



AgEcon SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



The Veterinary Professional Associate Financial Model: General Practice

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

July 2024
Staff Paper Series #2024-008

For inquiries, please contact:
James W. Lloyd (james.lloyd@animalhealthconomics.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 general companion animal practice. Based on expert interviews, we developed a partial budget model to estimate the 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 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 increase practice profitability. Further research and real-world implementation are needed to validate these results and ensure the successful integration of VPAs into veterinary care.

Copyright ©2024 Michigan State University

All rights reserved This publication may not be reproduced, stored in any information or retrieval system, or transmitted in whole or in part, in any form or by any means electronic, mechanical, photocopying, recording or otherwise without the express written permission of Michigan State University.

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 general 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 physician 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 improving the bottom line. Reviewing seventeen years of data from emergency department visits in the United States, a study published in the International Journal of Emergency Medicine found that working alongside emergency care physicians, mid-level providers can reduce wait times and improve physicians' efficiency.¹⁴ Mid-level providers can manage lower acuity visits and fill in the gaps in areas such as telehealth and routine care, freeing up physicians to oversee more complex cases. The evidence for these benefits is substantial. In a systematic review of thirteen randomized controlled trials across numerous countries, researchers concluded that advanced nurse practitioners enhance patient care, service cost-effectiveness, efficiency, and general patient satisfaction with the overall quality of care provided.¹⁴

Proper planning must take place to derive benefits from the 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.¹⁵ To fully leverage their benefits, MLPs should be included in the overall planning of the health practice, whether general or specialty.¹⁶

There are also discernible costs to employing a mid-level provider within a medical practice setting. Beyond salary and benefits, there is an increase in communication and coordination costs as MLPs work hand-in-hand with physicians. In solo physician practices, these costs may be particularly salient, potentially offsetting the benefits of MLPs.¹⁷ Thus, proper planning and deployment in smaller practices are likely to be especially important to realize the gains achieved 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 in the introduction, demand for veterinary services is rising, but the supply of veterinarians is not keeping pace with the demand. 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 general small animal practice setting.

Methods

Framework – For the general 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 veterinary 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.¹⁸ 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 business' profitability, 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.^b Model results provide estimates of profitability for various related scenarios. The robustness of these estimates was then evaluated through various sensitivity and scenario analyses centered on key underlying assumptions.

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

^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).

model, as it reveals the relative importance of underlying assumptions and helps identify any 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 profitability, of adding a VPA to the practice environment might change in a different – but not unlikely – situation.

The general 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 general practice sector. Using sector-specific factors enabled the capture of the expected impact of one FTE VPA on productivity and profitability.

Results

Model Calibration – During 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.

When considering the general practice, thought leaders suggested that the not-for-profit model would not likely differ substantially from the privately owned or corporate models. As such, only a single general practice model is developed.

Prototype Assumptions – For the prototype, data were obtained from a 3.5 FTE DVM, full-service companion animal practice in the Midwest and affirmed through interviews with practice owners and managers. The following assumptions provided the foundation for the general practice model.

- Veterinarians can legally delegate activities to a VPA within the realm of roles and responsibilities described.
- Sufficient client demand exists to support the increased workflow as modeled.
- General practice parameters and veterinarian workflow assumptions are presented in

Table 1.

Table 1. Overall practice parameters and veterinarian workflow – General Practice Model

OVERALL PRACTICE PARAMETERS	
DVM Appointment Weeks Per Year	50
Average client transaction (new patient visit)	\$170
Average client transaction (recheck)	\$50
Average client transaction (preventative care)	\$125
Average client transaction (urgent care)	\$200
Average client transaction (surgery)	\$400
Ave length of new patient visit (min)	30
Ave length of recheck visit (min)	10
Ave length of preventive care visit (min)	20
Ave length of urgent care visit (min)	30
Ave length of surgery (min)	30
CURRENT DVM WORKFLOW	
% of DVM FTE spent with new patients	10%
% of DVM FTE spent with rechecks	10%
% of DVM FTE spent on preventive care	30%
% of DVM FTE spent with urgent care	15%
% of DVM FTE spent in surgery	25%
% of DVM FTE spent in comm + admin	10%

- Table 2 presents veterinarian weekly time allocation (on an FTE basis), the annual number of appointments, and the annual revenue generation assumptions before adding the VPA.

Table 2. Veterinarian time allocation (FTE basis) and revenue generation (pre-VPA) – General Practice Model

DVM FTE ALLOCATION (PRE-VPA)			DVM REVENUE (PRE-VPA)	
Activity Type	Avg Hours/Wk	% Time	No. of Appts	Revenue
New Patient	4.0	10.0%	400	\$68,000
Recheck	4.0	10.0%	1,200	\$60,000
Preventative	12.0	30.0%	1,800	\$225,000
Urgent	6.0	15.0%	600	\$120,000
Surgery	10.0	25.0%	1,000	\$400,000
Communication + Admin	4.0	10.0%	n.a.	n.a.
VPA Supervision	n.a.	n.a.	n.a.	n.a.
Totals	40.0	100%	5,000	\$873,000

Based on information obtained from interviews and confirmed with the prototype practice, a typical companion animal veterinarian allocates working hours between revenue-generating services, communicating with clients, and administrative duties. Assumptions for the percentage of time in each activity are presented in table 2. The revenue listed in the last column is based on ACT data from table 1.

- Assumptions related to adding one FTE VPA are presented in Table 3.

Table 3. VPA workflow assumptions – General Practice Model.

VPA WORKFLOW PARAMETERS		
VPA Work Weeks/Year (per FTE)		50
VPA Hours/Week (per FTE)		40
% of VPA FTE spent with new patients		0%
% of VPA FTE spent with rechecks		15%
% of VPA FTE spent on preventive care visits		35%
% of VPA FTE spent on urgent care visits		20%
% of VPA FTE spent doing surgery		0%
% of VPA FTE spent in comm + admin + leadership		30%
DVM Efficiency Factors	% FTE DVM in VPA supervision	10%
	% of FTE DVM comm and admin delegated to VPA	50%

When one FTE VPA is added to a practice, some DVM time must be allocated to supervising the VPA and/or cases the VPA is managing. In addition, a DVM and VPA will consult together on urgent care appointments to determine case management and coordination of care. Note that appropriate veterinarian supervision is a critical requirement for the delegation of responsibilities in most practice acts.

- Time allocation assumptions with the VPA are presented in Table 4.

Table 4. Time allocations with VPA – General Practice Model

FTE ALLOCATIONS WITH VPA				
Activity Type	DVM WITH VPA		VPA	
	Avg Hours/Wk	% Time	Avg Hours/Wk	% Time
New Patient	6.0	15.0%	0	0.0%
Recheck	2.0	5.0%	6.0	15.0%
Preventative	4.0	10.0%	14.0	35.0%
Urgent	8.0	20.0%	8.0	20.0%
Surgery	14.0	35.0%	0	0.0%
Communication + Admin	2.0	5.0%	12.0	30.0%
VPA Supervision	4.0	10.0%	n.a	n.a.
Totals	40.0	100.0%	40.0	100.0%

As the VPA assumes a certain amount of responsibility (for rechecks, preventive care, and urgent care appointments for clients with an established VCPR in this case), the VPA frees up some veterinarian time. It is assumed that adequate demand exists to fill appointments as modeled, and that veterinarian time can be reallocated to activities that generate higher revenue (primarily new patients, urgent care, and surgery). Ultimately, these new activities' related opportunities and exact mix will be practice-specific.

- Based on industry standards and thought-leader interviews, general cost assumptions included in the model are presented in Table 5.

Table 5. General cost structure – General Practice Model

GENERAL COST PARAMETERS	
COGS as % of Total Revenue	20%
Non-DVM Staff as % of Total Revenue	20%
DVM as % of Total Revenue	20%
DVM as % of VPA Revenue*	10%
VPA Salary+Benefits	\$100,000

**This cost is proposed as veterinarian compensation for the time allocated to VPA supervision.*

With the exception of the VPA salary and benefits, these variable expenses will increase in proportion to any increase in client revenues achieved when adding a VPA and are accounted for accordingly in the model. Note specifically that as workflow increases with the addition of one FTE VPA, it is expected that an increase of non-DVM staff (i.e., customer service representatives, veterinary assistants, and veterinary nurses/technicians) will also be necessary.

Prototype Results – Based on these assumptions, the following results are obtained:

- The expected revenue to be generated by the VPA is presented in Table 6. Note that this is not all new revenue to the practice; much of this revenue is currently being generated by a veterinarian, but is now shifted to the VPA.

Table 6. VPA revenue generation – General Practice Model

VPA REVENUE		
Appt Type	No. of Appts	Revenue
New	0	\$0
Recheck	1,800	\$90,000
Preventative	2,100	\$262,500
Urgent	800	\$160,000
Surgery	0	\$0
Totals	4,700	\$512,500

- Revenue generated by one FTE veterinarian after hiring the VPA is presented in Table 7.

Table 7. Veterinarian revenue generation (with VPA) – General Practice Model

DVM REVENUE WITH VPA		
Appt Type	No. of Appts	Revenue
New Patient	600	\$102,000
Recheck	600	\$30,000
Preventative	600	\$75,000
Urgent	800	\$160,000
Surgery	1,400	\$560,000
Totals	4,000	\$927,000

- When combining the VPA-generated revenue (from Table 6) with the DVM revenue generated post-VPA (from Table 7), a total revenue of \$1,439,500 is projected. Compared to the revenue generated solely by the one FTE DVM pre-VPA (\$873,000 – from Table 2), the expected revenue increase is \$566,500.
- New costs incurred because of the increase in caseload with the VPA are presented in Table 8.

Table 8. Additional costs incurred with VPA – General Practice Model

ADDITIONAL COSTS WITH VPA	
COGS	\$113,300
Non-DVM Staff	\$113,300
DVM - Base Production*	\$10,800
DVM - VPA Production**	\$51,250
VPA	\$100,000
Total	\$388,650

**This increased cost is a result of a net increase in veterinarian-generated revenue and would take the form of increased veterinarian compensation.*

***This increased cost is proposed as a method of compensating for the 10% of one veterinarian FTE allocated to VPA supervision and would take the form of increased veterinarian compensation.*

- Considering the expected increase in revenue of \$566,500, along with the additional costs of \$388,650 (from Table 8), the net expected impact on profitability from adding one VPA is **\$177,850** in this prototype. Note from Table 8 that, in addition to increased profitability for the practice, veterinarian compensation is projected to increase by $\$10,800 + \$51,250 = \$62,050$ based on the increased productivity of the practice.
- Along with reallocation of veterinarian time, the increase in revenue is due to an increase in appointments. Data presented in Table 2 suggest that 5,000 total appointments are expected in the pre-VPA situation. From Tables 6 and 7, the number of appointments is projected to be $4,700 + 4,000 = 8,700$ with one FTE VPA. Because some of these appointments involve rechecks, it is not likely that an additional 3,700 animals would receive care. However, the increase in access to care would be substantial.
- Sensitivity and Scenario Analyses – To assess the degree of robustness of the general practice model, a number of sensitivity and scenario analyses were performed.

- Sensitivity analysis was performed to assess the relative importance of key prototype assumptions, with all else held constant. The following individual results were obtained:
 - An increase of 10% in the total annual salary plus benefits for one FTE VPA (i.e., increased from \$100,000 to \$110,000) would be expected to result in net profitability for adding that VPA that is 5.6% less than the prototype (i.e., decreased from \$177,850 to \$167,850).
 - An increase of 10% in non-DVM staff expense as a percentage of total revenue (i.e., increased from 20% to 22%) would be expected to result in net profitability for adding one FTE VPA that is 6.4% less than the prototype (i.e., decreased from \$177,850 to \$166,520). This increase might be rooted in either a greater number of non-DVM staff or a higher compensation rate.
 - Lower fees so that, collectively, the average client transaction (ACT) for every appointment type was 10% lower for both the prototype and after adding one FTE VPA (i.e., new appointments were \$153 instead of \$170, rechecks were \$45 instead of \$50, etc.) would be expected to result in a net profitability for adding one FTE VPA that is 13.6% less than the prototype (i.e., decreased from \$177,850 to \$150,065).
 - A decrease of 10% in the proportion of filled appointments (i.e., decreased from 100% to 90%) would be expected to result in net

profitability for adding one VPA that is 17.6% less than the prototype (i.e., decreased from \$177,850 to \$150,065).

- Two alternative scenarios of potential interest were created for comparison to the prototype.
 - For the first alternative scenario, the question was posed, "What if the percentage of DVM FTE spent in VPA supervision was increased from 10% to 20%?" With all other assumptions the same as in the prototype, and with the balance of the DVM FTE allocated proportionately the same as in the prototype, the net expected impact on profitability from adding one FTE VPA in this scenario was \$139,026. This result is 21.8% lower than the prototype scenario result of \$177,850.
 - For the second alternative scenario, the question was posed, "What if the VPA's total clinical time was the same as the prototype, but only includes rechecks and preventative appointments?" Using a 2:1 ratio of time allocation between preventive appointments and rechecks for the VPA, and with all other assumptions the same as in the prototype, the net expected impact on profitability from adding one FTE VPA in this scenario was \$168,350. This result is 5.3% lower than the prototype scenario result of \$177,850.

- Qualitative impacts – As noted in the background section, adding a mid-level practitioner in human medical settings has increased patient satisfaction and improved medical outcomes. These benefits are expected to translate to the clinical veterinary setting as well. By freeing up capacity, the clinic can ensure that the animals receive timely care, which is especially critical in emergencies. Additionally, shorter wait times and improved communications can reduce the stress and anxiety of pet owners, which can lead to higher client satisfaction. Increasing appointment availability can also help improve patient outcomes by allowing for more frequent check-ups and early detection of health issues. This can lead to better treatment options and improved health outcomes for pets. Furthermore, by providing more appointment slots, a practice can accommodate more clients and patients, increasing client satisfaction and improving animal welfare. Overall, reducing wait times and increasing appointment availability can lead to better patient outcomes and client satisfaction, which can enhance the reputation of the veterinary clinic, driving long-term positive outcomes.

“Clients are quicker to ask questions to someone who is not a veterinarian.”
LMU Board Interviewee

Discussion

Post-pandemic veterinarians are feeling strained by increased demand from both new and existing clients. The rise of urgent care facilities is, in part, due to this increasing demand that is not being met by traditional general practices.¹⁹ However, the downside of urgent care facilities is that clients are not being serviced by their regular veterinarians.

Similar to use of MLPs in human health care systems, VPAs could see urgent care cases in veterinary hospitals. The model developed in this project assumes that licensing regulations still require veterinarians to perform an "in-person" exam to establish a veterinary-client-patient relationship (VCPR). This is an important detail, as the VPA conducting preventative care, rechecks, and simple urgent care for established clients allows veterinarians in the practice to see more new clients, thus fulfilling the in-person VCPR requirement and increasing the total number of new patients. To the extent that existing regulations allow the VPA to provide clinical services for established clients under appropriate supervision, veterinarians in the practice are free to spend more time with new clients, complex cases, and surgery, thus making the practice more productive and helping to meet the increasing demand. If veterinarian time cannot be reallocated to those activities (either because of regulatory restrictions or personal preference), then the current modeling of the VPA's expected financial impact would not be valid.

Every veterinary practice will have a unique perspective on how they might utilize the skills of a VPA. Before assuming that the VPA will generate a predetermined level of productivity or profitability, each practice needs to determine how its parameters may differ from the prototype modeled in this study. Important assumptions to consider that were built into the model are those presented in Tables 1 and 2. The ACT figures are typical financial metrics at the time of this analysis, but are not likely to be the same everywhere. In addition, the percentage of veterinarian time servicing each type of appointment may vary in any given hospital.

Overall, the general practice model was quite robust and stable under different assumptions. Factors highlighted in the sensitivity analysis are the cost of hiring the VPA (salary and benefits), non-DVM staff expenses, the ACT, and the proportion of appointments filled. Results were not particularly sensitive to VPA or non-DVM staff compensation, but fee structures and the proportion of filled appointments were determined to be more impactful. Several of this project's interviews questioned if services provided by the VPA should/would be priced lower than those same services administered by a veterinarian. Sensitivity analysis suggests that a lower ACT (via lower fees), would result in disproportionately lower profitability. However, the improved profitability with the addition of the VPA was still substantial.

Scenario analysis determined that productivity increases are quite sensitive to how much veterinarian time is allocated to VPA supervision. If more veterinarian time is spent supervising the VPA instead of on higher revenue-generating activities, the practice will not achieve the projected prototype financial results. Together, the results of sensitivity and scenario analyses indicate a substantial positive impact of the VPA across a range of key assumptions.

Several interviewees discussed various hospital situations where the primary role of the VPA would be responsibilities whose financial impacts are less directly predictable. These included roles and responsibilities such as improved client/staff communication and management, enhanced care coordination and case management, and general team

"We work with many rescue groups and could use the VPA to manage these relationships."
General practice owner

leadership. Although difficult to quantify at this stage, these owners and managers believed that increased productivity would come from a smoother workflow, an enhanced hospital culture, and improved client satisfaction. The magnitudes of these potential impacts relative to those projected in the current study can not be estimated with precision.

Although not modeled as a part of this project, the relative impacts of adding a VPA to a not-for-profit general practice would be expected to be similar to those found here because these practices have similar organizational structures and workflows. Key differences in price and cost structures would be expected, so the current project's financial results should be interpreted accordingly. However, the projected increase in caseloads and associated improved access to care suggest that the VPA could yield pronounced benefits for this market segment, where financial performance is generally not the primary objective.

As a final note on the general practice, improved workflow, care coordination, communication, and case management would almost certainly improve the quality of the work environment for the entire healthcare team (veterinarian included). 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 profitability.

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 most significant 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 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 offers 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 arises 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 the 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.

References

1. Lloyd, J.W. Pet healthcare in the U.S.: another look at the veterinarian workforce. Mars Veterinary Health, Vancouver, WA, August 2023, 14 pp.
2. Lloyd, J.W. Pet healthcare in the U.S.: Are there enough veterinary nurses/technicians? Is there adequate training capacity? Mars Veterinary Health, Vancouver, WA, August 2021, 7 pp.
3. Lloyd, J.W. Pet healthcare in the U.S.: Are there enough veterinary specialists? Is there adequate training capacity? Mars Veterinary Health, Vancouver, WA, February 2022, 7 pp.
4. Willis NG, Monroe FA, Potworowski JA, Halbert G, Evans BR, Smith JE, Andrews KJ, Spring L, Bradbrook A. Envisioning the future of veterinary medical education: the Association of American Veterinary Medical Colleges Foresight Project, final report. *J Vet Med Educ* 34: 1–41, 2007.
5. Kogan, LR and SM Stewart. Veterinary Professional Associates: Does the Profession's Foresight Include a Mid-Tier Professional Similar to Physician Assistants? *Journal of Veterinary Medical Education*, Vol 36, Issue 2, 220-225 June 2009.
6. Michigan State University College of Veterinary Medicine. Creating the Future of Veterinary Technology: A National Dialogue, Nov 13–15, 2011, East Lansing, MI, 20 pp.
7. Chadderdon, L.M., J.W. Lloyd, and H.E. Pazak. New directions for veterinary technology, *Journ Vet Med Ed*, 41(1):96-101, 2014.
8. Fults, M.K., K. Yagi, J. Kramer, and M. Maras. Development of advanced veterinary nursing degrees: rising interest levels for careers as advanced practice registered veterinary nurses, *Journ Vet Med Ed*, <https://doi.org/10.3138/jvme.2019-0041>.
9. Yagi, K., and M. Fults. NAVTA Corner: Perspectives on the creation of advanced veterinary nurse degrees, *Today's Veterinary Nurse*, winter 2021, p 8-9.
10. Lloyd, J.W., and M.L. Cushing. Masters in veterinary clinical care: exploratory project report. Veterinary Innovation Council, Orlando, February 2021, 25 pp.
11. Master of Veterinary Clinical Care, College of Veterinary Medicine, Lincoln Memorial University. <https://www.lmunet.edu/college-of-veterinary-medicine/graduate-programs/master-of-veterinary-clinical-care> (accessed 11.29.23).
12. Medical Economics. (2014, April 8). Use objective measures to incentivize midlevel providers for increased productivity. Retrieved December 6, 2023, from <https://www.medicaleconomics.com/view/use-objective-measures-incentivize-midlevel-providers-increased-productivity>
13. Medical Group Management Association. (2014, May 28). Non-physician providers: An unexpected route to revenue increases. Retrieved December 6, 2023, from <https://www.healthcarefinancenews.com/news/non-physician-providers-unexpected-route-revenue-increases>
14. Brown, D. F. M., Sullivan, A. F., Espinola, J. A., & Camargo Jr, C. A. (2012). Continued rise in the use of mid-level providers in U.S. U.S. emergency departments, 1993–2009. *International Journal of Emergency Medicine*, 5(1), 21. <https://doi.org/10.1186/1865-1380-5-21>

15. Elements of Successfully Integrating a Mid-Level Provider Into Practice. (2005). *Journal of Oncology Practice*, 1(3), 93–94. <https://doi.org/10.1200/jop.2005.1.3.93>
16. Dobson, G., Pinker, E., & Van Horn, R. L. (2009). Division of Labor in Medical Office Practices. *Manufacturing & Service Operations Management*, 11(3), 525–537. <https://doi.org/10.1287/msom.1080.0236>
17. White, D. L., Torabi, E., & Froehle, C. M. (2017). Ice-Breaker vs. Standalone: Comparing Alternative Workflow Modes of Mid-level Care Providers. *Production and Operations Management*, 26(11), 2089–2106. <https://doi.org/10.1111/poms.12743>
18. Partial Budgeting for Agricultural Businesses, Penn State Extension. <https://extension.psu.edu/partial-budgeting-for-agricultural-businesses> (accessed 11.30.23)
19. Raphael, M. Four key trends for animal hospitals in 2021, <https://indevets.com/blog/four-key-trends-for-animal-hospitals-in-2021/> (accessed 3/20/2024).

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)*