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Department of Agricultural, Food, and Resource Economics
MICHIGAN STATE UNIVERSITY

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The Veterinary Professional Associate Financial Model: Shelter Practice

James W. Lloyd, DVM, PhD
Donna L. Harris, DVM, MBA, MS
David M. Smith, PhD

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For inquiries, please contact:
James W. Lloyd (james.lloyd@animalhealtheconomics.com)

Abstract

The U.S. veterinary medical profession is facing a capacity crisis, struggling to meet the growing demand for services. Introducing a new mid-level provider role, the Veterinary Professional Associate (VPA), could bridge the gap between veterinarians and technicians, potentially helping to alleviate this issue. This project aimed to define potential VPA roles and responsibilities and assess their impact on workflow, productivity, and financial performance in a companion animal, non-profit shelter practice. Based on expert interviews, we developed partial budget models to estimate the expected financial impact of VPAs. Under our model assumptions, adding one full-time equivalent (FTE) VPA significantly improved financial performance and increased throughput. These findings suggest that VPAs could be a viable solution to help address the capacity issues in veterinary medicine. Similar to successful implementations of physician assistants and nurse practitioners in human medicine, VPAs may enhance practice capacity and client satisfaction, improve patient outcomes and animal welfare, and improve practice financial performance. Further research and real-world implementation are needed to validate these results and ensure the successful integration of VPAs into veterinary care.

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Introduction

Capacity in the veterinary medical profession is currently insufficient to meet the demand for veterinary services in the U.S. [1,2,3] This gap is most frequently experienced as inadequate access to care in companion animal, food animal, and equine practice, but public practice, industry, academia, and other sectors are negatively impacted as well. Although seemingly acute, the shortage is not new.[4] Along with expanding educational programs to train more veterinarians and veterinary nurses/technicians, it has been suggested that creating a new class of professionals, a mid-level provider, should also be considered.[1]

First recommended in 2009 by faculty at the College of Veterinary Medicine and Biomedical Sciences at Colorado State University,[5] a mid-level provider (or veterinary professional associate – VPA) could bridge the gap between veterinary nurses/technicians and veterinarians. Similar in concept to the physician's assistant from human medicine, a mid-level provider has since been recommended by several additional authors,[6,7,8,9,10] and a first-of-its-kind Master in Veterinary Clinical Care (MVCC) academic program has been created at Lincoln Memorial University's College of Veterinary Medicine.[11] To further consider this idea, this project was designed to identify likely VPA roles and responsibilities and to estimate the potential impacts of the VPA on workflow, productivity, and financial performance in companion animal practice. Although general practice, specialty practice, and non-profit shelter practice were all analyzed, this report will focus on only the non-profit shelter practice.

Background/Literature – Mid-level human medicine providers, such as nurse practitioners (NPs) and physician assistants (PAs), have been shown to increase productivity and improve patient outcomes in human medicine. According to a report by Medical Economics, mid-level providers (MLPs) can substantially increase capacity in a primary care practice.12 Their deployment can positively impact a medical practice by enhancing patient care and expanding appointment availability and practice hours. This, in turn, helps lower fixed costs per patient and boosts profitability for the practice owner. Data analyzed by the Medical Group Management Association reveals that financial performance improves when human medical practices employ non-physician providers.13

The benefits of deploying mid-level providers extend beyond improved bottom lines. Reviewing 40 years of literature on the use of PAs within emergency departments in the United States, it was found that working alongside emergency care physicians, mid-level providers have helped meet growing patient demand and receive favorable patient satisfaction scores.14 Mid-level providers can manage lower acuity visits and fill gaps in areas such as telehealth and routine care, freeing up physicians for more complex cases. The evidence for these benefits is substantial. In a review of randomized controlled trials across numerous countries, researchers concluded that mid-level health workers enhance patient care, service cost-effectiveness, efficiency, and general patient satisfaction with the overall quality of care provided.15

Proper planning must take place to derive benefits from deployment of mid-level health providers in human medicine. The World Health Organization has advanced the deployment of

mid-level providers to expand access and affordability to healthcare worldwide. However, it notes that they need to be well-embedded in the system and receive adequate training, support, recognition, and pay.16 To fully leverage their benefits, MLPs should be included in the overall planning of the health practice, whether general or specialty.17

There are also discernible costs to employing a mid-level provider. Beyond salary and benefits, communication and coordination costs increase as MLPs work hand-in-hand with physicians.18 In solo physician practices, these costs may be particularly salient, potentially offsetting the benefits of MLPs.19,20 Thus, proper planning and deployment in smaller practices are especially important to realize the potential gains when hiring a mid-level provider.

Like their human medicine counterparts, deploying a mid-level practitioner (or VPA) in veterinary practices could improve outcomes. As noted above, demand for veterinary services is rising, but the supply of veterinarians is not keeping pace. This market dynamic puts upward pressure on the prices of veterinary services. By creating a mid-level practitioner, or VPA, in veterinary practices, excess demand may be effectively satisfied, and the rising costs of veterinary services could be mitigated. As found in human medicine clinical settings, mid-level practitioners could provide additional availability for appointments and practice hours, increasing profitability for the veterinary practice, extending access to care, and improving patient outcomes. This is likely to be true even within the context of most current practice acts and their requirements for veterinarian supervision. In the next section, we outline our approach to exploring the deployment of a VPA within a non-profit shelter practice setting.

Methods

Framework – For the non-profit shelter practice, a specific set of anticipated roles and responsibilities for veterinary professional associates was defined *a priori*, and these initial boundaries and assumptions were later calibrated based on consensus from thought-leader interviews. Before the interviews, we provided background information on the initial conditions and assumptions to the interviewees for context (see Appendix A).

Thought-leader interviews initially focused on the 2022-23 LMU-CVM Advisory Board. Additional interviews were conducted beyond the Board based on information that emerged as the project unfolded. In total, over 40 interviews were conducted. Along with developing consensus on the aforementioned set of boundary conditions and assumptions, these thought leaders provided essential information related to:

- Connections to non-profit shelter practices whose data were used as a foundation for the scenarios to be modeled, and
- Anticipated impacts of VPA on workflow, productivity, and efficiency, as well as qualitative factors of importance (e.g., leadership and expected non-financial outcomes).

Modeling – A partial budget model was used to assess the potential impact of the VPA on practice financial performance.[21] In this approach, a planning and decision-making framework is used to compare the costs and benefits of alternatives faced by a business. Only changes in income and expenses resulting from implementing a specific alternative are considered; all

aspects that are unchanged by the decision are ignored. In short, partial budgeting allows analysis of how a particular decision will likely affect the financial performance of an entity, holding constant other factors.

Incorporated in the models for the current analysis are anticipated workflow impacts, including both productivity and efficiency, of adding one full-time equivalent (FTE)[a] VPA to a given practice type.[b] Model results provide estimates of profitability for various related scenarios. The robustness of these estimates was then evaluated through various break-even, sensitivity, and scenario analyses centered on key underlying assumptions.

Break-even analysis allows us to test our financial assumptions related to costs, along with workflow productivity. By pinpointing the break-even point, we identify potential weaknesses in the model, such as overly optimistic workflow productivity impacts or under-estimated costs. Sensitivity analysis is a technique used to assess how changes in a model's inputs impact its final results. In essence, it's a "what-if" scenario for a model, allowing exploration of how variations in data or assumptions might influence the outcome. This is essential in testing a model, as it reveals the relative importance of underlying assumptions and helps identify any

[a] For this study, a full-time-equivalent (FTE) was defined as 40 hours per week and 50 weeks per year. Note that FTE is not a person, but a way to quantify a certain amount of work done. It assumes a standard workweek and a full year of work, regardless of actual hours worked or time off taken. This is not the same as a full-time employee, which is an individual who works for a company on a regular basis, and whose hours may vary week to week, exceeding 40 hours at times and including paid time off for vacations, holidays, or sick leave. On an annual basis, full-time employees have individual work patterns, preferences, and needs that may not align perfectly with the standardized FTE concept.

[b] For purposes of this study and report, all suggested VPA activities are restricted to those that comply with the relevant practice act(s).

hidden vulnerabilities. Understanding how sensitive a model is to changes can establish greater confidence in its reliability and ensure its predictions hold weight under different conditions. Scenario analysis is a tool that expands a model beyond a single point forecast and delves into the realm of different plausible future scenarios, each with its own set of assumptions on time allocation and workflow productivity. By running the model through each scenario, we can observe how the projected benefits, costs, and hence net financial performance, of adding a VPA to the practice environment might change in a different – but not unlikely – situation.

The non-profit shelter practice model contained specific assumptions related to roles, responsibilities, and impacts on the workflow of hiring one FTE VPA. These model parameters were defined through second- and third-level interviews beyond the LMU-CVM Advisory Board and involved veterinary professionals actively engaged in the non-profit shelter practice sector. Using sector-specific factors enabled the capture of the expected impact of one FTE VPA on productivity and net financial performance.

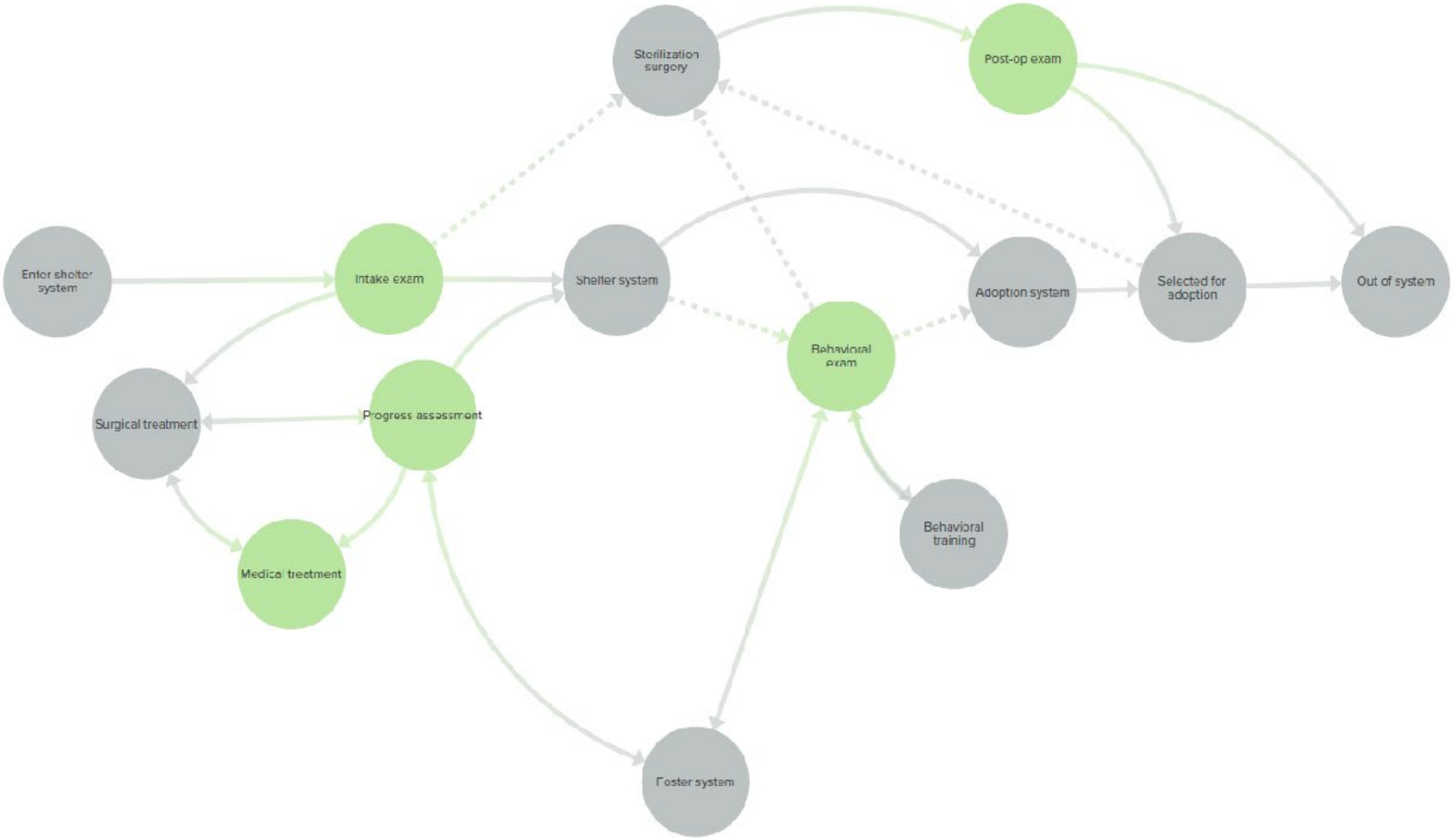
Results

Model Calibration – In the course of our thought-leader interviews, interviewees generally agreed with the list of roles and responsibilities developed *a priori* (see Appendix A). As defined, the patient care roles helped formulate specific quantitative assumptions for anticipated impacts on workflow and efficiencies to incorporate into the model. However, although there was overall agreement on the team leadership roles and responsibilities, the anticipated impacts on workflow and efficiencies were not easily quantified. Accordingly, these effects

were relegated to the category of qualitative effects that provide valuable context in assessing the modeling results.

Shelter systems model – Interviews suggested the following systems model for analysis of the shelter and its embedded veterinary practice, where the green circles depict their suggestions of the most significant opportunities for a positive financial and/or workflow impact by adding a VPA:

Shelter system model



A mathematical simulation was developed to model the key relationships in the shelter system and how adding one FTE VPA might impact them. Because of the wide variability between individual shelters, three distinct prototypes were developed as models for analysis based on – and using actual data from – three existing operating shelters. With a focus on veterinary operations, these three shelter practices provide realistic case studies for analyzing potential differences between small, medium, and large shelters. In addition, community context and organizational goals varied substantially between the three prototypes, as did specific operational structures.

Although substantial differences existed between the three distinct prototype shelters, all three participated in the national Shelter Animals Count (SAC) database.[22] To capture shelter-specific operational efficiencies for each of the three prototypes, the simulation model was initialized with one full year of SAC data from each shelter, respectively. Calculations were made to project the expected impact of adding one FTE VPA on throughput and financial performance, and this historical shelter performance was used as a starting point.

In addition to using the SAC database, other similarities were found between the three shelter prototypes. These included accommodating both dogs and cats, utilizing a foster system, and operating a non-profit business structure at a substantial annual financial loss (enabled by philanthropy). Each of the three shelters reported that sterilization surgeries are conducted 50 weeks of the year, and on average, one veterinarian can perform about 12 canine sterilization surgeries in a day and 16 for felines – if sterilization surgeries are their primary work activity.

Each of the three prototypes also anticipated that adding one FTE VPA would free up about 40% of an FTE veterinarian, and that the freed-up time would be allocated 50% to dog-related activities and 50% to cats.

Interviews with shelter personnel determined that estimated operating costs and fee structures were similar across prototypes. Consequently, the same parameters were used in all three models, as presented in Table 1.

Table 1. Financial parameters – Shelter Practice Models

All Shelter Prototypes – Financial Parameters	
Dogs	**Average**
Operating cost per day for healthy dogs*	$30
Operating cost per day for sick dogs*	$40
Internal cost of sterilization per dog**	$30
Dog adoption fee	$200
Compensation per dog transferred out	$0
Dog return-to-owner fee	$30
Cats	
Operating cost per day for healthy cats*	$20
Operating cost per day for sick cats*	$30
Internal cost of sterilization per cat**	$20
Cat adoption fee	$100
Compensation per cat transferred out	$0
Cat return-to-owner fee	$25

*Includes only variable/direct costs
**Includes non-veterinarian personnel costs

Finally, it was assumed that the number of animals available would be adequate for all three prototypes to meet any increased capacity resulting from adding one FTE VPA.

Small shelter/limited admission practice prototype

- Prototype Assumptions
    - Historical shelter performance – Using SAC data, the data presented in Table 2 are used to initialize the simulation of the small shelter model.

Table 2. Small shelter prototype SAC data – Shelter Practice Model

Small Shelter SAC Data – CY2022		
Live Intake	**Dogs**	**Cats**
Beginning Animal Count	88	98
Stray/At Large	24	175
Relinquished by Owner	385	438
Transferred in from Agency	599	700
Other Intake	11	89
Total live intake	1,107	1,500
Outcomes		
Adoption	868	1,130
Returned to Owner	10	1
Transferred to another Agency	112	106
Returned to Field	0	2
Other Live Outcomes	0	0
Ending Animal Count	88	113
Total live outcomes	1,078	1,352

    - Animal health – Based on interviews with shelter personnel, the parameters in Table 3 related to animal health are used in the model.

Table 3. Small shelter prototype animal health data – Shelter Practice Model

Small Shelter – Animal Health Parameters		
Dogs	**Current**	**With VPA**
Percent of all dogs presented that require sterilization surgery	42%	42%
Percent of dogs accepted from the public that require medical/behavioral intervention*	35%	40%**
Percent of transferred dogs that require medical/behavioral intervention*	25%	30%**
Average number of days sick dogs wait for evaluation or care (for all sick dogs)	3	1
Average number of days dogs are sick after evaluation (for all sick dogs)	14	12
Percent of sick dogs that are sent out for surgical or medical treatment	5.0%	2.5%
Cats		
Percent of all cats presented that require sterilization surgery	63%	63%
Percent of cats accepted from the public that require medical/behavioral intervention*	35%	40%**
Percent of transferred cats that require medical/behavioral intervention*	25%	30%**
Average number of days sick cats wait for evaluation or care (for all sick cats)	3	1
Average number of days cats are sick after evaluation (for all sick cats)	14	12
Percent of sick cats that are sent off-site for surgical or medical treatment	5.0%	2.5%

**" Medical" includes surgery (non-sterilization), illness, and/or injury.*
***Increases in these variables with a VPA result from an anticipated increased capacity in this specific shelter to accept animals requiring medical/behavioral intervention.*

- Other factors – From interviews with shelter personnel, the following unique estimates and expectations are also used in the small shelter prototype model.
  - The current overall average length of stay is estimated to be 24.0 days for dogs and 23.0 days for cats.

        - The average cost per case for dogs or cats sent off-site for surgical or medical treatment is estimated at $2,000.
        - 100% of the freed-up veterinarian time would likely be allocated to animals that require medical intervention.
        - Importantly, this shelter anticipates sending a currently employed veterinary nurse/technician through the VPA educational program. Note the following:
            - In this case, salary plus benefits for the one FTE VPA to be added is assumed to be only the anticipated compensation increase for that individual ($30,000).
            - No net increase in the total number of staff is expected with this scenario. It is assumed that sufficient excess capacity exists among other currently employed staff and operating systems so that the individual's current roles and responsibilities can be reassigned without hiring anyone new.
- Prototype Results – Based on these assumptions, the following results are obtained for the small shelter prototype:
    - By virtue of improved efficiencies and throughput, making it possible to accept a greater number of animals, total live outcomes are projected to increase,
        - For dogs, by 3.5% or 38 (from 1,078 to 1,116).
        - For cats, by 2.2% or 30 (from 1,352 to 1,382).

- Net estimated operating costs per live outcome[c] are projected to decrease,
  - For dogs, by 3.5% or $29 (from $810 to $782).
  - For cats, by 2.5% or $15 (from $613 to $597).
- The total cost of sending cases off-site for surgical or medical treatment is projected to decrease by 40%, or $28,569 (from $71,745 to $43,176).
- Total operating loss is projected to decrease by $4,009 (after accounting for the increased staff compensation required for the VPA).

Midsize shelter practice prototype

- Prototype Assumptions
  - Historical shelter performance – Using SAC data, the data presented in Table 4 are used to initialize simulation of the midsize shelter.

Table 4. Midsize shelter prototype SAC data – Shelter Practice Model

Midsize Shelter SAC Data – CY2022		
Live Intake	**Dogs**	**Cats**
Beginning Animal Count	205	233
Stray/At Large	1,777	3,084
Relinquished by Owner	1,032	1,459
Transferred in from Agency	434	241
Other Intake	339	237
Total live intake	3,787	5,254
Outcomes		
Adoption	2,004	3,900
Returned to Owner	619	89
Transferred to another Agency	90	43
Returned to Field	0	249
Other Live Outcomes	0	0
Ending Animal Count	209	232
Total live outcomes	2,922	4,513

[c] In this context, net estimated operating costs per live outcome is calculated as the difference between direct operating costs and revenues from adoption and return-to-owner fees.

- Animal health – Based on interviews with shelter personnel, the parameters presented in Table 5 related to animal health are used in the model.

Table 5. Midsize shelter prototype animal health data – Shelter Practice Model

Midsize Shelter – Animal Health Parameters		
Dogs	**Current**	**With VPA**
Percent of all dogs presented that require sterilization surgery	42%	42%
Percent of dogs accepted from the public that require medical/behavioral intervention*	35%	35%
Percent of transferred dogs that require medical/behavioral intervention*	25%	25%
Average number of days sick dogs wait for evaluation or care (for all sick dogs)	4	2
Average number of days dogs are sick after evaluation (for all sick dogs)	5	5
Cats		
Percent of all cats presented that require sterilization surgery	63%	63%
Percent of cats accepted from the public that require medical/behavioral intervention*	35%	35%
Percent of transferred cats that require medical/behavioral intervention*	25%	25%
Average number of days sick cats wait for evaluation or care (for all sick cats)	5	1
Average number of days cats are sick after evaluation (for all sick cats)	14	14

*" Medical" includes surgery (non-sterilization), illness, and/or injury.

- Other factors – From interviews with shelter personnel, the following unique estimates and expectations are also used in the midsize shelter prototype model.
    - The current overall average length of stay is estimated to be 24.0 days for dogs and 23.0 days for cats.

- Dogs and cats are rarely, if ever, sent off-site for surgical or medical treatment. Consequently, this feature is not included in the current midsize shelter model.
- Approximately 50% of the freed-up veterinarian time would likely be allocated to animals requiring surgical or medical intervention and the other 50% to sterilization surgeries.
- Annual compensation (salary plus benefits) for the one FTE VPA to be added is assumed to be $100,000.

- Prototype Results – Based on these assumptions, the following results are obtained for the midsize shelter prototype:
  - By virtue of improved efficiencies and throughput, making it possible to accept a greater number of animals, total live outcomes are projected to increase,
    - For dogs, by 24.3% or 710 (from 2,922 to 3,632).
    - For cats, by 15.8% or 713 (from 4,513 to 5,226).
  - Net estimated operating costs per live outcome[d] are projected to decrease,
    - For dogs, by 22.1% or $148 (from $672 to $524).
    - For cats, by 11.9% or $42 (from $356 to $313).
  - Total operating loss is projected to decrease by $28,619 (after accounting for the increased staff compensation required for the VPA).

[d] In this context, net estimated operating costs per live outcome is calculated as the difference between direct operating costs and revenues from adoption and return-to-owner fees.

- Break-even analysis results indicate that using the prototype assumptions, the net expected impact on operating loss would be $0 if the addition of one FTE VPA only freed up 31.0% of an FTE veterinarian. At this point, total live outcomes for dogs are projected to be increased by 18.8% (549 dogs) and 12.6% for cats (570 cats).

Large shelter practice prototype

- Prototype Assumptions
  - Historical shelter performance – Using SAC data, the data presented in Table 6 are used to initialize the simulation of the large shelter model.

Table 6. Large shelter prototype SAC data – Shelter Practice Model

Large Shelter SAC Data – CY2022		
Live Intake	**Dogs**	**Cats**
Beginning Animal Count	286	346
Stray/At Large	3,710	4,634
Relinquished by Owner	4,707	4,059
Transferred in from Agency	603	1,249
Other Intake	230	208
Total live intake	9,536	10,496
Outcomes		
Adoption	5,531	7,553
Returned to Owner	2,236	574
Transferred to another Agency	342	280
Returned to Field	0	461
Other Live Outcomes	1	0
Ending Animal Count	278	501
Total live outcomes	8,388	9,369

- Animal health – Based on interviews with shelter personnel, the following parameters related to animal health are used in the model.

Table 7. Large shelter prototype animal health data – Shelter Practice Model

Large Shelter – Animal Health Parameters		
Dogs	**Current**	**With VPA**
Percent of all dogs presented that require sterilization surgery	42%	42%
Percent of dogs accepted from the public that require medical/behavioral intervention*	35%	35%
Percent of transferred dogs that require medical/behavioral intervention*	25%	25%
Average number of days sick dogs wait for evaluation or care (for all sick dogs)	4	2
Average number of days dogs are sick after evaluation (for all sick dogs)	5	5
Cats		
Percent of all cats presented that require sterilization surgery	63%	63%
Percent of cats accepted from the public that require medical/behavioral intervention*	35%	35%
Percent of transferred cats that require medical/behavioral intervention*	25%	25%
Average number of days sick cats wait for evaluation or care (for all sick cats)	5	1
Average number of days cats are sick after evaluation (for all sick cats)	5	5

*" Medical" includes surgery (non-sterilization), illness, and/or injury.

- Other factors – From interviews with shelter personnel, the following estimates and expectations are also used in the large shelter prototype model.
  - The average length of stay is estimated to be 13.7 days for dogs and 23.0 days for cats.

        - Dogs and cats are rarely, if ever, sent off-site for surgical or medical treatment. Consequently, this feature is not included in the current large shelter model.
        - Approximately 50% of the newly available veterinarian time would likely be allocated to animals requiring surgical or medical intervention, and the other 50% to sterilization surgeries.

- Prototype Results – Based on these assumptions, the following results are obtained for the large shelter prototype:
    - By virtue of improved efficiencies and throughput, making it possible to accept a greater number of animals, total live outcomes are projected to increase,
        - For dogs, by 10.2% or 859 (from 8,388 to 9,247).
        - For cats, by 9.7% or 907 (from 9,369 to 10,276).
    - Net estimated operating costs per live outcome[e] were projected to decrease,
        - For dogs, by 12.7% or $34 (from $265 to $231).
        - For cats, by 8.9% or $30 (from $338 to $308).
    - Total operating loss was projected to decrease by $88,178 (after accounting for the increased staff compensation required for the VPA).
        - Break-even analysis results indicate that, using the prototype assumptions, the net expected impact on operating loss would be $0 if the addition of one FTE VPA only freed up 16.4% of an FTE veterinarian.

[e] In this context, net estimated operating costs per live outcome is calculated as the difference between direct operating costs and revenues from adoption and return-to-owner fees.

At this point, total live outcomes for dogs are projected to increase by 5.2% (a total of 437 dogs) and 5.7% for cats (a total of 532 cats).

Qualitative impacts – Similar to traditional general practice, a VPA in a leadership role with a shelter could manage both workflow and communications with clients, outside veterinarians, and departments within the shelter. They could also assume a degree of public relations activity related to medical cases, which is often used for fundraising. Improved communication with outside entities, including potential adoptees, could be directly reflected in increased donations.

Shelter clients (adopters) are sometimes frustrated by the wait times between when they adopt a pet and when they can bring their new pet home. Shelters often have policies that the animal must be sterilized before it leaves the shelter (in some states, this is required by law). This can create significant wait times between the adoption and when they leave the shelter due to a backlog of adopted animals waiting to be sterilized. Our interviewees believe that the use of a VPA would free up veterinarian time so animals could be sterilized in a more timely manner, thus reducing time spent in the facility.

One interviewee stated that leadership and coordination of a small healthcare team play an important role in how quickly medical issues are identified and treated in a shelter environment. Highly trained VPAs would be able to triage cases, improve medical case management, and manage care and treatment to improve patient outcomes. These changes

would improve job satisfaction in all workers as they are greatly affected by medical case outcomes.

Although shelters must be aware of financial operations, one of their primary goals is to assist in finding homes for as many pets as possible (live outcomes); increasing animal throughput is generally seen as a positive outcome, somewhat independent of cost. When analyzing the addition of a VPA from a purely financial aspect, the models suggest that the most substantial financial impact is when increased veterinarian bandwidth is allocated to alleviate a bottleneck in sterilization surgeries. However, a positive impact on live outcomes can be achieved – with or without a proportionate improvement in financial performance – when introducing the VPA enhances the identification and treatment of medical issues in the shelter.

Discussion

Most shelter models operate at a fiscal deficit, using grants and donations to subsidize and enable operations. Although financial performance is always considered, shelters' goals are also generally framed in non-revenue measures, such as the number of live outcomes, number of animals assisted medically, number of pets returned to owners, and/or reduction in euthanasia rates.

> "Some shelters are driven by the number of animals we can get through the shelter and into homes not by the finances. If the VPA can help get more pets into homes, it would be a win."
>
> *Shelter Chief Medical Officer*

Referring back to the shelter systems model, it is easy to visualize where shelter management personnel suggested that a VPA could impact their system, depending on individual needs and goals. For example, one shelter director mentioned that they believed a VPA would allow them to accept more medical cases from smaller shelters that lack any medical team. Another interviewed shelter operates with an extensive foster system, and the director believes the VPA could manage all the foster care families' communications across the spectrum, from simple medical questions to triage of medical occurrences. They believed this would save considerable veterinarian time and allow that time to be spent on surgical cases. It was recognized by some shelter management interviewees, however, that the role of a VPA would hinge upon building trust with the shelter veterinarians so they would relinquish appropriate duties to improve workflow.

> "We utilize an extensive foster system and would use the VPA to manage this system including triaging any medical issues. This would save an enormous amount of time for the veterinarian."
> *Small shelter Chief Medical Officer*

Beyond the systems model, other potential roles exist for the VPA within the broader shelter system. For example, one small shelter's chief medical officer (CMO) suggested that the VPA could go out into rural or underserved communities and provide education and preventive care if the practice act would allow it.

Because all these models represent shelters operating at a fiscal loss, it is important to emphasize that adding the VPA was expected to decrease the magnitude of those operating losses. When there is a decrease of "days in shelter" for an animal – whether a medical case or

not – there is an accompanying reduction in operating costs and, therefore, a decrease in the operating loss. Starting with this basic premise could help any shelter operation determine where a VPA might help reduce bottlenecks in the flow of these pets from entering the shelter to joining their "forever home."

When using these financial models to determine how adding a VPA might help a given shelter, the Shelter Animals Count (SAC)[22] data provide a critical starting point to determine which of the three prototype models developed for this project would be most applicable for comparison. From that point, shelter managers and CMOs should review the base assumptions for that particular model and project to their own situation accordingly.

As a final note on the shelter models, workplace culture and workforce satisfaction would be expected to increase by adding a VPA, much like the case with both general and specialty practices. Improved throughput resulting in a greater number of live outcomes would clearly improve job satisfaction. Meeting demand more effectively would likely reduce employee stress, enhance client satisfaction (due to shorter wait times, better communication, and improved case outcomes), and boost overall workforce morale.

Summary

The introduction of mid-level providers, or VPAs, into veterinary practice settings presents one promising solution to help address the profession's longstanding capacity issues. Drawing parallels with successful implementations in human medicine, this study highlights the potential

benefits of VPAs in increasing practice capacity (and client satisfaction), improving patient outcomes (and animal welfare), and enhancing practice financial performance.

The reliance on partial budgeting techniques provides a structured approach to assessing the potential financial implications of integrating VPAs into veterinary practices. By isolating changes in income and expenses resulting from the introduction of VPAs, the models offer valuable insights into the possible financial returns for practice owners. Certainly, it will be helpful to model additional practice types and scenarios in the future, but the robust nature of the current results provides an invaluable first step.

One important feature of the current study is the restriction of all VPA activities to those that comply with current relevant practice act(s). In moving forward, it could be of great interest to model additional scenarios where that particular constraint is relaxed as individual jurisdictions consider potential policy changes that would enable a broader scope of VPA activities. Of greatest interest, perhaps, might be the (in)ability of a VPA to establish a VCPR (i.e., see new clients/patients) and/or perform minor surgeries. The positive results obtained in the current study might well suggest additional benefits could be attained in the context of such broader-scope scenarios.

The thought-leader interviews conducted as part of the project contribute critical insights into the possible roles and responsibilities of VPAs, as well as the structural nuances of different practice settings. These interviews revealed a set of qualitative impacts on practice workflow

and efficiency, benefits not fully captured in the quantitative models. Similar qualitative, positive impacts related to workforce culture and satisfaction were noted. In fact, the VPA might well offer an attractive, entirely new opportunity for credentialed veterinary nurses/technicians to advance in their careers.

With regard to veterinary nurses/technicians, several of the thought-leader interviews revealed that situations already exist in veterinary medicine, across practice types, where individuals are currently performing many, if not all, of the roles and responsibilities identified in this project as appropriate for the VPA (within existing practice acts). In general, these are veterinary nurses/technicians who have been informally trained by other veterinary professionals in those practices or have completed one of the existing veterinary technician specialist (VTS) credentialing programs. From this perspective, the question might reasonably be raised as to why a new position is even warranted. In that context, two important points emerge:

- The fact that individuals are currently working in these roles strongly validates the need for and benefits of the VPA concept. Veterinary technician specialists add tremendous value to a practice, albeit in specialty-focused roles by design.
- Creating a new position will help to standardize the roles and responsibilities of the VPA, distinct from and complementary to existing VTSs. With this as a foundation, structured educational and credentialing programs can be developed around the broad base of competencies and knowledge necessary for consistent, predictable success as a VPA.

Regulatory environments and potential restraints notwithstanding, perhaps one of the biggest hurdles to successful implementation of a midlevel provider in veterinary medicine will be the inherent hesitation or reluctance of veterinarians to delegate clinical responsibilities. Unfortunately, veterinary nurses/technicians have not been effectively leveraged to achieve their full potential contribution to the profession. A similar approach to the adoption of possible VPA roles and responsibilities would seriously constrain their potential impact.

Overall, introducing a VPA could offer a significant step towards addressing the capacity challenges in the veterinary profession. By combining empirical analysis with expert insights, this study provides a comprehensive framework for evaluating the potential impact of VPAs on practice performance. However, further research and real-world implementation efforts will be necessary to validate the findings and ensure the successful integration of VPAs into veterinary care settings.

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Appendix A

Masters in Veterinary Clinical Care
Financial Model Project

Interview Background Information

Roles and Responsibilities – Based on your vision for the anticipated contributions of MVCC graduates in companion animal practice, please comment on – and critique – the following outline of expected roles and responsibilities.

Expected Roles and Responsibilities

Subject to existing practice acts and state regulations, we envision this new professional (MVCC graduate) to contribute in two distinct roles: patient care and team leadership. For each of these, the most likely responsibilities are as follows:

- *Patient care*
  - *Patient history taking*
  - *Physical examination*
  - *Advanced management of cases (in appropriate consultation with a veterinarian)*
    - *Diagnostic planning, procedures, and assessment*
    - *Treatment planning, procedures, and assessment*
    - *Nursing planning, procedures, and assessment*
    - *Client communication, including*
      - *Medical updates for existing cases*
      - *Client education at discharge*
      - *Case follow-up as appropriate*
- *Team leadership*
  - *Hospital operations*
    - *Provide staff leadership*
    - *Understand financial dimensions of practice management*
  - *Advanced coordination of care – develop and implement systems to effectively coordinate the contributions of various staff members, optimizing their respective roles/responsibilities*
    - *Receptionist*
    - *Veterinary assistant*
    - *Veterinary nurse/technician*
    - *Veterinary technician specialist*
    - *Veterinarian*
    - *Specialist veterinarians*
      - *Internal*
      - *External (referral)*