related quality of life (HRQL). In veterinary medicine, the measurement of chronic pain through its impact on HRQL continues to be an evolving area of research, as the incidence of chronic painful disease grows with increased longevity in companion animals. Awareness of the existence of chronic pain has improved its recognition, such that these days ‘slowing down’ is more often associated with chronic pain than old age. Osteoarthritis is the most common chronic...
painful disease in the dog. A number of scales have been published for its measurement (Brown and others 2007, Hercock and others 2009, Hielm-Björkman and others 2009, Walton and others 2013, Brown 2014) and management, the latter with a traffic light system to indicate the efficacy of therapeutic interventions (www.aim-oa.com). These tend to be primarily concerned with physical limitation rather than the effect on HRQL, a much broader concept including emotional and physical wellbeing, encompassing how the animal ‘feels’ about its circumstances.

Many other prevalent chronic diseases such as cancer, cardiovascular disease, neurological and dermatological conditions may also be associated with pain, but irrespective of whether pain is a feature, there is a need to be able to measure their impact on HRQL. This will enable practitioners to assess the therapeutic benefits of the plethora of drugs currently used and other treatment modalities, such as biologic and stem cell therapies that are under development. Additionally, with surgical interventions increasing in complexity and with the increasing trend towards hospice and palliative care for animals, never before has it been more important to be able to measure quality of life in an objective fashion backed by evidence-based medicine. HRQL assessment instruments typically take the form of structured questionnaires, which can be either generic or disease-specific. Disease-specific instruments may be more responsive to clinical change, but generic instruments measure the impact of anything that will affect quality of life, and can be valuable indicators of a range of impacts associated with disease and its treatment. They have been shown to provide an effective alternative when particular disease-specific instruments do not exist, and may be the only option when a patient is suffering from more than one condition (Wiseman-Orr and others 2004, 2006).

In human medicine, HRQL assessments are frequently used as patient-reported outcomes to measure the impact and effectiveness of therapeutic interventions. A patient-reported outcome represents the effect of the disease on health and functioning from the patient’s perspective, and is a report of the status of a patient’s health condition.

**Box 1: Guidance for use of the Glasgow Feline Composite Measure Pain Scale**

The Glasgow Feline Composite Measure Pain Scale (CMPS-Feline), which can be applied quickly and reliably in a clinical setting, has been designed as a clinical decision making tool for use in cats in acute pain. It includes 28 descriptor options within seven behavioural categories. Within each category, the descriptors are ranked numerically according to their associated pain severity and the person carrying out the assessment chooses the descriptor within category which best fits the cat’s behaviour/condition. It is important to carry out the assessment procedure as described on the protocol closely. The pain score is the sum of the rank scores. The maximum score for the seven categories is 20. The total CMPS-Feline score has been shown to be a useful indicator of analgesic requirement and the recommended analgesic intervention level is five out of 20. To familiarise yourself with the scale, assess the behaviour of the cat in videos 1 and 2.

![FIG 1: Feline Composite Measure Pain Scale for the measurement of acute pain in cats](image-url)
that comes directly from the patient, without interpreta-
tion of the patient’s response by a clinician or anyone else.
Needless to say, it is impossible to have a patient-report-
ed outcome for animals. However, in human non-verbal
populations it is acceptable to use observer reports, but
only where these include behaviours that can be observed
(FDA 2009). For example, an owner cannot validly report
a dog’s pain intensity, but can report behaviours thought
to be caused by pain. Similarly, for this reason, asking an
owner to rate their dog’s HRQL on a zero to 10 scale can-
not be regarded as a valid measure, but a questionnaire
instrument that draws such a conclusion from owner-
reported observations of behaviour can be. Currently,
there is only one instrument [VetMetrica HRQL for dogs]
that adopts this approach (Reid and others 2013a, b,
2017a), and focuses on how the dog ‘feels’ about its cir-
cumstances, thus providing a more complete picture of an
animals ‘true experience’.

The strength of the emotional human-animal bond has
huge implications for instrument development and the
opportunity for respondent bias cannot be underestimat-
ed. Accordingly, careful construction of the questionnaire
to minimise such bias, using established techniques for
structured questionnaire design (Streiner and Norman
1995), becomes much more important than may be the
case for the acute pain tools, as the proxy (veterinary sur-
geon or nurse) is less likely to have a strong emotional
bond with the animal.

It stands to reason that how an animal feels about its situ-
ation will vary with its breed, age and individual circum-
stances. For example, the opportunity of a long romp on a
windswept beach can be perceived in one way by an ener-
getic young Labrador retriever, and perceived entirely dif-
fently by an elderly cavalier King Charles spaniel that
has been raised as a ‘lap dog’. This has implications for
the practical interpretation of scores obtained using any
instrument. As a result and wherever possible, age and
breed population ‘norms’ should be available for com-
parison to aid interpretability of the scale. Defining these
requires a large number of dogs. Currently, interpret-
ability of the Vetmetrica HRQL for dogs makes use of age
norms for comparative purposes, which will be extended
to include breed norms as these data become available,
and the minimum important difference (Fig 2). The mini-
imum important difference is the difference in scores that
gives an indication of a change that is likely to be clinically
relevant. For example, it might help you make a decision
to either persevere with a treatment because there is good
evidence it is working, or indeed change it for an alterna-
tive. However, as with all things biological, nothing is black
and white so the figure should be treated accordingly.

Health-related quality of life measures can be single-
index scores that will provide information about a sin-
gle [or composite] domain, from which it can be inferred
whether the animal is better or worse, or they can be
represented by a multi-dimensional profile with scores in
different areas (domains) of quality of life. Since HRQL
is a complex multi-domain concept, one could argue that
this should be better represented by a multi-dimensional
profile to help understand the process of change and offer
more flexibility with analysis. Fig 2 represents this type of
input as used in Vetmetrica HRQL for the dog.

A substantial use for instruments to measure HRQL
exists within the veterinary practice, including raising the
profile of preventive veterinary medicine within a health
and wellness model, where their use in between routine
visits can be used to alert the clinician to a change in
health status; improving disease detection, including
chronic disease which is often unrecognised and unre-
ported; effectively monitoring subtle indicators of clinical
change in response to treatment and identifying a humane
endpoint for individual dogs.

![Graph showing HRQL output for a four-year-old mixed-breed dog diagnosed with osteoarthritis.](image)

**Fig 2**: Example of VetMetrica HRQL output for a four-year-old mixed-breed dog diagnosed with osteoarthritis. The first
data point is before treatment and thereafter the dog was treated with an NSAID. Each domain (energy, happiness,
comfort, calmness) is represented by a different colour. 50 = average healthy dog. The threshold line indicates the
value over which 70 per cent of healthy young dogs (under eight years old) will score. An increase in 10 points or over
in energy, happiness and comfort, or an increase of 15 points in calmness, indicates a clinically important difference.

**Score**

- Energetic and enthusiastic
- Happy and content
- Calm and relaxed
- Active and comfortable

**Assessment date**


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Conclusion
Developing pain assessment tools is a lengthy, complex and time-consuming process, but it is essential to build the evidence base that will allow us to advance our knowledge of the impact of all novel, and not so novel, therapies being developed to improve the welfare of animals suffering chronic disease, whether or not that is painful.

What does the future hold?
We anticipate some advances in the future for the measurement of acute pain, relating to more nuanced investigation of facial characteristics, but other than that, improvements are likely to be in relation to delivery. For example, electronic data capture and delivery via a software application.

However, we believe the real advances will be seen in the measurement of the impact of chronic disease, whether that be associated with pain or not. Development of HRQL tools is an iterative process by which existing tools are improved as more data become available, and new tools, both generic and disease specific, are developed for new populations and new contexts. We believe we are at the start of a fascinating journey as the availability of instruments for companion animals expands, to other companion animals such as cats, and in development of more disease specific components.

References
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