

Vet Topics

IMPROVING THE QUALITY OF HEALTH CARE FOR YOUR BEST FRIENDS

Eye-catching research

By Taryn Riemer

A Western College of Veterinary Medicine (WCVM) scientist and her team's groundbreaking research earned international attention at the European College of Veterinary Ophthalmologists (ECVO) Congress in May 2018.

Dr. Marina Leis, a veterinary ophthalmologist and assistant professor at the WCVM, received best oral presentation for her discussion outlining her team's work — an investigation of the ocular surface microbiome (the bacterial community found on the eye's surface) of dogs.

"It was a really great experience," says Leis. "This was the second time I've presented at the ECVO, a meeting that brings together veterinary ophthalmologists and scientists from across the globe."

For Leis, the conference was a great place to not only present her team's work, but to make connections and hear about the latest advances in the veterinary ophthalmology field.

The WCVM researchers used a technique called high-throughput sequencing that gives them the ability to detect all bacteria on the surface of the dog's eye instead of just a few species.

"This has never been done before in dogs," says Leis. "It has long been accepted that dogs mostly have *Staphylococcus*, *Streptococcus* and *Bacillus* species of bacteria living on their eyes. But with this new technique, we have determined that these bacteria actually make up less than three per cent of what's on a dog's eye."

Leis explains this discovery is important



Veterinary ophthalmologist Dr. Marina Leis.

because if veterinarians know what bacteria are present on a healthy canine eye, they can recognize what's different in a dog with ocular disease and specifically target those bacteria species when prescribing medications. This could even have implications for how veterinarians can help prevent the development of antimicrobial-resistant bugs.

Now that Leis and her team have completed their pilot project and established a baseline

of information, they plan to focus on two specific ocular diseases in dogs: dry eye (keratoconjunctivitis sicca) and corneal ulcers. The Companion Animal Health Fund has given Leis and Dr. Matheus Costa, her co-principal investigator, an \$8,600 grant to complete this research study.

Results from Leis' work are expected to have an impact on both companion animals and, in the future, food-producing animals as well. 🐾

CAHF selects new research fellows

By WCVM Today

Drs. Priscela Almeida and Jiaying Ng, graduate students at the Western College of Veterinary Medicine (WCVM), have been selected as the Companion Animal Health Fund's (CAHF) new research fellows for 2018-19.

The two students, who are both conducting pet health research as part of their graduate programs, will receive CAHF funding in support of their graduate program and research efforts. Almeida will receive full funding from the CAHF for the year while Ng will receive a partial CAHF fellowship. Both students will be eligible to apply for a renewal of their fellowships after one year.

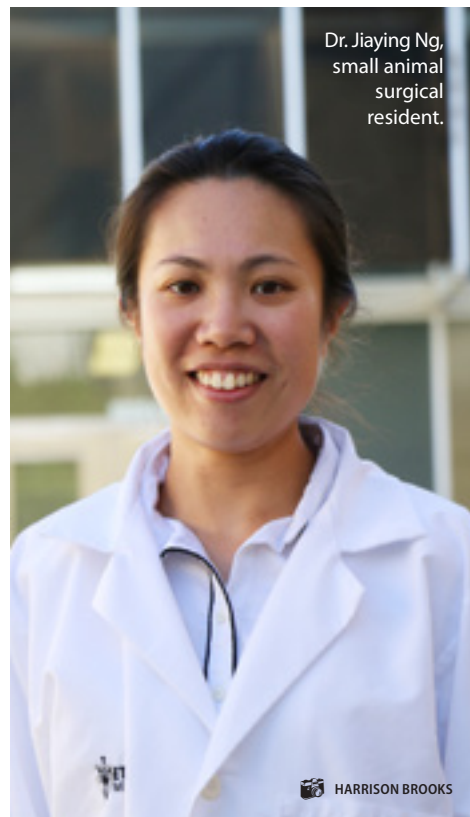
Almeida is a Master of Science student whose research work is supervised by Dr. Lynn Weber, a professor in the WCVM's Department of Veterinary Biomedical Sciences. Almeida is investigating the use of peas to create healthier diets for dogs and cats. These diets could help to reduce the number of pets that suffer from obesity and diabetes.

In 2006, Almeida received her veterinary degree from Federal University of Vicosa in Minas Gerais, Brazil. Before coming to the WCVM,

Almeida operated her own veterinary practice in Brazil for seven years. She and her young family moved to Canada in 2016 so she could complete her master's program. In addition to her graduate studies and research, Almeida works as one of Weber's teaching assistants in her physiology labs.

Ng is in the second year of a three-year combined master's and small animal surgery residency program with Dr. Kathleen Linn, professor in the WCVM's Department of Small Animal Clinical Sciences. Ng's research focuses on using radiographs to identify small volumes of free gas in a canine's abdomen.

After earning her Bachelor of Veterinary Science degree at the University of Melbourne in 2012, Ng practised at Singapore's Defu Veterinary Clinic and the Centre for Animal Referral and Emergency in Melbourne before coming to Saskatoon in 2015. She has published two research articles — one in the *Australian Veterinary Practitioner* and the other in the *Australian Veterinary Journal*. Ng received the Hill's Outstanding Resident Award in June. 🐾



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2018-19 PET PROJECTS

Seven WCVM teams have received more than \$84,800 from the college's Companion Animal Health Fund and other related funds in support of their research studies. Visit cahfpets.ca to learn more about these exciting projects.

Can a diet designed for humans with pancreatitis also help dogs with the same disease? Tammy Owens, Kevin Cosford, Aimee Crook, WCVM

Is glaucoma in dogs caused by cells that are drawn to injuries? Lynne Sandmeyer, Marina Leis, Bruce Grahn, Bianca Bauer, Leila Bedos Senon, WCVM

How can vets improve antimicrobial therapy for dogs with *E. coli*? Joseph Rubin, Michelle Sniatynsk, Rachel Courtice, WCVM

Can clipping fur before collecting joint fluid cause more contamination? Kathleen Linn, Justin Lavallee, WCVM

What's the correlation between chemotherapy and white blood cell function? Ryan Dickinson, Valerie MacDonald, Nicole Fernandez, Melissa Meachem, Cheryl Waldner, Arefeh Ravanbakhsh, WCVM

Can a new investigation lead to superior antibiotic use in canine eye infections? Marina Leis, Matheus Costa, WCVM; Gabriela Madruga UNESP, Brazil

Is it better to sedate or anesthetize dogs to assess vision loss? Danielle Zweste, Marina Leis, Bruce Grahn, Barbara Ambros, Jonathan Norton, WCVM



Dr. Candace Lowe collects a saliva sample from her dog Lola.

Raw meat study links dental and vet worlds

By Taryn Riemer

Second-year dentistry students Jessa Drury, Lisa Bachiu and Susanne Skulski were sitting in their endodontics class when they came up with the idea of how they could connect their schooling at the University of Saskatchewan's College of Dentistry with veterinary medicine.

"Our professor was showing us a video of a root canal he was doing on a ferret, and we had a light bulb go off," says Drury. "So, when we were in our dentistry table clinics class and needed to find a research project, we thought it would be cool to work with a veterinary dentist."

The three students — all pet lovers — decided to search on the Western College of Veterinary Medicine (WCVM) website to see if they could find someone who could help. Their search led to Dr. Candace Lowe, a board-certified veterinary dentist and an assistant professor at the WCVM.

For Lowe, it was the perfect opportunity to study a topic that she had wanted to investigate for some time: do dogs that eat raw meat diets have zoonotic bacteria in their mouths?

"We know from published studies that there are zoonotic bacteria that can be

passed on to humans in raw diets as well as in the feces of the dogs that eat raw diets. However, no one has investigated whether zoonotic bacteria are in their mouths," says Lowe.

Escherichia coli, *Salmonella* and *Campylobacter spp.* are the zoonotic bacteria species that cause the most concern. If these species are found in dogs' mouths, there's a potential for the bacteria to be transmitted to humans when the dogs lick their owners or even lick floors where young children crawl or play.

It's a concern that has also come up at work for Lowe and her coworkers: "We work in dog's mouths all day, and if a dog that has recently ate raw meat sneezes in my face, do I need to decontaminate? I don't know and I would really like to."

After spreading the word among Saskatoon's dog community, Lowe and the three dentistry students had over 60 dogs enrolled in the study: 30 dogs that ate raw meat diets and 30 dogs that ate kibble-based diets. Owners had to bring their dogs to the WCVM's Veterinary Medical

Centre within an hour of the animals' last meal so the research team could swab the dogs' mouths.

Skulski enjoyed the chance to come and work with dogs. "It was neat talking with the owners and hearing their perspective on feeding raw food diets because I personally didn't know people fed pets this kind of diet."

WCVM veterinary students also helped the dentistry team collect the dogs' saliva samples. "They were really helpful with actually doing the swabs ... because we walked in and didn't really know what to do. Do we ask it [the dog] to sit? Do we ask it to open wide?" says Drury, laughing.

In early May, the three dentistry students presented a research poster titled, "Identification of bacterial zoonotic pathogens in the oral environment of dogs fed a raw-food diet," at the 2018 Life and Health Sciences Research Expo on the U of S campus. They hope to eventually have their research published and will complete a final presentation later this fall.

Although a large portion of the study is complete, the group still hopes to find more participants. Contact Dr. Candace Lowe (candace.lowe@usask.ca) for more details. Since the team must collect dogs' saliva within an hour of eating, candidates must be near Saskatoon. 🐾

More health news at:

cahfpets.ca

NEW CT SCANNER CREATES MORE SLICES OF LIFE

By Lynne Gunville

Drs. Lesley Zwicker and Sally Sukut can't hide their enthusiasm for the Western College of Veterinary Medicine's new computed tomography (CT) scanner that's pushing the boundaries of veterinary medical imaging.

As the board-certified radiology specialists explain, the Toshiba Aquilion ONE can create 320 "slices" or cross-sectional images during each rotation around the patient.

"With the 320-slice CT there are 320 detector rows, so we can scan a larger volume of the patient in a single revolution," explains Zwicker, an assistant professor in the WCVM's Department of Small Animal Clinical Sciences.

"We're able to scan 16 centimetres of tissue in a half second, and that means we can acquire a whole region of the skull or brain or the heart, all in one rotation."

The new unit replaces the college's previous scanner that could produce 16 image slices per rotation. The Toshiba Aquilion ONE with its increased volume capabilities, advanced technology and improved software produces a clearer image with reduced artifacts — distortions or errors in the image that can make interpretation difficult.

The new CT scanner also allows members of the WCVM's medical imaging team to reduce motion artifacts in regions where it has notoriously been an issue, such as

the heart and lungs. The advanced software can produce images showing an organ's structure, movement and blood flow in real time.

Dynamic imaging will also provide research opportunities such as perfusion studies involving the heart or brain. While both Zwicker and Sukut plan to incorporate the CT unit into their prospective research projects, they also point out that the machine can play a large role in recruiting other specialists to the WCVM.

For example, veterinary cardiologists and neurologists would welcome the opportunity to use such a high-tech CT machine for their clinical patients as well as for their research.

"The machine also offers unique research opportunities for our graduate students," says Zwicker. "It makes sense for us to utilize this machine as much as we can to provide novel research opportunities for our residents and for the master's or PhD students who are affiliated with the WCVM or even the University of Saskatchewan."

WCVM veterinary students get a first-hand look at the advanced technology and learn more about its use as a tool for veterinary diagnostics and research

studies. In addition, the CT scanner contributes to the WCVM's goal of becoming a leader in cancer research and care.

"With our oncology patients, not only are we imaging the primary tumour but we're also imaging the other regions of the body including the thorax and abdomen in order to stage them and monitor the appropriateness of treatment and regression of the tumour," Sukut says. "The machine will allow us to acquire images a lot quicker when doing full body scans looking for metastases."

Both Zwicker and Sukut look forward to providing exceptional diagnostic services for their clients as they investigate advanced clinical applications such as cardiac imaging and brain perfusions — applications that have already made significant contributions to human medicine.

"I think because the scanner's dynamic capability is novel in veterinary medicine, it will impact the types of clinical services that we can offer as well as the research capabilities and collaborations," says Zwicker.

"As a referral academic institute, it's very important for the WCVM to stay on the cutting edge in the technology world with imaging. This new scanner allows us to be that sort of leader." 🐾



PUZZLING DISEASE DEVASTATES B.C. RABBITS

By Harrison Brooks

Veterinarians and rabbit owners in British Columbia are on alert for a devastating viral disease that has caused the death of hundreds of rabbits in the province this past spring.

A lethargic rabbit with no appetite might be showing clinical signs of rabbit hemorrhagic disease (RHD). Within 24 to 36 hours, infected animals suffer from painful, internal bleeding that causes these otherwise silent creatures to scream in agony.

This represents the shocking reality for rabbits that have been infected by RHD. It is a highly contagious calicivirus that specifically affects European rabbits. It can't be transferred to people or other animals, and it does not appear to affect other species of rabbits that are native to North America.

In addition to listlessness and a lack of appetite, rabbits affected with RHD can show signs such as a lack of co-ordination, behavioural changes or trouble breathing before dying. Infected rabbits are often bleeding from the nose at the time of death.

Caliciviruses may be found in rabbits, but most of them don't cause any serious disease, says Dr. Vikram Misra, a professor of virology at the Western College of Veterinary Medicine (WCVM). "However, what happens once in a while is that the virus mutates from a relatively harmless virus to something that is quite dangerous."

Originally found in China in 1984, RHD has killed thousands of rabbits in Europe, Australia, Mexico, United States and now Canada. In early March a unique strain of RHD affected rabbits in B.C. — eventually in multiple communities. RHD serotype 2 virus (RHDV2) appears most closely related to a strain that was found in Spain a few years ago.

"Dying rabbits were first reported to me from the Vancouver Island University campus," says Dr. Helen Schwantje, wildlife



veterinarian for the Government of B.C. and co-director of the B.C. node of the Canadian Wildlife Health Cooperative (CWHC). Staff there told me they had found a few dead rabbits and their students were concerned [the rabbits] are being poisoned."

The rabbits were sent to the provincial Animal Health Laboratory where diagnostic team members confirmed the virus infection. The strain was identified by staff at the federal infectious disease lab in Winnipeg, Man.

Dr. Jane Pritchard, B.C.'s chief veterinarian, assisted with the importation of over 1,000 doses of a European RHD vaccine to private practitioners on Vancouver Island and the Lower Mainland in mid-April. The injectable vaccine appears effective in preventing new cases, but with no way to treat infected rabbits, veterinarians can't stop the disease's spread in the feral and captive rabbit populations.

According to Misra, RHD is an incredibly hardy virus and can even withstand biosecurity measures such as disinfectant foot mats. "You need really alkaline conditions to inactivate it. Sodium hydroxide inactivates it, but a lot of disinfectants that are available have no effect on it," says Misra. "It can remain around in an environment — even in carcasses — for a very, very long time."

With the recent B.C. outbreak, the virus was first identified in feral rabbits on Vancouver Island in the Nanaimo area and



on the mainland (Annacis Island) near the city of Delta, B.C. Eventually, the disease was also detected in nearby Richmond. Around the same time, dead rabbits were also found in Courtenay and Comox on Vancouver Island. The proximity of outbreaks and the pattern in which they occurred have created a puzzle about just how the outbreaks occurred.

"There was actually a lot of concern from the public that the virus was released intentionally," says Schwantje. "But I assured them that it was not released by the government, and we have no idea of the source."

Schwantje says there is no way to protect feral rabbit populations from RHD, but the best way to protect pet rabbits is to have them vaccinated for the disease. 🐾

Little things in life make researcher's day

By Harrison Brooks

Microbiologist Moses Ikechukwu's enthusiasm for his research is infectious. His passion for learning was passed down to him from his parents who sacrificed a great deal for their son's education in Nigeria.

Ikechukwu always wanted to be a scientist, but it wasn't until he picked up a microbiology textbook in high school that his dream of becoming "a great research microbiologist" began. He was amazed to read about tiny organisms, too small to see, that have been responsible for millions of deaths.

That moment, which happened about 17 years ago, started Ikechukwu down the path that would one day take him over 10,000 kilometres from Nigeria to the University of Saskatchewan where he's a visiting researcher at the Western College of Veterinary Medicine (WCVM).

Ikechukwu has witnessed the problems with Nigeria's education system — a lack of infrastructure, classroom over-crowding and under-funding — as a student in southern Nigeria, and more recently, as a teacher in the country's north during his one year with the national youth service corps.

His father is a civil servant at Obafemi Awolowo University — the same school where Ikechukwu received his undergraduate and master's degrees — while his mother is a businesswoman. His parents' stable jobs allowed Ikechukwu to attend school in the ancient city of Ile-Ife in southwest Nigeria.

While Ikechukwu has never been in a position as dire as what he has witnessed throughout the different regions of Nigeria, he recalls his family skipping meals or eating once a day for extended periods so his parents could afford tuition.

After receiving his master's degree, Ikechukwu moved to southeast Nigeria



and began lecturing at Ebonyi State University. He's also working on his PhD program at Nnamdi Azikiwe University in Awka, Nigeria.

Urged by his supervisor to study the bacterium *Staphylococcus pseudintermedius*, Ikechukwu began looking for previous studies. None of his internet searches came back with any real results until he searched the entire world.

"The first thing that popped up was [the name] Joe Rubin, so when I started to look at what has been done on *S. pseudintermedius*, I saw that most of his work has been referenced by almost all of

"This is what I wanted — I wanted an environment where I can work. I believe that I'm going to learn a lot."

those [studies]," says Ikechukwu, whose interest was piqued. "Who is this? Who is this Joe?"

Ikechukwu sent an email to Rubin and two scientists connected. "What Moses has brought to [our] team is an amazing attitude, a really excited willingness to learn and just an enthusiasm for doing his experiments," says Rubin, an assistant professor in the WCVM's Department of Veterinary Microbiology.

Since March, Ikechukwu has been working closely with Rubin and studying *S. pseudintermedius*. It's commonly found on the skin or in the mouth, nose or intestinal tract of up to 90 per cent of healthy dogs and a smaller percentage

of healthy cats. It's described as an opportunistic pathogen because it can only cause infections in animals and people with compromised immune systems.

Of the 102 *S. pseudintermedius* isolates (samples) that Ikechukwu brought, tests have shown the Nigerian bacteria to be generally more resistant to antibiotic drugs than the same bacteria from Western Canada. What really excites Rubin about Ikechukwu's work is the chance to look at the human connection with *S. pseudintermedius* — an area that hasn't been exclusively studied yet. Among his samples, Ikechukwu came with 13 isolates taken from people and their dogs. Using DNA fingerprinting techniques, the researchers will determine whether those corresponding bacteria are matches. If they are, Rubin says that information would help his team understand how commonly dogs transfer *S. pseudintermedius* to people.

Meanwhile, Ikechukwu has access to electricity that never dies, Wi-Fi that's free and extremely fast, and equipment that he never dreamed of using in Nigeria.

"This is what I wanted — I wanted an environment where I can work. I believe that I'm going to learn a lot," says Ikechukwu, who returns to Nigeria in August. "And when I go back to my country, I'm not going to be the same, I'm going to be very, very different." 🐾

Visit wcvmtoday.usask.ca to read Moses' full profile. Journalism student Harrison Brooks of Fort Qu'Appelle, Sask., is the WCVM's summer research communications intern.

RESEARCH IN PRINT

A roundup of WCVM-related companion animal research articles that have been recently published in peer-reviewed journals.

Kerbel B, Badal K, Sundarrajan L, Blanco A, Unniappan S. "Xenin is a novel anorexigen in goldfish." *PLoS One*. May 2018. 13(5): e0197817. DOI: 10.1371/journal.pone.0197817

Belotta AF, Teixeira CR, Padovani CR, Rahal SC, Mayer MN, Mamprim MJ. "Sonographic evaluation of liver hemodynamic indices in overweight and obese dogs." *Journal of Veterinary Internal Medicine*. Jan. 2018. 32(1):181-187. DOI: 10.1111/jvim.14883

Seshia S, Gaunt MC, Kidney BA, Jackson ML. "The effect of three resuscitative fluid therapies on hemostasis as measured by rotational thromboelastometry in dogs." *Veterinary Clinical Pathology*. Mar. 2018. 47(1):38-44. DOI: 10.1111/vcp.12573

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of Veterinary Emergency Critical Care. May 2018. 28(3):244-251. DOI: 10.1111/vec.12720

Andrés-Lasheras S, Martin-Burriel I, Mainar-Jaime RC, Morales M, Kuijper E, Blanco JL, Chirino-Trejo M, Bolea R. "Preliminary studies on isolates of *Clostridium difficile* from dogs and exotic pets." *BMC Veterinary Research*. March 2018. 14(1):77. DOI: 10.1186/s12917-018-1402-7

Bouillon J, Snead E, Caswell J, Feng C, Hélie P, Lemetayer J. "Pyelonephritis in dogs: retrospective study of 47 histologically diagnosed cases (2005-2015)." *Journal of Veterinary Internal Medicine*. Jan. 2018. 32(1):249-259. DOI: 10.1111/jvim.14836

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Nutt LK, Wilson ML, Sakals S. "Comparison of surgical time and complication rate of subcutaneous and skin closure using barbed suture or traditional knotted suture in dogs." *Canadian Veterinary Journal*. Dec. 2017. 58(12):1281-1286. PMID: PMC5680738

Holly VL, Zwicker LA, Starrak G, Leis ML, Bauer BS, Osinchuk S, Sandmeyer LS, Grahn BH. "Odontogenic parakeratinized cyst resulting in exophthalmos and palatine, maxillary, and zygomatic bone erosion in a dog." *Veterinary Ophthalmology*. Dec. 2017. DOI: 10.1111/vop.12538

Bits & Bites

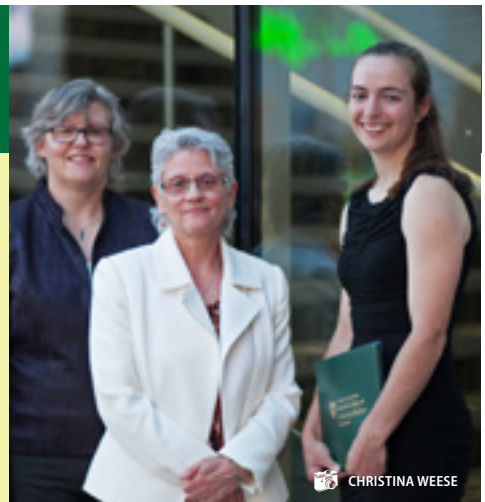
Chotowetz heads CVMA: Dr. Terri Chotowetz, a 1990 WCVM graduate, is the new president of the Canadian Veterinary Medical Association (CVMA) during its 70th year of existence. The announcement was made during the CVMA's annual convention, which took place from July 5 to 8 in Vancouver, B.C. After graduating from the WCVM, Chotowetz practised in Alberta from 1990 to 1998 in several mixed animal practices before returning to Saskatchewan in 1998. She has practised at Saskatoon's Cumberland Veterinary Clinic for the past 18 years.

WCVM alumnus small animal award: Dr. Matt Read of Calgary, Alta., received the 2018 CVMA Small Animal Practitioner Award in recognition of his passion and enthusiasm for improving the provision of anesthesia and pain management in veterinary medicine. A 1998 WCVM graduate, Read remained at the college to complete his veterinary anesthesiology residency and a Master of Veterinary Science degree in wildlife

anesthesia. Following his residency, the board-certified anesthesiologist taught at the University of Georgia for two years before returning to Canada and developing and supervising the anesthesia services in two referral practices in Toronto and Calgary. Read joined the University of Calgary's Faculty of Veterinary Medicine in 2010.

WCVM awards: Dr. Jessica Paravicini of Qualicum Beach, B.C., was the recipient of this year's WCVM Faculty Gold Medal — the highest honour for graduating veterinarians. Paravicini, who practises at a small animal clinic on Vancouver Island, may pursue a veterinary specialty in the future after spending a few years in general practice.

During the 2018 WCVM graduation awards evening on June 7, Dr. Alexina Labrecque of Saskatoon, Sask., and Dr. Greg Ruus of Calgary, Alta., were the first recipients of the Petplan Pet Insurance Award in Emergency and Critical Care, along with a prize of \$2,000 each. Their



L to R: Michele Del Rizzo, Helen Del Rizzo Brown and Dr. Larissa Goldsmith.

classmate, Dr. Larissa Goldsmith of Baldur, Man., was the inaugural recipient of another new award — the Dr. Garth Brown Award. The honour was created in memory of Brown, a 1989 WCVM graduate who passed away on Jan. 15, 2018. The new award recognizes a student "who places high importance on compassion for both pet and client" and has demonstrated their compassion through medical competency and analytical thinking.



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