Eurasia Specialized Veterinary Publication

International Journal of Veterinary Research and Allied Science

ISSN:3062-357X

2026, Volume 6, Issue 1, Page No: 1-11

Available online at: www.esvpub.com/

Multimorbidity Changes the Meaning of Every Veterinary Treatment Decision: A Patient-Centered Clinical Architecture for Reconciling Competing Diseases, Drug Interactions, Functional Reserve, Treatment Burden, and Caregiver Capacity

Ana Rodrigues[1]*, Tiago Martins[1], Bruno Lopes[2]

[1]Department of Veterinary Internal Medicine and Multimorbidity, Faculty of Veterinary Medicine, University of Lisbon, Lisbon, Portugal.
[2]Department of Veterinary Clinical Pharmacology and Therapeutics, Faculty of Veterinary Medicine, University of Porto, Porto, Portugal.

***E-mail** ✉ ana.rodrigues@fmv.ulisboa.pt

ABSTRACT

Veterinary care becomes qualitatively different when an animal has several clinically important conditions because the value, risk, feasibility, and timing of each intervention depend on the rest of the patient's disease and care context. Single-disease reasoning can therefore produce locally appropriate recommendations that become collectively burdensome, interacting, contradictory, or poorly aligned with patient welfare and caregiver capability. This article develops an original non-empirical, patient-centered clinical decision architecture for companion-animal multimorbidity. It distinguishes disease–disease, drug–disease, and drug–drug interactions from simple coexistence; separates physiological reserve and functional status from chronological age; and treats treatment burden, monitoring burden, caregiver capability, and patient-caregiver priorities as clinically relevant constraints rather than secondary implementation concerns. The proposed architecture does not assign numerical weights or universal thresholds. Instead, it organizes multimorbidity decisions around clinically consequential interactions, competing therapeutic goals, noncompensatory constraints, revisable prioritization, and explicit reassessment after therapeutic change. Existing veterinary evidence supports the importance of multimorbidity, frailty, caregiver burden, medication feasibility, and dynamic monitoring, but does not establish a validated integrated decision instrument. The architecture is therefore intended as a structured synthesis that makes otherwise hidden trade-offs visible and empirically testable. Its principal boundaries are the predominance of dog and cat evidence, heterogeneous disease-specific literatures, incomplete evidence on deprescribing and multimorbidity-specific outcomes, and the need for prospective validation before clinical utility can be claimed.

Keywords: Multimorbidity, Veterinary internal medicine, Frailty, Treatment burden, Caregiver capacity, Clinical decision-making

Received: 14 October 2025
Revised: 08 January 2026
Accepted: 12 January 2026

How to Cite This Article: Rodrigues A, Martins T, Lopes B. Multimorbidity Changes the Meaning of Every Veterinary Treatment Decision: A Patient-Centered Clinical Architecture for Reconciling Competing Diseases, Drug Interactions, Functional Reserve, Treatment Burden, and Caregiver Capacity. Int J Vet Res Allied Sci. 2026;6(1):1-11.
https://doi.org/10.51847/ODWC0IDyOW

Introduction

Multimorbidity in companion animals is not merely the presence of several diagnoses. Recent longitudinal and network evidence in dogs and cats indicates that morbidities accumulate with age, occur in structured combinations, and can carry prognostic relevance rather than behaving as independent entries on a problem list [1–3]. Yet most treatment decisions are still operationalized through disease-specific recommendations, with each condition considered primarily through its own diagnostic targets, therapeutic options, and monitoring

requirements. This creates a mismatch between how disease is organized in guidance and how illness is experienced by the patient.

Complex geriatric care already requires coordination across disease control, function, quality of life, adverse effects, feasibility, and caregiver workload [4]. The central argument advanced here is therefore that multimorbidity changes the meaning of every treatment decision: an intervention that is reasonable for one disease cannot be judged fully until its consequences for other diseases, concurrent drugs, physiological reserve, functional status, monitoring demands, and caregiver capability are considered. The article develops a proposed clinical architecture for making those dependencies explicit. It does not replace disease-specific evidence, create a universal prioritization score, or claim prospective validation. Instead, it provides a structured way to identify when single-disease recommendations remain compatible, when they conflict, and when uncertainty or burden should alter sequencing, modification, or reassessment.

Why single-disease reasoning fails in multimorbidity

Single-disease reasoning assumes that a recommendation can be evaluated largely within the boundary of the condition for which it was developed. That assumption becomes unstable when diseases accumulate. In canine population data, multimorbidity is associated with prognosis, demonstrating that the number and combination of conditions can matter at the whole-patient level [1]. Network analyses further show that diagnoses form patterned relationships that vary with age and reported order of onset rather than appearing as statistically independent events [3]. These findings do not prove that one disease causes another or that every disease pair requires therapeutic modification, but they undermine the idea that a problem list can always be managed as a set of isolated modules.

The relevant clinical unit is therefore proposed to be the patient-care system: the animal, its current physiological and functional state, the active regimen, the caregiver who must execute that regimen, and the time over which benefits and harms may emerge. Disease-specific guidance remains necessary, especially when one problem is immediately life-threatening. Multimorbidity reasoning becomes necessary when otherwise defensible recommendations interact, compete for limited reserve, or exceed the practical capacity of the patient-caregiver unit.

Disease–disease interactions

Coexisting diseases should not be treated as automatically synergistic or automatically harmful. Veterinary studies show heterogeneous relationships: comorbidities in dogs with ischemic stroke were common without uniformly worsening measured outcomes; syringomyelia and myxomatous mitral valve disease in Cavalier King Charles spaniels did not show a simple severity relationship; and cardiomyopathy in cats undergoing subcutaneous ureteral bypass altered peri-procedural interpretation without functioning as an absolute contraindication [5–7]. These examples matter because they include null and context-dependent findings, not only associations that favor a comorbidity narrative.

For this architecture, a disease–disease interaction becomes clinically meaningful when coexistence changes interpretation, prognosis, treatment tolerance, monitoring, or priority. Mere co-occurrence is insufficient. A statistical association may reflect age, breed, shared predisposition, referral selection, or ascertainment rather than a causal interaction. Conversely, an interaction may be clinically important even when it does not increase mortality if it changes fluid management, anesthetic risk, symptom interpretation, or the acceptable intensity of treatment. The proposed architecture therefore separates “coexisting disease” from “decision-modifying disease interaction,” with the latter requiring an observable consequence for management or uncertainty.

Drug–disease interactions

Drug–disease interactions arise when the expected benefit or harm of a therapy becomes conditional on another disease, an altered physiological state, or a competing management requirement. The same intervention can therefore move from desirable to conditional, or from acceptable to disproportionately burdensome, without the indication itself disappearing. In cats undergoing subcutaneous ureteral bypass, for example, concurrent cardiomyopathy changes interpretation of fluid-related risk and peri-procedural management even though it does not automatically preclude intervention [7]. The principle is not that comorbidity creates a universal contraindication, but that another disease can alter the margin within which treatment remains acceptable.

This article proposes evaluating drug–disease interactions through four questions: whether expected benefit is preserved, whether vulnerability to adverse effects is altered, whether the treatment worsens a competing disease objective, and whether new monitoring is required to keep risk acceptable. Coordinated geriatric care supports this wider view of treatment decisions [4], but the four-question appraisal itself is proposed and requires validation. Importantly, absent evidence of interaction should not be converted into evidence of safety across species, disease severity, or clinical settings.

Drug–drug interactions

Polypharmacy creates another layer of conditionality, but interaction signals should be interpreted at the level at which they are demonstrated. In healthy cats, concurrent omeprazole altered aspects of clopidogrel metabolism without a parallel demonstrable reduction in measured platelet function, illustrating that a pharmacokinetic interaction does not automatically establish clinically important pharmacodynamic harm [8]. This distinction is especially important in multimorbidity, where stopping an effective drug solely because an interaction is theoretically plausible may be as inappropriate as ignoring a proven interaction.

Veterinary pharmacogenetics further shows that transporter-mediated interaction risk can depend on species, genotype, substrate, and inhibitor context; P-glycoprotein deficiency is therefore a model for why human interaction lists cannot be transferred mechanically to dogs and cats [9]. Rational medication review also requires asking whether every drug retains a defensible indication. Consensus guidance on gastrointestinal protectants demonstrates that evidence for routine use varies considerably by indication [10]. In the proposed architecture, drug–drug review therefore examines clinical consequence, susceptibility context, and continuing necessity rather than treating the simple number of drugs as a surrogate for interaction severity.

Competing therapeutic goals

Multimorbidity becomes most difficult when two individually reasonable goals cannot be pursued simultaneously without compromise. The conflict may involve survival versus comfort, rapid disease control versus adverse-effect risk, organ protection versus another organ's physiological needs, aggressive monitoring versus handling stress, nutritional optimization for one condition versus restrictions imposed by another, or maximal treatment intensity versus a caregiver's ability to deliver care. Coordinated geriatric practice already recognizes that function and quality of life may need to be considered alongside disease control [4].

Goal conflict should therefore be made explicit rather than hidden inside an apparently technical treatment choice. A concurrent condition may change procedural or fluid-management risk [7], and a medication with weak indication may add burden without sufficient expected benefit [10]. Neither observation creates a universal priority order. This article instead proposes that a goal should lose priority only when its marginal expected benefit is outweighed by a noncompensatory safety constraint, a clinically important conflict with another objective, or inability to execute the plan reliably.

Table 1 presents therapeutic conflicts that require trade-off, sequencing, simplification, or reversible uncertainty management.

Table 1. Therapeutic conflicts that require trade-off, sequencing, simplification, or reversible uncertainty management

Therapeutic conflict	What cannot be optimized simultaneously	Evidence that reveals the conflict	Reversible resolution and review point
Benefit–safety conflict	**Clinical tension:** Benefit persists; risk margin narrows **Patient/care conditions:** Concurrent disease, reserve	**Observed:** Toxicity, intolerance, destabilization **Safety limit:** No harm signal ≠ proven safety	**Resolution:** Modify intensity or sequence **Review:** Recheck threatened domain **Basis:** Proposed
Disease–disease conflict	**Clinical tension:** One goal may compromise another **Patient/care conditions:** Organ interaction, fluids, diet	**Observed:** Divergent control indicators **Safety limit:** Coexistence ≠ interaction	**Resolution:** Prioritize the time-critical goal **Review:** Reassess both diseases **Basis:** Proposed
Benefit–burden conflict	**Clinical tension:** Efficacy may exceed executable workload **Patient/care conditions:** Function, handling, caregiver capacity	**Observed:** Missed doses, distress, failed monitoring **Safety limit:** Burden ≠ treatment failure	**Resolution:** Simplify or substitute **Review:** Reassess feasibility and response **Basis:** Proposed
Low-value continuation	**Clinical tension:** Current indication is weak or obsolete	**Observed:** Limited current benefit	**Resolution:** Review dose, taper, substitution, or stopping

	Patient/care conditions: Regimen complexity	**Safety limit:** Withdrawal can carry risk	**Review:** Monitor recurrence or rebound **Basis:** Proposed
Uncertain net benefit	**Clinical tension:** Evidence cannot resolve competing goals **Patient/care conditions:** Severity, frailty, evidence quality	**Observed:** Discordant or incomplete information **Safety limit:** Uncertainty remains explicit	**Resolution:** Prefer reversible decisions **Review:** Define evidence that changes plan **Basis:** Proposed

Physiological reserve

Two animals with similar diagnoses can tolerate the same intervention differently because their capacity to absorb physiological stress is not identical. Veterinary frailty work provides several ways to operationalize this vulnerability. A clinically applicable canine frailty phenotype has shown prognostic value, canine geroscience has proposed a multidomain geriatric-syndrome framework, and a deficit-accumulation frailty index has been associated with mortality [11–13]. These approaches are related but not interchangeable: phenotype screening, multidomain conceptualization, and deficit accumulation measure different aspects of vulnerability.

Physiological reserve is therefore used here as a latent clinical concept rather than a directly measured quantity. Frailty, functional performance, body condition, organ function, recovery from recent illness, and tolerance of prior treatment may provide partial information about it. The architecture proposes that lower reserve should narrow the acceptable margin for cumulative treatment stress and increase the value of reversible changes and earlier reassessment. This does not mean that frailty creates an automatic ceiling on treatment, nor that chronological age should substitute for functional assessment. Existing canine data support vulnerability stratification, but they do not establish a universal reserve threshold for choosing or withholding therapy.

Functional status and frailty

Functional status describes what the animal can currently do; frailty describes vulnerability to stressors. They overlap, but neither should be reduced to age. Deficit accumulation can predict mortality even when chronological age is considered, supporting the proposition that vulnerability captures clinically relevant information not conveyed by age alone [13]. A phenotype-based screen may likewise identify a clinically recognizable state of reduced resilience [11]. However, the measures were developed in particular canine populations and should not be treated as universal species-independent cutoffs.

In multimorbidity decisions, functional decline has two roles. First, it can be an outcome that treatment is intended to improve or preserve. Second, it can be a constraint indicating that the patient may tolerate complicated medication schedules, repeated travel, fasting, restraint, rehabilitation, or adverse effects poorly. The proposed architecture therefore keeps function and frailty separate from disease count and from caregiver burden. A patient may have many stable diseases but preserved function, or few diagnoses with profound vulnerability. Preserving those distinctions prevents diagnostic complexity from being mistaken for physiological fragility and prevents frailty from being used as a shorthand justification for undertreatment.

Treatment burden

Treatment burden is the work and disruption created by care, not simply the number of prescribed interventions. Owners of dogs with chronic enteropathies report measurable caregiver burden, demonstrating that chronic veterinary treatment can impose costs outside conventional disease outcomes [14]. Qualitative work in the same clinical area further shows that medication administration, dietary management, nursing tasks, logistics, and communication can remain demanding even when disease appears comparatively stable [15]. In veterinary oncology, caregiver burden has also been associated with psychosocial disruption and treatment-related factors [16]. These studies differ in disease, method, and setting, so they do not establish one universal burden profile.

For multimorbidity, treatment burden is proposed as a distinct decision variable because burdens can accumulate across diseases even when each individual intervention is reasonable. The clinically relevant question is not whether care is “too much” in the abstract, but whether the combined workload threatens reliable execution, animal welfare, caregiver sustainability, or the expected value of lower-priority interventions. Burden should therefore prompt redesign rather than blame: simplification, sequencing, substitution, or explicit acceptance of trade-offs may preserve more important goals while reducing avoidable work.

Monitoring burden

Monitoring is beneficial only when the information produced can change management at an acceptable cost to patient and caregiver. Medication adherence work in cats shows that home treatment can fail because administration itself is difficult, particularly when the animal resists handling [17]. In feline diabetes, home blood glucose monitoring was acceptable to many selected owners, but uptake depended on willingness and practical capability rather than medical desirability alone [18]. A lower-intensity home-monitoring protocol showed that disease control can coexist with relapse and safety concerns [19].

Monitoring burden is therefore proposed as the combined work, stress, expense, and interpretive demand required to obtain clinically actionable information. More monitoring is not automatically better. A test that is accurate but difficult to obtain repeatedly, causes substantial handling distress, or rarely changes action may have lower practical value than a simpler measure linked to a clear decision. Conversely, safety-critical monitoring may remain non-negotiable even when burdensome. The relevant question is whether each monitoring task has an explicit decision consequence and whether the patient-caregiver unit can sustain it.

Because monitoring demands differ in actionability and burden, they are best represented as states requiring different responses rather than as a single intensity scale. **Table 2** presents monitoring functions that must be preserved, redesigned, reduced, or reconciled.

Table 2. Monitoring functions that must be preserved, redesigned, reduced, or reconciled

Monitoring function	Safety-critical	Administration-coupled	Action-poor	Discordant
Why monitoring exists	Omission may create material risk	Monitoring and dosing share handling demands	Data seldom change management	Measures imply different states
What creates burden	Toxicity, instability, low reserve	Resistance, skill, complexity	Stable disease, low decision sensitivity	Timing, error, multimorbidity
Observed failure	Actionable harm signals	Missing data or doses	Repeated non-actionable results	Clinical/test disagreement
Redesign option	Preserve; redesign delivery	Simplify technique/regimen	Reduce or space	Resolve before escalation
Safety check	Necessity does not erase burden	“Nonadherence” may reflect feasibility	Avoid missed deterioration	Biology versus measurement noise
Next review	Intensify if unstable	Recheck execution	Define escalation trigger	Repeat discriminating measure
Synthesis basis	Proposed	Proposed	Proposed	Proposed

Caregiver capability and adherence

Caregiver capability should not be reduced to motivation. In primary-care cats, incomplete medication courses were associated with practical administration barriers, including animal resistance [17]. This makes adherence a property of the treatment–animal–caregiver relationship rather than a stable characteristic of the owner. A technically ideal regimen may therefore be clinically fragile if it depends on skills, time, physical handling, finances, or routines that cannot be sustained.

Treatment burden data also show that chronic care can consume substantial caregiver effort even when the therapeutic plan remains medically appropriate [14]. Home-monitoring studies similarly indicate that willingness and practical ability shape whether repeated measurements are feasible [18]. The architecture therefore proposes capability as a dynamic constraint composed of understanding, technical skill, time, resources, emotional sustainability, and animal cooperation. Clinicians should therefore distinguish unwillingness from inability, and inability from temporary overload. When execution is unreliable, adding another medication or test may reduce the value of the entire plan. The appropriate response is first to redesign the regimen, not to label the caregiver as noncompliant.

Patient and caregiver priorities

Owners of diabetic cats report identifiable priorities, fears, and information needs concerning treatment and monitoring [20]. Those preferences matter because caregivers observe the animal between visits and perform most home treatment, yet owner preference cannot be treated as a direct substitute for animal welfare. Patient-centered veterinary care therefore requires two related but distinct judgments: what outcomes appear to protect the animal's comfort, function, and meaningful daily activity, and what care the caregiver is willing and able to provide.

A spectrum-of-care approach supports choosing among medically acceptable pathways rather than framing every decision as maximal intervention versus failure of care [21]. Caregiver-burden research further indicates that the experience of caring is shaped by multiple personal and contextual factors rather than disease severity alone [22]. The proposed architecture consequently treats priorities as constraints on choice, not as automatic vetoes over safety. When options are medically reasonable, caregiver priorities should influence selection. When a preferred option creates unacceptable animal harm or cannot achieve its intended clinical purpose, the conflict should be made explicit and alternative goals negotiated. This preserves both patient welfare and caregiver agency without assuming they are always identical.

A proposed multimorbidity decision architecture

The proposed architecture treats each treatment decision as conditional on three analytically separate fields: the patient state, the regimen state, and the care-delivery state. Patient state includes active diseases, interaction between diseases, current function, and physiological reserve. Regimen state includes expected benefit, adverse-effect risk, drug–disease and drug–drug interactions, monitoring requirements, and continuing indication. Care-delivery state includes caregiver capability, treatment burden, monitoring burden, and patient-caregiver priorities. Coordinated geriatric care supports the need to integrate these concerns [4], while frailty evidence supports preserving vulnerability as distinct from diagnosis count [11]. Owner-priority evidence supports explicit attention to the care-delivery context [20].

Adjudication is proposed to occur where these fields intersect. A treatment proceeds unchanged only when its expected benefit remains meaningful, no noncompensatory safety constraint dominates, the plan is executable, and competing goals remain acceptable. Otherwise the decision can be modified, sequenced, deferred, substituted, or stopped, with uncertainty recorded rather than disguised as precision. No numerical weights are assigned because current evidence does not justify universal trade-off coefficients.

The architecture is compressed visually in **Figure 1** so that evidence-supported inputs, proposed decision boundaries, constraining conditions, and reassessment loops remain distinguishable.

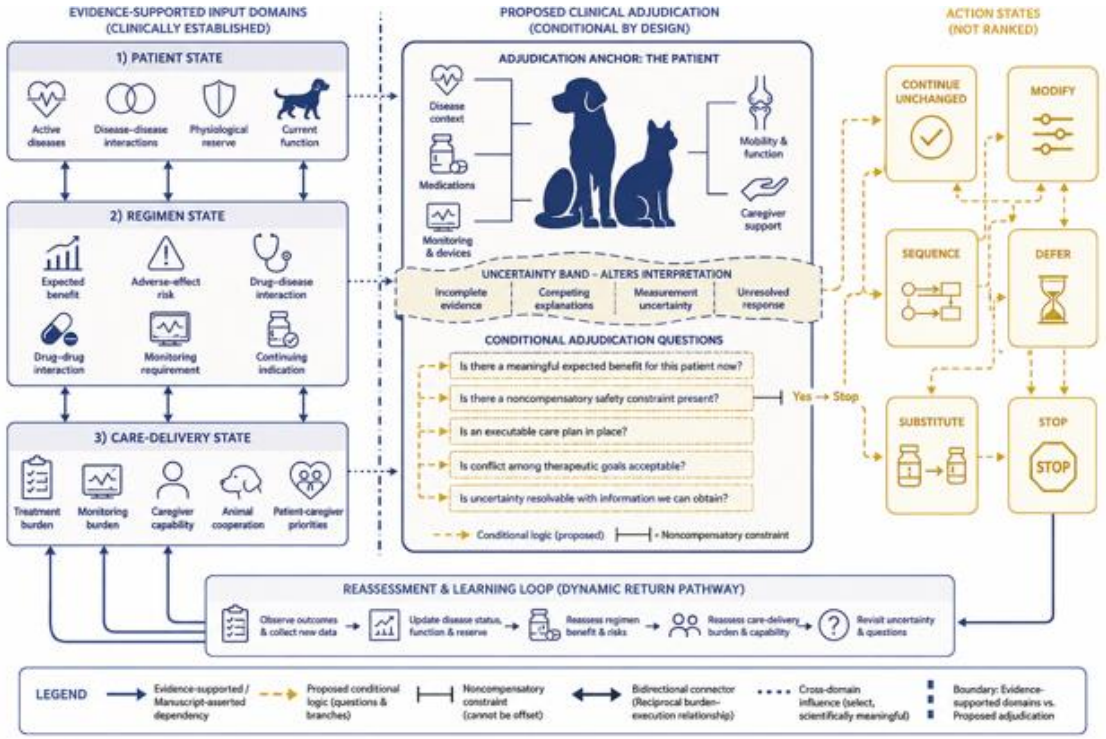

Figure 1. When a treatment remains reasonable only conditionally: adjudication across multimorbid patient, regimen, and care-delivery constraints

Prioritization of immediate and deferred problems

Prioritization is not equivalent to ranking diagnoses by severity. Veterinarians report heterogeneous use of spectrum-of-care practices, indicating that treatment intensity and sequencing vary across clinicians and contexts

[23]. Access constraints can further restrict which otherwise reasonable pathways are feasible [24]. In older animals, competing nutritional and medical needs illustrate why managing one domain can require compromise in another rather than simultaneous maximal optimization [25].

This article proposes separating immediate from deferred problems using consequence of delay, reversibility, interaction risk, and executability. Immediate problems are those for which delay risks serious or poorly reversible harm, rapid destabilization, or loss of a narrow therapeutic opportunity. A problem may be deferred when short delay is unlikely to materially worsen outcome and allows a higher-priority threat, regimen conflict, or caregiver overload to be addressed first. Deferral is therefore an active decision with a monitoring trigger, not abandonment. A stable disease can become immediate if another treatment destabilizes it, and an initially urgent problem can become lower priority after control. **Table 3** presents pairing time-critical multimorbidity problems with conditions that can be actively deferred.

Table 3. Pairing time-critical multimorbidity problems with conditions that can be actively deferred

Problem requiring action	Problem that may wait	Why delay changes harm	Observed basis	Sequencing move	Safeguard and trigger to reopen
Destabilizing threat	Stable lower-acuity problems	Rapid decline, low reserve	Worsening function/safety	Treat dominant threat	**Safeguard:** Urgency does not erase interactions **Trigger:** Reopen after stabilization **Basis:** Proposed
Time-sensitive risk	Wider-window problems	Irreversibility	Narrowing opportunity	Sequence promptly	**Safeguard:** Safe delay often uncertain **Trigger:** Predetermine escalation **Basis:** Proposed
Stable but burdensome	Low-yield regimen elements	Overload, handling stress	Execution failure	Simplify before adding care	**Safeguard:** Burden ≠ low clinical value **Trigger:** Reassess after simplification **Basis:** Proposed
Information-deficient	Decisions needing clarification	Test feasibility, competing explanations	Discordant evidence	Prefer reversible action	**Safeguard:** Uncertainty is not neutrality **Trigger:** Obtain action-changing information **Basis:** Proposed

Treatment modification and deprescribing

Modification should begin with a simple question: does each component of the current plan still earn its place? Consensus guidance on gastrointestinal protectants shows why continued medication should not be assumed appropriate merely because it was once started; indication and evidential support can vary substantially across uses [10]. In multimorbidity, this review becomes more important because marginally useful therapies can contribute disproportionately to interactions, administration complexity, and monitoring burden.

Deprescribing is used here broadly but cautiously. It may include dose reduction, tapering, discontinuation, substitution, route change, schedule simplification, or deliberate deferment of a lower-priority intervention. A spectrum-of-care approach supports choosing among acceptable alternatives rather than equating maximal intensity with appropriate care [21]. The architecture does not assume that fewer medicines are intrinsically better, nor does it import human deprescribing thresholds into veterinary practice. Essential therapies may remain burdensome but non-negotiable. Modification is proposed when expected benefit has diminished, risk has increased, execution has become unreliable, another goal has become dominant, or a safer way exists to achieve the same purpose. Every change should specify what worsening, rebound, or loss of control would trigger reconsideration.

Reassessment after therapeutic change

Multimorbidity decisions are provisional because both disease and treatment effects evolve. Repeated health screening in older cats demonstrates that clinically relevant conditions can emerge after an apparently healthy baseline [26]. Recovery from intermediate-acting glucocorticoids in dogs has also shown marked individual

variation, illustrating why physiological recovery cannot be inferred from a fixed generic interval [27]. These findings support time as a core decision dimension rather than an administrative follow-up detail.

Signals may also recover at different rates. In canine pancreatitis, clinical severity, biochemical markers, and ultrasonographic findings can follow discordant trajectories [28]. Conversely, a prospective insulin-titration protocol in dogs illustrates how serial monitoring can be linked to explicit treatment adjustment rather than collected passively [29]. The architecture therefore proposes reassessment as a state-change test: Has expected benefit appeared? Has another disease destabilized? Has harm or burden emerged? Has caregiver capability changed? Is uncertainty smaller, or has new discordance appeared?

Figure 2 depicts this feedback logic because reassessment must determine whether the original treatment meaning remains valid after the patient's state has changed.

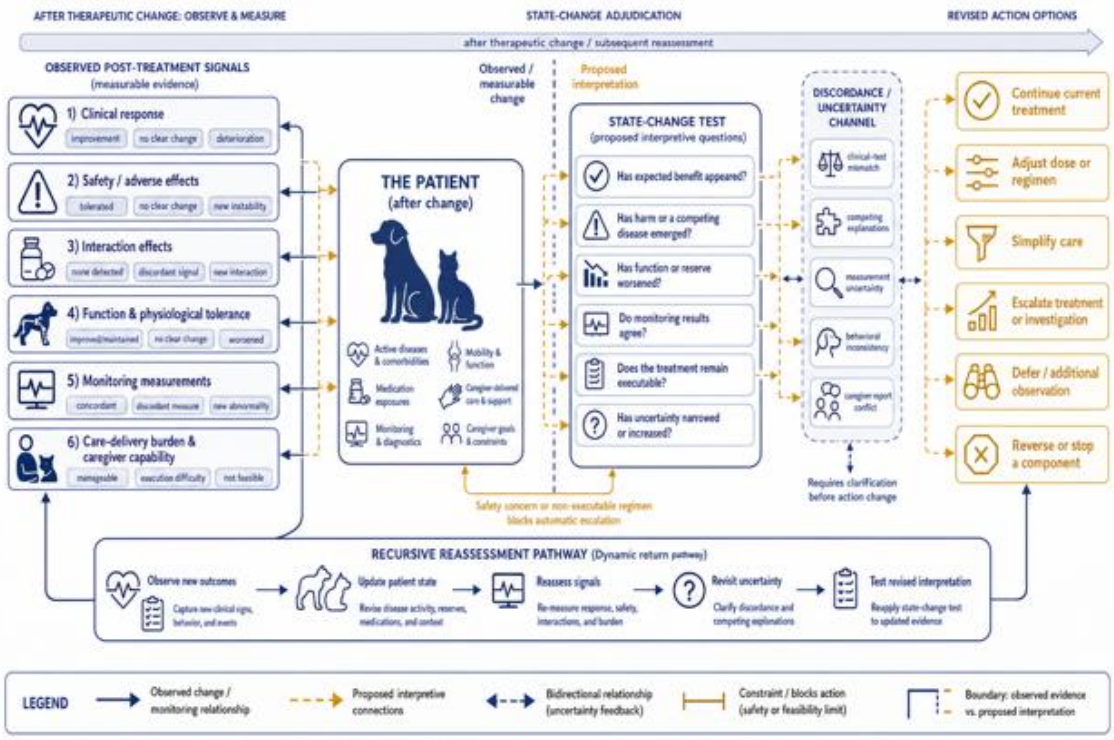

Figure 2. Reassessment as a state-change test after therapeutic change in veterinary multimorbidity.

Clinical Implementation

Implementation begins before prescribing. Medication-adherence evidence indicates that a plan can fail because the animal resists administration or the caregiver cannot deliver it consistently [17]. Clinicians should therefore ask how each treatment will actually be given, by whom, how often, under what handling conditions, and what will happen when a dose or measurement cannot be obtained. Veterinarian surveys show that comfort with spectrum-of-care practices varies, so implementation also depends on clinician habits and practice context [23].

Communication should make trade-offs visible rather than present one plan as self-evidently correct. Owners have specific treatment and monitoring priorities [20], while access limitations can constrain the technically preferred pathway [24]. A workable implementation sequence is therefore proposed: identify the dominant current goal; expose major interactions and noncompensatory constraints; test execution feasibility; select the least burdensome medically defensible plan; specify the monitoring information that would change action; and define a reassessment trigger. Documentation should distinguish evidence-supported recommendations from negotiated compromises and unresolved uncertainty. This workflow is not yet an implementation-tested protocol, and its feasibility may differ between primary-care and referral settings.

Validation priorities

The architecture requires validation at both component and whole-decision levels. Veterinary caregiver-burden research demonstrates that apparently intuitive constructs still require psychometric testing for reliability and validity [30]. Feline frailty work likewise shows the difference between feasibility of a proposed scale and

evidence sufficient for routine use [31]. These examples argue against assuming that face-valid domains are already measured adequately.

Validation should then examine distinct measurement properties rather than report a single global performance claim. A systematic review of acute pain instruments in dogs and cats illustrates how validity, reliability, measurement error, and responsiveness can differ across tools and species [32]. Diagnostic machine-learning work in canine cardiology similarly demonstrates that technical discrimination can be assessed rigorously without establishing downstream clinical benefit [33]. For this architecture, prospective studies should test reproducibility of domain assessments, inter-clinician agreement, temporal responsiveness, species and setting transferability, and whether architecture-guided decisions differ meaningfully from usual care. External validation, decision-impact studies, caregiver and patient-centered outcomes, and implementation research would be required before clinical utility or effectiveness could be claimed.

Conclusion

Multimorbidity makes treatment meaning conditional. A therapy cannot be judged only by the disease that justifies it; its value also depends on interacting diseases and drugs, reserve, function, burden, caregiver capability, competing priorities, and how those conditions change over time. The clinical architecture proposed here makes these dependencies explicit without converting them into an unsupported score or universal hierarchy. It separates coexistence from clinically meaningful interaction, preserves noncompensatory safety constraints, permits deliberate deferment and modification, and treats reassessment as part of the decision itself. Its principal contribution is therefore organizational rather than predictive: it provides a veterinary-specific structure for making complex trade-offs visible, discussable, and testable. The architecture remains a proposed synthesis centered mainly on companion-animal evidence and requires prospective, species-sensitive validation before its clinical utility can be established.

Acknowledgments: None

Conflict of Interest: None

Financial Support: None

Ethics Statement: None

References

1. Foreman ER, Corlin L, Creevy KE, Hoffman JM, Dog Aging Project Consortium. Multimorbidity as a predictor of mortality in companion dogs. Geroscience. 2026. Online ahead of print. doi:10.1007/s11357-026-02342-4
2. Pye CR, Dowgray NJ, Eyre K, Pinchbeck G, Hughes DM, Moniot D, et al. Patterns of morbidity, multimorbidity, and mortality in aging cats: Findings from seven years of the Cat Prospective Ageing and Welfare Study. Front Vet Sci. 2026;13:1813450. doi:10.3389/fvets.2026.1813450
3. Fang A, Kumar L, Creevy KE, Promislow DEL, Ma J, Dog Aging Project Consortium. Constructing the first comorbidity networks in companion dogs in the Dog Aging Project. PLoS Comput Biol. 2025;21(8). doi:10.1371/journal.pcbi.1012728
4. Carmack T. Managing comorbidity: Coordinating care for complex geriatric cases. Vet Clin North Am Small Anim Pract. 2026;56(2):419-30. doi:10.1016/j.cvsm.2025.09.029
5. Danciu C-G, Gonçalves R, Caldero CJ, Posporis C, Espinosa J, de Decker S, et al. Comorbidities, long-term outcome and poststroke epilepsy associated with ischemic stroke—a multicenter observational study of 125 dogs. J Vet Intern Med. 2025;39(1). doi:10.1111/jvim.17291
6. Bach MBT, Stougaard CL, Thøfner MS, Reimann MJ, Westrup U, Koch J, et al. Relationship between syringomyelia and myxomatous mitral valve disease in Cavalier King Charles spaniels. J Vet Intern Med. 2024;38(2):904-12. doi:10.1111/jvim.17018

7. Cassou C, Plante C, Vachon C, Boot G, Juette T, Dunn M. Characterization and outcomes of cats with cardiomyopathy undergoing subcutaneous ureteral bypass device placement. J Vet Intern Med. 2026;40(4). doi:10.1093/jvimsj/aalag127
8. Plante C, Lee PM, Haines JM, Nelson OL, Martinez SE, Court MH. The effect of concurrent clopidogrel and omeprazole administration on clopidogrel metabolism and platelet function in healthy cats. J Vet Intern Med. 2024;38(6):3206-14. doi:10.1111/jvim.17198
9. Mealey KL, Owens JG, Freeman E. Canine and feline P-glycoprotein deficiency: What we know and where we need to go. J Vet Pharmacol Ther. 2023;46(1):1-16. doi:10.1111/jvp.13102
10. Marks SL, Kook PH, Papich MG, Tolbert MK, Willard MD. ACVIM consensus statement: Support for rational administration of gastrointestinal protectants to dogs and cats. J Vet Intern Med. 2018;32(6):1823-40. doi:10.1111/jvim.15337
11. Russell KJ, Mondino A, Fefer G, Griffith E, Saker K, Gruen ME, et al. Establishing a clinically applicable frailty phenotype screening tool for aging dogs. Front Vet Sci. 2024;11:1335463. doi:10.3389/fvets.2024.1335463
12. McKenzie BA, Chen FL, Gruen ME, Olby NJ. Canine geriatric syndrome: A framework for advancing research in veterinary geroscience. Front Vet Sci. 2022;9:853743. doi:10.3389/fvets.2022.853743
13. Banzato T, Franzo G, Di Maggio R, Nicoletto E, Burti S, Cesari M, et al. A frailty index based on clinical data to quantify mortality risk in dogs. Sci Rep. 2019;9(1):16749. doi:10.1038/s41598-019-52585-9
14. Stumpf C, Pape C, Zablotski Y, Busch K. Caregiver burden in owners of dogs with chronic enteropathies—a survey-based assessment. J Vet Intern Med. 2026;40(4). doi:10.1093/jvimsj/aalag128
15. Lyngby JG-H, Nielsen LN, Ankerkilde S, Bentzen AW, Bjørnvad C, Lund TB, et al. Chronic enteropathy in dogs affects the quality of life in both dogs and their owners—are veterinarians proficient in handling the caregiver burden? Front Vet Sci. 2025;11:1488917. doi:10.3389/fvets.2024.1488917
16. Shaevitz MH, Tullius JA, Callahan RT, Fulkerson CM, Spitznagel MB. Early caregiver burden in owners of pets with suspected cancer: Owner psychosocial outcomes, communication behavior, and treatment factors. J Vet Intern Med. 2020;34(6):2636-44. doi:10.1111/jvim.15905
17. Odom TF, Riley CB, Benschop J, Hill KE. Medication compliance by cat owners prescribed treatment for home administration. J Vet Intern Med. 2025;39(1). doi:10.1111/jvim.17298
18. Hazuchova K, Gostelow R, Scudder C, Forcada Y, Church DB, Niessen SJM. Acceptance of home blood glucose monitoring by owners of recently diagnosed diabetic cats and impact on quality of life changes in cat and owner. J Feline Med Surg. 2018;20(8):711-20. doi:10.1177/1098612X17727692
19. Gottlieb S, Rand JS, Anderson ST. Frequency of diabetic remission, predictors of remission and survival in cats using a low-cost, moderate-intensity, home-monitoring protocol and twice-daily glargine. J Feline Med Surg. 2024;26(4):1098612X241232546. doi:10.1177/1098612X241232546
20. Albuquerque CSC, Bauman BL, Rzeznitzeck J, Caney SMA, Gunn-Moore DA. Priorities on treatment and monitoring of diabetic cats from the owners' points of view. J Feline Med Surg. 2020;22(6):506-13. doi:10.1177/1098612X19858154
21. Englar RE. Recasting the gold standard—part I of II: Delineating healthcare options across a continuum of care. J Feline Med Surg. 2023;25(12):1098612X231209855. doi:10.1177/1098612X231209855
22. Joo S, Park H, Chun MS. Pet caregiver burden in South Korea: Key influences and the implications for veterinarians. BMC Vet Res. 2025;21(1):331. doi:10.1186/s12917-025-04787-9
23. Dolan ED, Slater MR. Veterinarians' self-reported behaviors and attitudes toward spectrum of care practices. Animals (Basel). 2024;14(10):1416. doi:10.3390/ani14101416
24. Blackwell M. Bridging gaps in veterinary care: Equity, access, and innovation. Vet Clin North Am Small Anim Pract. 2024;54(6):859-67. doi:10.1016/j.cvsm.2024.07.013
25. Churchill JA, Eirmann L. Senior pet nutrition and management. Vet Clin North Am Small Anim Pract. 2021;51(3):635-51. doi:10.1016/j.cvsm.2021.01.004
26. Mortier F, Daminet S, Marynissen S, Smets P, Paepe D. Value of repeated health screening in 259 apparently healthy mature adult and senior cats followed for 2 years. J Vet Intern Med. 2024;38(4):2089-98. doi:10.1111/jvim.17138
27. Del Baldo F, Corsini A, Tardo AM, Tirolo A, Sapignoli A, Tumbarello M, et al. Hypothalamic-pituitary-adrenal axis recovery after intermediate-acting glucocorticoid treatment in client-owned dogs. J Vet Intern Med. 2024;38(2):942-50. doi:10.1111/jvim.16979

28. Mitchell L, Wang S, Lawver J, Cridge H. Serial monitoring of pancreatic lipase immunoreactivity, C-reactive protein, abdominal ultrasonography, and clinical severity in dogs with suspected pancreatitis. J Vet Intern Med. 2024;38(2):987-94. doi:10.1111/jvim.17020
29. Tardo AM, Fleeman LM, Fracassi F, Berg AS, Guarino AL, Gilor C. A dose titration protocol for once-daily insulin glargine 300 U/mL for the treatment of diabetes mellitus in dogs. J Vet Intern Med. 2024;38(4):2120-8. doi:10.1111/jvim.17106
30. Spitznagel MB, Mueller MK, Fraychak T, Hoffman AM, Carlson MD. Validation of an abbreviated instrument to assess veterinary client caregiver burden. J Vet Intern Med. 2019;33(3):1251-9. doi:10.1111/jvim.15508
31. Colleran EJ, Delgado MM, Ren Y, German AJ, Gruen ME, Gunn-Moore DA, et al. A non-randomized pilot study to test the feasibility of developing a frailty scale for pet cats. Front Vet Sci. 2025;12:1549566. doi:10.3389/fvets.2025.1549566
32. Lee J, Steagall PV. A systematic review of acute pain scoring instruments and their measurement properties in cats and dogs. J Vet Intern Med. 2026;40(1). doi:10.1093/jvimsj/aalaf062
33. McDonald A, Novo Matos J, Silva J, Partington C, Lo EJY, Luis Fuentes V, et al. A machine-learning algorithm to grade heart murmurs and stage preclinical myxomatous mitral valve disease in dogs. J Vet Intern Med. 2024;38(6):2994-3004. doi:10.1111/jvim.17224