



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

# Telehealth and Nutrition Support During the COVID-19 Pandemic



**W**ITH HOSPITALS AND medical institutions across the world scrambling to find safe care for their patients during the ongoing coronavirus disease 2019 (COVID-19) pandemic, telehealth is rising to the forefront of medicine. Although the COVID-19 pandemic has highlighted the benefits of seeing patients virtually, telehealth has been used for decades to increase access to care.<sup>1</sup> For example, the Ontario Telemedicine Network began in the late 1990s<sup>2</sup> and has expanded over the years to provide care to more than 350,000 patients between 2018 and 2019 alone.<sup>3</sup> In the United States, Kaiser Permanente Northern California began the widespread use of video visits in 2013,<sup>4</sup> and has sustained telehealth capabilities until the present time. Despite this, the uptake of telehealth has been slow, but has seen a recent rise during the current COVID-19 health crisis.<sup>5</sup>

Increased use of telehealth during times of crisis is not new; in fact, the US government held several seminars and conferences discussing telehealth as a disaster-relief tool over the past 20 years.<sup>6</sup> More recently, in 2017, telehealth was used to provide pediatric care to Florida residents in response to Hurricane Irma.<sup>7</sup> It was successfully employed in hurricane shelters, with patients reporting that telehealth prevented them from unnecessary emergency department visits.<sup>8</sup> In regard to COVID-19, a recent article in the *New England Journal of Medicine* described innovative ways that telehealth is being employed during these unpredictable times, including remote triaging, transitioning regularly scheduled clinic visits to telehealth visits, and electronic intensive care unit monitoring.<sup>9</sup> Although the article focused on clinical visits, there are other important uses for telehealth that the COVID-19 pandemic has highlighted. There is robust literature supporting the efficacy of telehealth-based interventions for promoting diet changes<sup>10</sup> and body mass index reductions<sup>11</sup>; however, little is known about how to best use telehealth to provide nutritional support during the COVID-19 pandemic. In this article, we outline the urgency of telehealth, its current use by registered dietitian nutritionists (RDNs) during the COVID-19 pandemic, barriers to implementation, and future implications.

## WHY USE TELEHEALTH?

On March 16, 2020, the White House, in conjunction with the Centers for Disease Control and Prevention, announced new guidelines for social distancing.<sup>12</sup> Social distancing, or the act of physically distancing from other people and limiting group gatherings,<sup>13</sup> is an effective way to prevent the spread of infectious agents, including coronavirus.<sup>14</sup> In health care settings, social distancing has had huge implications on the ability to provide care.

Although social distancing might halt the spread of the virus, some health care providers are worried that it might lead to poorer health outcomes for patients without COVID-19.<sup>15,16</sup> Nonemergency surgery and procedures were halted, many in-person visits were cancelled and delayed, and providers were left in limbo regarding balancing societal needs and the needs of individual patients.

For RDNs, necessary encounters, such as education on a four-food elimination diet for a child with newly diagnosed eosinophilic esophagitis, weight management visits for obesity or malnutrition, and visits for those with enteral or parenteral nutrition, were questioned. Telehealth visits offer not only the ability to keep patients and health care providers safe, but also allow for the continued care of patients. In some cases, telehealth can even provide the ability to improve health care delivery beyond the standard of care.

## CURRENT USES OF TELEHEALTH

### One-on-One Visits

Perhaps one of the most intuitive first steps in using telehealth is to transform existing outpatient one-on-one visits to telehealth visits with an RDN. Telehealth visits have been used in multiple diseases to provide nutrition-related interventions.<sup>17-19</sup> Through this type of visit, RDNs can both obtain a thorough history and visualize a patient's home environment. For example, an RDN providing gluten-free diet education might note that gluten-free flours are directly adjacent to wheat flours. In children specifically, observing mealtime and parent-child interactions in the home environment has provided insight about how to best counsel families.<sup>20</sup> For patients with parenteral nutrition, direct observation of home supplies and equipment setup has the potential to prevent readmissions and central line-associated

This article was written by **Pooja Mehta, MD, MSCS**, assistant professor, **Marisa G. Stahl, MD, MSCS**, assistant professor, **Mary Shull, MD**, assistant professor, **Edwin Liu, MD**, professor and Taplin Endowed Chair for Celiac Disease, Digestive Health Institute, Children's Hospital Colorado, Aurora, and Department of Pediatrics, University of Colorado School of Medicine, Aurora; **Monique M. Germone, PhD**, assistant professor, Pediatric Mental Health Institute, Children's Hospital Colorado, Aurora, and Department of Psychiatry, University of Colorado School of Medicine, Aurora; **Sadie Nagle, MS, RD**, clinical dietitian II, Digestive Health Institute, Children's Hospital Colorado, Aurora; **Rebecca Guigli, MPH**, project manager, Data Science to Patient Value (D2V), Aurora, CO; and **Jacob Thomas, MS**, data analyst, Adult and Child Consortium for Health Outcomes Research and Delivery Science (ACCORDS), University of Colorado, Aurora.

<https://doi.org/10.1016/j.jand.2020.07.013>

bloodstream infections.<sup>21</sup> Although anthropometry cannot be independently measured using direct contact, several interventions have been tested and can be used as limited surrogates. For example, there is some evidence, but no strong agreement, that self-reported weight and height are accurate.<sup>22-24</sup> For those without a scale, waist circumferences can be used,<sup>25</sup> and are even more accurate when paired with video instructions.<sup>26</sup>

## Group Visits

Telehealth allows for easier coordination of group visits, while still allowing for social distancing. A group visit can consist of multiple guardians of the same patient, a multidisciplinary visit with several health care providers caring for the same patient, or several patients and one health care provider. This is especially useful for pediatric patients who might spend time in two different households. By using telehealth, guardians who split custody, grandparents, or even home health nurses can join the visit without physically being in the same location. This helps ensure that all people engaged in the care of the patient hear the same message and stimulates conversations and questions among the group.

Similarly, telehealth has also been used to facilitate the ongoing use of multidisciplinary clinics. Multidisciplinary clinics consisting of providers in multiple specialties have been shown to improve outcomes.<sup>27,28</sup> Although these clinics are often crowded with people and might not allow for following social distancing guidelines, telehealth allows for continued multidisciplinary care. For example, in our institution, patients from across the country are referred to the Gastrointestinal Eosinophilic Diseases Program. A visit to a multidisciplinary clinic within this program frequently involves consultation with a team of providers, including a gastroenterologist, allergist, RDN, feeding therapist, and psychologist. A typical telehealth visit consists of a nurse screening the patient's medical concerns and a medical assistant recording weight and height, as well as ensuring the technology is working correctly. Then, each provider sees the patient sequentially and ends by sending a secure message via the electronic health record to all of the other providers,

including concerns and suggested plans. The next scheduled provider then sees the patient, formulates a plan, and reports it in the same manner. Frequently, the RDN and feeding therapist see the patient together as a joint visit within this process. This process continues until the patient and family have seen the entire team. The patient then leaves the "virtual room" by disconnecting from the telehealth video app, and all the providers reconvene in the same virtual room to discuss their visits and determine global recommendations for the patient.

Finally, telehealth allows for continued group education. In our own institution, we began offering group gluten-free diet educational sessions for newly diagnosed patients with celiac disease via telehealth in January 2019. This was initiated in response to the fact that many of our patients live in rural areas that require significant travel for specialized pediatric care, and do not have access to RDNs with training on the management of a strict gluten-free diet. After doing so, we measured the effects of the type of education (in-person vs telehealth) on patient gluten-free diet knowledge, health-related quality of life, and diet adherence at their first follow-up visit post diagnosis of celiac disease. During the course of approximately 9 months, 57 families took the in-person classes and 13 took the telehealth-based classes. Not only did we find no differences in self-reported improvements in gluten-free diet management, but for some families the telehealth classes had a marked reduction in hours taken off work and need for childcare. Of the 39 children who returned for follow-up, there were no differences in RDN adherence assessments, scores on a gluten-free diet quiz, or health-related quality of life. Furthermore, no child in either group had a positive urine gluten immunogenic peptide result. Armed with this knowledge and with the spread of COVID-19, we continued to offer individual in-person and individual telehealth educational sessions, but transitioned all group educational sessions to group telehealth classes as of March 25, 2020.

## Inpatient Visits

In order to preserve personal protective equipment and in an effort to

avoid unnecessary patient contact, many inpatient consultations have been converted to telehealth encounters during the COVID-19 pandemic. These can occur through a hospital-provided telehealth cart equipped with a telehealth application, or through the patient's personal device, such as a smartphone or tablet. Some telehealth platforms are designed specifically for inpatient visits, but with the loosening of Health Insurance Portability and Accountability Act guidelines during the COVID-19 pandemic,<sup>29</sup> even other modalities such as FaceTime, Skype, or Zoom can be utilized.

## BARRIERS TO TELEHEALTH IMPLEMENTATION

Access to technology, such as available high-speed broadband service or wireless networks, is critical to successful telehealth implementation. It is not surprising that slow internet connection and poor connection to wireless networks negatively impacts communication between health care providers and patients during telehealth visits.<sup>30</sup> Although three-quarters of US adults have broadband internet service at home, this service is not evenly distributed among racial minorities, older adults, rural residents, and those with lower levels of education and income less likely to have broadband service at home.<sup>31</sup> The COVID-19 pandemic has highlighted this digital divide<sup>32</sup> and although the Federal Communications Commission has made some recent efforts at closing this gap, such as creating an interactive broadband map (<https://broadbandmap.fcc.gov/#/>) and increased financial support for the Rural Digital Opportunity Fund,<sup>33</sup> lack of access to the technology needed for telehealth remains an ongoing barrier.

Other frequently cited barriers to telehealth use include health provider and patient acceptance, reimbursement, and regulatory barriers.<sup>1,20</sup> A recent article in the *Journal of the Academy of Nutrition and Dietetics* provides guidance on how to address many of these barriers and practice telehealth specifically as an RDN.<sup>34</sup> However, during the COVID-19 pandemic, it has become easier to practice telehealth now more than ever. Prior training and use of familiar

technology lead to better acceptance<sup>30</sup> by both patients and providers, and many institutions perform a “tech-check” before scheduled appointment times. With social distancing in place, many providers have quickly adapted to telehealth and are finding that it is easier than they initially perceived.<sup>35</sup> Under our current extraordinary circumstances, the federal government is also making telehealth even easier by allowing covered health care providers subject to Health Insurance Portability and Accountability Act rules to communicate with patients in ways that might not fully comply with the requirements of Health Insurance Portability and Accountability Act, such as by using Apple FaceTime, Google Hangouts, and Zoom applications, among others.<sup>29</sup> In addition, the government has lifted many restrictions limiting telehealth use, now allowing for some doctors to practice across state lines.<sup>36</sup> To promote the logistical ability to see patients via telehealth both during the COVID-19 pandemic and afterwards, many organizations have recognized the importance of interstate compacts.<sup>37-39</sup> The purpose of these compacts vary but all have the goal of safely reducing regulatory barriers to allow practitioners to practice in multiple states. With current licensing for RDNs varying by state, perhaps it is time for RDNs to join the campaign.

Finally, there have been several reimbursement-related changes in the past few months. In response to the COVID-19 pandemic, Medicare beneficiaries were expanded, ensuring that essentially all electronic communications could be paid at the same rate as an in-person visit.<sup>40</sup> Whether this will persist after the pandemic subsides and what is covered by private insurers is less clear and is rapidly evolving. To help hospitals and administrators navigate this, several resources exist. The Center for Connected Health Policy has information regarding insurance coverage and easy-to-read fact-sheets summarizing new health policies during the COVID-19 pandemic.<sup>41</sup> Although no RDN-specific guidelines about initiating telehealth during the current regulations of COVID-19 have been released, several other implementation guidelines are available and applicable.<sup>42-44</sup>

## FUTURE IMPLICATIONS

As the COVID-19 pandemic continues to progress and change, it is unclear what the future holds. Even with the lifting of some restrictions in selected states, scientists believe that some degree of social distancing may be needed until 2022.<sup>45</sup> COVID-19 is just one of many new viruses and with increasing numbers of outbreaks happening in the past few decades<sup>46</sup> telehealth may be here to stay. Perhaps the most immediate action needed by RDNs and the medical community at large is to appeal to the government regarding the necessity of nutritional support in caring for patients. So far, government legislation in response to COVID-19 does not include RDNs. Because of the need to consider all aspects of patient care, some societies, such as the American Physical Therapy Association, have created a template letter to send to state legislatures advocating for policy changes in regard to licensure and reimbursement.<sup>47</sup>

In times of natural disasters, successful responses and preparedness have been associated with ensuring that structures such as people, equipment, systems, administrators, and legal organizations are already in place to respond effectively.<sup>48</sup> The ability of hospitals to convert in-person visits to telehealth visits is variable, with 89.5% of hospitals reporting telehealth capabilities in Minnesota, but only 36.9% in Louisiana. Moreover, the number of hospitals providing telehealth has not kept up with demands.<sup>49</sup> In our institution, we were able to quickly adapt to telehealth gluten-free diet classes because the framework for this class was already in place. Because of this, we suggest that institutions continue to offer some form of telehealth even after the effects of this pandemic have subsided. In addition, future research is needed on how to best combine telehealth and in-person visits in order to best meet the needs of patients and improve health-related outcomes.

## References

1. Dorsey ER, Topol EJ. State of telehealth. *N Engl J Med*. 2016;375(2):154-161.
2. Brown EM. The Ontario Telemedicine Network: A case report. *Telemed J E Health*. 2013;19(5):373-376.

3. Connecting People and Care Annual Report 2018-2019. The Ontario Telemedicine Network. Accessed July 17, 2020. <https://otn.ca/wp-content/uploads/2020/01/OTNAnnualReport-1819-final.pdf>.
4. Pearl R. Kaiser Permanente Northern California: Current experiences with internet, mobile, and video technologies. *Health Aff (Millwood)*. 2014;33(2):251-257.
5. Contreras CM, Metzger GA, Beane JD, Dedhia PH, Ejaz A, Pawlik TM. Telemedicine: Patient-provider clinical engagement during the COVID-19 pandemic and beyond. *J Gastrointest Surg*. 2020;24(7):1692-1697.
6. Doarn CR, Merrell RC. Telemedicine and e-health in disaster response. *Telemed J E Health*. 2014;20(7):605-606.
7. Murren-Boezem J, Solo-Josephson P, Zettler-Greeley CM. A Pediatric telemedicine response to a natural disaster. *Telemed J E Health*. 2020;26(6):720-724.
8. Grover JM, Smith B, Williams JG, Patel MD, Cabanas JG, Brice JH. Novel use of telemedicine by hurricane evacuation shelters. *Prehosp Emerg Care*. 2020 Mar 3:1-9.
9. Hollander JE, Carr BG. Virtually perfect? Telemedicine for Covid-19. *N Engl J Med*. 2020;382(18):1679-1681.
10. Kelly JT, Reidlinger DP, Hoffmann TC, Campbell KL. Telehealth methods to deliver dietary interventions in adults with chronic disease: A systematic review and meta-analysis. *Am J Clin Nutr*. 2016;104(6):1693-1702.
11. Huang JW, Lin YY, Wu NY. The effectiveness of telemedicine on body mass index: A systematic review and meta-analysis. *J Telemed Telecare*. 2019;25(7):389-401.
12. The President's coronavirus guidelines for america. Published 2020. Accessed April 24, 2020. [https://www.whitehouse.gov/wp-content/uploads/2020/03/03.16.20\\_coronavirus-guidance\\_8.5x11\\_315PM.pdf](https://www.whitehouse.gov/wp-content/uploads/2020/03/03.16.20_coronavirus-guidance_8.5x11_315PM.pdf).
13. Social distancing, quarantine, and isolation: Keep your distance to slow the spread. Centers for Disease Control and Prevention. Published 2020. Accessed April 24, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html>.
14. Nussbaumer-Streit B, Mayr V, Dobrescu AI, et al. Quarantine alone or in combination with other public health measures to control COVID-19: A rapid review. *Cochrane Database Syst Rev*. 2020;4:CD013574.
15. Rosenbaum L. The untold toll—The pandemic's effects on patients without Covid-19. *N Engl J Med*. 2020;382(24):2368-2371.
16. Douglas M, Katikireddi SV, Taulbut M, McKee M, McCartney G. Mitigating the wider health effects of covid-19 pandemic response. *BMJ*. 2020;369:m1557.
17. Vadheim LM, Patch K, Brokaw SM, et al. Telehealth delivery of the diabetes prevention program to rural communities. *Transl Behav Med*. 2017;7(2):286-291.
18. Kelly JT, Conley M, Hoffmann T, et al. A coaching program to improve dietary intake of patients with CKD: ENTICE-CKD. *Clin J Am Soc Nephrol*. 2020;15(3):330-340.
19. Guo X, Gu X, Jiang J, et al. A hospital-community-family-based telehealth program for patients with chronic heart

- failure: Single-arm, prospective feasibility study. *JMIR Mhealth Uhealth*. 2019;7(12):e13229.
20. Knotowicz H, Haas A, Coe S, Furuta GT, Mehta P. Opportunities for innovation and improved care using telehealth for nutritional interventions. *Gastroenterology*. 2019;157(3):594-597.
  21. Raphael BP, Schumann C, Garrity-Gentile S, et al. Virtual telemedicine visits in pediatric home parenteral nutrition patients: A quality improvement initiative. *Telemed J E Health*. 2019;25(1):60-65.
  22. Stommel M, Osier N. Temporal changes in bias of body mass index scores based on self-reported height and weight. *Int J Obes (Lond)*. 2013;37(3):461-467.
  23. Pursey K, Burrows TL, Stanwell P, Collins CE. How accurate is web-based self-reported height, weight, and body mass index in young adults? *J Med Internet Res*. 2014;16(1):e4.
  24. Harvey-Berino J, Krukowski RA, Buzzell P, Ogden D, Skelly J, West DS. The accuracy of weight reported in a web-based obesity treatment program. *Telemed J E Health*. 2011;17(9):696-699.
  25. Spencer EA, Roddam AW, Key TJ. Accuracy of self-reported waist and hip measurements in 4492 EPIC-Oxford participants. *Public Health Nutr*. 2004;7(6):723-727.
  26. McEneaney DF, Lennie SC. Video instructions improve accuracy of self-measures of waist circumference compared with written instructions. *Public Health Nutr*. 2011;14(7):1192-1199.
  27. Kozak VN, Khorana AA, Amarnath S, Glass KE, Kalady MF. Multidisciplinary clinics for colorectal cancer care reduces treatment time. *Clin Colorectal Cancer*. 2017;16(4):366-371.
  28. Erskine KE, Griffith E, Degroat N, et al. An interdisciplinary approach to personalized medicine: Case studies from a cardiogenetics clinic. *Per Med*. 2013;10(1):73-80.
  29. Notification of enforcement discretion for telehealth remote communications during the COVID-19 nationwide public health emergency. US Department of Health & Human Services. Accessed April 24, 2020, <https://www.hhs.gov/hipaa/for-professionals/special-topics/emergency-preparedness/notification-enforcement-discretion-telehealth/index.html>.
  30. Almathami HKY, Win KT, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: Systematic literature review. *J Med Internet Res*. 2020;22(2):e16407.
  31. Internet/broadband fact sheet. Pew Research Center. Published June 12, 2019. Accessed July 17, 2020, <https://www.pewresearch.org/internet/fact-sheet/internet-broadband/>.
  32. Ramsetty A, Adams C. Impact of the digital divide in the age of COVID-19. *J Am Med Inform Assoc*. 2020;27(7):1147-1148.
  33. FCC launches \$20 billion Rural Digital Opportunity Fund. Federal Communications Commission. Published February 7,



2020. Accessed July 1, 2020, <https://www.fcc.gov/document/fcc-launches-20-billion-rural-digital-opportunity-fund-0>.
34. Peregrin T. Telehealth is transforming health care: What you need to know to practice telenutrition. *J Acad Nutr Diet*. 2019;119(11):1916-1920.
  35. Saksena R. Doctors discover telehealth's silver lining in the Covid-19 crisis. STAT. Published 2020. Accessed April 23, 2020, <https://www.statnews.com/2020/04/19/telehealth-silver-lining-discovered-covid-19-crisis/>.
  36. Remarks by President Trump, Vice President Pence, and Members of the Coronavirus Task Force in Press Briefing, Whitehouse.gov. Accessed April 22, 2020, <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-vice-president-pence-members-coronavirus-task-force-press-briefing-5/>.
  37. Interstate medical licensure compact. Accessed April 23, 2020, <https://www.imlcc.org>.
  38. Physical therapy licensure compact. The Federation of State Boards of Physical Therapy. Accessed April 21, 2020, <https://www.fsbpt.org/Free-Resources/Physical-Therapy-Licensure-Compact>.
  39. Interstate professional licensing compact. American Occupational Therapy Association. Accessed April 21, 2020, <https://www.aota.org/Advocacy-Policy/State-Policy/Licensure/Interstate-Professional-Licensing-Compact.aspx>.
  40. President Trump expands telehealth benefits for medicare beneficiaries during COVID-19 outbreak. Centers for Medicare and Medicaid Services. Published 2020. Accessed April 22, 2020, <https://www.cms.gov/newsroom/press-releases/president-trump-expands-telehealth-benefits-medicare-beneficiaries-during-covid-19-outbreak>.
  41. Center for Connected Health Policy: The National Telehealth Policy Resource Center. Published 2020. Accessed April 23, 2020, <https://www.cchpca.org/resources/covid-19-telehealth-coverage-policies>.
  42. Berg EA, Picoraro JA, Miller SD, et al. COVID-19—A guide to rapid implementation of telehealth services: A playbook for the pediatric gastroenterologist. *J Pediatr Gastroenterol Nutr*. 2020;70(6):734-740.
  43. AMA quick guide to telemedicine in practice. American Medical Association. Published 2020. Accessed April 23, 2020, <https://www.ama-assn.org/practice-management/digital/ama-quick-guide-telemedicine-practice>.
  44. Telehealth care and after hours care. American Academy of Pediatrics. Accessed April 23, 2020, <https://www.aap.org/en-us/professional-resources/practice-transformation/managing-patients/telehealth-care/Pages/default.aspx>.
  45. Kissler SM, Tedijanto C, Goldstein E, Grad YH, Lipsitch M. Projecting the transmission dynamics of SARS-CoV-2 through the postpandemic period. *Science*. 2020;368(6493):860-868.
  46. Smith KF, Goldberg M, Rosenthal S, et al. Global rise in human infectious disease outbreaks. *J R Soc Interface*. 2014;11(101):20140950.
  47. Telehealth in physical therapy in light of COVID-19. American Physical Therapy Association. Published 2020. Accessed April 23, 2020, <http://www.apta.org/PTinMotion/News/2020/3/16/TelehealthCOVID19/>.
  48. Lurie N, Carr BG. the role of telehealth in the medical response to disasters. *JAMA Intern Med*. 2018;178(6):745-746.
  49. Hong YR, Lawrence J, Williams D Jr, Mainous A III. Population-level interest and telehealth capacity of US hospitals in response to COVID-19: Cross-sectional analysis of google search and national hospital survey data. *JMIR Public Health Surveill*. 2020;6(2):e18961.

## AUTHOR INFORMATION

Address correspondence to: Pooja Mehta, MD, MSCS, Digestive Health Institute, Children's Hospital Colorado, 13123 East 16th Ave, B290, Aurora, CO 80045. E-mail: [Pooja.Mehta@childrenscolorado.org](mailto:Pooja.Mehta@childrenscolorado.org)

## STATEMENT OF POTENTIAL CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

## FUNDING/SUPPORT

This project was supported by the Data Science to Patient Value (D2V) initiative funded by the University of Colorado School of Medicine Dean's Transformational Research Funding.

## AUTHOR CONTRIBUTIONS

P. Mehta draft the initial manuscript, all authors edited, reviewed, and approved the final manuscript. In reference to the telehealth celiac education work, P. Mehta, M. Shull, M.M. Germone, S. Nagle, and E. Liu designed the research and helped with analysis; R. Guigli and S. Nagle conducted the research; and J. Thomas analyzed the data.