

The InterNICHE Alternative

Andrew Knight Veterinary Student Murdoch University, Murdoch-School of Veterinary Medicine Australia

It looked simple enough, I thought. I hadn't seen anyone hold the needle holder and scissors in the same hand before, but it seemed skillful and compact, and it impressed this novice surgeon. So I decided to give it a go. But I hadn't reckoned on having eight people watching me, one of whom was Assistant Professor Lara Rasmussen, U.S. guru of progressive veterinary surgical training. I hadn't reckoned on having a CNN film crew following my every move. Somehow I seemed to be all thumbs. I think I made every mistake short of actually suturing my nose to my foot. Thankfully, however, the patient was somehow unharmed. In fact, the patient remained remarkably stable throughout. Hemorrhage was minimal and the prognosis couldn't have been better. Perhaps my mastery of the esoteric art of surgery wasn't so lacking after all, I hoped. Or perhaps it was due to the fact that the patient had silicone for blood. Actually the rest of the patient was artificial, too. For the patient was, in fact, a state-of-the-art "Alternavitae" surgical simulator - one of several on display in the alternatives room at the First InterNICHE conference New Teaching Approaches in the Life Sciences, held in Brussels in February 2001.

Other amazing exhibits on display in the alternatives room included a canine "Vascular Access Training Model" from the University of California, Davis, which, when charged with fake blood, allows realistic venipuncture training (the blood even stains realistically!); the "Face -Anatomy Revealed" computer simulation



Veterinary students Linnaea Stull and Andrew Knight practice their surgical skills on the small intestinal simulation model from Alternavitae.

from the Medical College of Ohio, which allows the user to progressively "melt" the layers away from a human face and to activate and witness the muscles in action, unimpeded by overlying skin; and Rescue Critters® mannequins such as "Fluffy." Fluffy is a feline CPR trainer with an artificial pulse and working lungs that allows the practice of mouth-to-snout resuscitation and cardiac compressions. The critical care model also comes with a trachea, oesophagus, epiglottis, veins and arteries, allowing endotracheal intubation and venipuncture training. Displaying these state-of-the-art alternatives is typical of the work done by the International Network of Individuals and Campaigns for Humane Education (InterNICHE). Born in 2000 from EuroNICHE, InterNICHE had contacts in over 30 countries by February 2001, including Australia. Its vision and eventual goal is the elimination of harmful animal usage in all levels of education throughout the world. However, as InterNICHE Coordinator Nick Jukes explained, InterNICHE is not opposed to all animal use in education, merely to harmful animal use, although most animal use in education is harmful. Examples of animal usage supported by InterNICHE include the use of animals for dissections who have died of natural causes or were euthanatized for medical reasons, and the use of veterinary patients in a clinical setting, where the focus is on healing rather than harming. Nonanimal alternatives promoted by InterNICHE include computer simulations, videos, high-quality models and non-invasive self-experimentation.

In some instances a combination of alternative methods might be required to *The*

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Tammy McNamara and her beloved dog Annie. Annie is one of the lucky ones. She was adopted after being used for experimentation and educational purposes.

Tammy McNamara is a second-year student at Oregon State University (ORS) College of Veterinary Medicine. She discusses the need for students to thoroughly investigate the use of animals in their education prior to any laboratories to prevent them from making split-second decisions about morally challenging situations. She and others in her class have prepared information on animal use at ORS so that other incoming students are not put in this position.

Veterinary Students

Preparation Prevents Split-Second Decisions

I entered veterinary school because I love animals. Like so many others, I had no idea that killing healthy animals was a part of the veterinary curriculum. My first encounter with live animals in veterinary school was in an animal-handling lab. An assortment of small animals, including mice, rats, guinea pigs, gerbils and hamsters, were brought in for us to handle. We handled and played with them but, after this enjoyable interaction, these animals were all killed following the lab. The justification that we were given for the animals being killed was that they were culled from research and would later be used for dissection.

At the time, I accepted the fact that these animals would be killed regardless of whether I handled them or not, so I resolved to learn from the experience. I was led to believe that the death of these animals was a necessary part of my education. However, seeing the empty cages sitting in the hallway brought with it a realization - I do not want to kill healthy animals. I saw my lifelong dream of becoming a veterinarian fading because I decided the cost of killing healthy animals was too high of a price to pay for my education. I have a very strong desire to become a veterinarian, but I will not compromise my integrity to become one. It was an understanding of the human-animal bond, and a compassion for the well-being of animals that originally interested me in veterinary medicine. I want to retain the sense of compassion that I compromised in the animal-handling lab.

By meeting other students with similar views and networking with veterinarians, I realized that it is not necessary to kill healthy animals to earn a degree in veterinary medicine or to become a competent veterinarian. This was a great relief to me and I am truly indebted to the amazing people who have helped me come to this realization. I am also very fortunate to have other students in my class who share my feelings and who are able to provide support and resources for each other. I also admire all those students who are standing up for their beliefs and making changes at their veterinary colleges.

The next live animal situation I encountered was with a dog used for a neurology class. Remembering the fate of our rodents, I was terrified this dog would be killed after the course was completed. A little golden mutt with big, scared brown eyes seeking a dark corner to hide in, she instantly broke my heart. When we brought her outside during a class break, she acted as if she had never walked on grass before, prancing around like it tickled her feet. She had little socialization and was clearly petrified by the mass of students all wanting to touch and pet her. I called her Annie.

As we later learned, Annie had been living in the Lab Animal Resource building for at least a month before we were told about her. Her kennel mates had all been taken away and killed for instructional purposes in a surgery class. She was spared for our neurology course because she was "the cutest." We received permission to take Annie out on weekends and walks at lunchtime. Slowly, Annie was learning how to be a socialized dog.

As time went on, I became very curious about this shy little dog. I found out that she was about 17 months old and was a "Class A" breeding colony reject. She had been born and bred for research purposes (a "Class A" animal has never been a pet and is only used for laboratory experiments). Through her interaction with the students, Annie was participating in a large-scale, real-life experiment - learning to trust, love, and be loved. But in her records, she was only identified by a six-letter code to match the big tattoo in her ear.

As the end of the term approached, I was fearful about Annie's fate. I did not want any harm to come to Annie, so I made

Making a Difference

arrangements for her to leave the college. While I was not allowed to adopt her, I was able to purchase her in an auction from the Property Surplus Department. After completing the necessary paperwork and paying for her, I was able to take Annie home. She is adjusting very well to her new life as a companion and is now a beloved member of my family. Annie is one of the lucky ones. Unfortunately, there are too many others like her that suffer a fatal ending.

I find it very frustrating that students are not provided with accurate information about the source and demise of animals used in their courses beforehand. We were not told anything about the small animals used for handling or about Annie until the day these animals entered our classroom. The source of our anatomy cadavers remained foggy until a concerned classmate looked into the source on her own. The cadavers came from another university so she had to call different people there to pinpoint where the animals were actually coming from. Finding ethically-acceptable

The InterNICHE Alternative - continued from page 1 achieve the best educational outcomes, such as in alternative veterinary surgical courses. where students learn basic manual skills such as suturing and instrument handling using simulated organs and other models, and then progress to simulated surgery on *ethically-sourced cadavers* (obtained from animals who have died naturally or in accidents or been euthanatized for medical reasons). Finally, they assist with and then perform supervised surgeries on real patients who actually benefit from the surgery, as distinct from on healthy animals who are later killed. A very popular component of alternative veterinary surgical programs worldwide is the neutering of homeless dogs and cats from animal shelters, which provides invaluable experience for the students, while at the same time assisting the shelters and the animals they're seeking to rehome.

The success of such methods can be personally attested to by this author, who, along with a classmate, jointly became Western Australia's first veterinary students to be granted alternatives to all of the terminal surgical laboratory classes at cadavers and alternatives to the harmful use of animals is time consuming, especially for a full-time veterinary student. But alternatives do exist! My experiences after my first year of veterinary school have taught me to investigate thoroughly if and how animals are to be used in our classes well before the class even starts. Being prepared relieves me from making splitsecond decisions about morally challenging situations.

Although my efforts to gather complete and accurate information on the source and use of animals for educational purposes are often met with resistance, I feel that this information is important and that the faculty should readily provide it. As a veterinary student who cares deeply about animals and whose tuition money is used by the school for educational purposes, I believe I have the right to know where these animals come from, how they are cared for, and what their fates will be. Therefore, my classmates and I have compiled information on how animals are used in the first-year courses at Oregon State University. To

Murdoch University in 2000. Instead of performing the traditional terminal surgeries, we gained external experience in private veterinary clinics and animal shelters, performed simulated surgeries on ethically-sourced cadavers, and performed supervised sterilizations at Murdoch on dogs and cats from an animal shelter. Jointly we did not participate as surgeon or assistant surgeon in a total of, at most, 13 scheduled surgeries at Murdoch. Instead, we performed or assisted with a total of at least 62 additional surgeries, including 21 dog and cat spays. It felt exceedingly good to be positively affecting the dog and cat overpopulation problem by neutering animals, and thereby preventing unnecessary deaths, instead of causing them during our surgical training. You can obtain a more detailed description of the outcomes of the first year of Murdoch's alternative surgical program from me or from the conference proceedings.

Other speakers from universities around the world made it clear that the changes occurring at Murdoch are part of an inevitable trend towards humane obtain this information we questioned faculty, made phone calls, and looked into sources using information gathered from other students. Unfortunately, the administration at ORS would not allow us to include this information in the freshman packet but I have been informed that the same type of information would be provided by the college. We are hopeful that ORS will follow through with their promise.

I have requested information for the upcoming years. So far I have had to rely on information from other students because I was unable to get this information directly from the college. Information concerning the source of animals is available from colleges via the Freedom of Information Act, but I have found this to be a timeconsuming and lengthy process. This has all been concerning because complete and accurate information should be provided to all students so that we can make our own informed decisions about the use of animals engaged for our education.

alternatives to harmful animal use. In North America, for example, by January 2001, 20 of the 31 veterinary colleges were offering alternatives to invasive experiments or other procedures, with 18 offering alternatives to terminal surgeries. Two of the 31 had eliminated terminal surgeries altogether, namely Tufts University and Prince Edward Island. The newest U.S. veterinary school, the Western University of Health Sciences in Southern California, will harm no animals throughout its curriculum and has a "reverence for life" philosophy.

Such colleges send a powerful message. They prove that there is no longer any need to kill to learn how to heal. The world of veterinary education is changing, and veterinary schools throughout the world can choose to either help shape the future or to be shaped by it.

For further information contact Andrew Knight (Australian InterNICHE contact) at akkkk4@yahoo.com.au. Visit http://www.rescuecritters.com to see the full range of Rescue Critters® mannequins.

ACCENT ON AN ALTERNATIVE Fracture Game 2000

Dr. Terry Braden, D.V.M., D.A.C.V.S. Professor of Orthopedic Surgery College of Veterinary Medicine Michigan State University

Fracture Game 2000 is a CD-ROM that is an interactive program used for general educational purposes. However, its main purpose is to be a ready reference for fracture management in small animals. This is the second edition, which has doubled its content and is much more user-friendly than the first edition.

A student, intern, resident, or practitioner who has a fracture presented to them can go to this program and follow down the algorithmic orthopedic tree until they find a similar fracture and a similar signalment. The program then becomes interactive. Using the interactive program, they can determine the best treatment for that specific fracture.

As most everyone knows, there are several different ways to fix every fracture, each of which may lead to bony union. This game has labeled the different choices the player will make as poor, fair, good, or best and a reason is given for each classification. Even a poor choice may lead to bony union 50% to 70% of the time. A fair choice will lead to bony union 60% to 80% of the time, and a good choice 70% to 90% of the time. The best choice will lead to bony union 90% to 95% of the time.

The philosophy that should be used by the veterinarian when practicing fracture management is to do the least invasive procedure biologically, and yet to biomechanically stabilize the fracture sufficiently enough that bony union is possible with a 95 percent confidence level. The veterinarian must also keep in mind that the overall goal is "Early Return to Full Function." This philosophy is used throughout



Fracture Game 2000.

Fracture Game 2000 has fractures of both the dog and cat involving the following bones:

I. Femur	9. Sacro-Iliac
2. Tibia	10. Pubis
3. Fibula	11. Ischium
4. Humerus	12. Scapula
5. Radius	13. Mandible
6. Ulna	14. Metatarsus
7. Acetabulum	15. Metacarpus

8. Ilium

The program consists of 189 fracture cases, 719 illustrations and photos, 1,302 radiographs, and 270 megabytes of knowledge. The majority of the cases presented have follow-up evaluation; therefore, the classification system of poor, fair, good, or best is validated and not just opinion.

In this game, for each case you will be able to practice your reduction skills by bringing each fragment, one at a time, from the preoperative radiograph into reduction until you have reconstructed the entire bone. This reduction step will force you to preplan the surgery. What fragment will be approached first? What fragment will be reduced first? Preplanning will eliminate a lot of practice surgery and a lot of mistakes.

Fracture Game 2000 has the following system requirements:

- 1. Pentium 133 MHz computer or better
- 2.16 MB of RAM
- 3. CD-ROM drive (8x or higher)
- 4. Monitor: 640x480 with 64K color
- 5. Microsoft Windows 95 or better

The game has the technical support of the Educational Technologies Team, Keller Technology Center, College of Veterinary Medicine. Call 517-353-5551 or e-mail edtech@cvm.msu.edu with questions or problems.

To order Fracture Game 2000 contact:

Instructional Media Center

Michigan State University

P.O. Box 710

East Lansing, Michigan 48826 Phone: 517-353-9229

Fax: 517-432-2650

or visit the WEB site at http://www.msuvmall.msu.edu/imc.

AVAR eGroup for Students continues to grow. This free, easy-touse e-mail group service is a discussion group for the benefit of veterinary medical students, veterinary technician students, and pre-veterinary students to address issues that pertain to their education, particularly the use of nonhuman animals. Other veterinary professionals are welcome to participate, as well.

Electronic Discussion Group Grows in Membership

"For me, the greatest thing about the AVAR eGroup for Students has been knowing that I am not alone in the struggle to obtain a humane education. I am inspired by the students and veterinarians that are part of this discussion group. Knowing that there are others who feel the same as me has given me the strength to keep working towards my goals."

Lori Donley - Class of 2002

Virginia-Maryland Regional College of Veterinary Medicine

"...The beauty of the AVAR Students listserve is that like-minded veterinary students can remain easily connected the world over. We can keep each other apprised of [such things as] existing alternatives to harmful physiology experiments, cruel "procedure labs," and terminal surgeries. Only by staying keenly informed can we successfully encourage our individual vet schools to adopt humane alternatives already in place at the more progressive vet schools."

> Linnaea Stull - Class of 2002 University of Illinois, College of Veterinary Medicine

"I am writing to acknowledge how heartfelt it is to see so many students sharing their concerns about animal welfare at the veterinary schools on your AVAR list serve forum. This is a really great venue for those vet students, sensitive to animal suffering, to share their concerns, problems and accomplishments with others of a similar ilk..."

> Gordon B. Stull, V.M.D. - Class of 1971 University of Pennsylvania, School of Veterinary Medicine

"In one simple act of creation... the *AVAR eGroup for Students* [has] brought us all out of our isolation and into a warm and supportive community of our true peers. Now we all share the companionship and comradeship of friends going through exactly the same sort of experiences as ourselves, albeit in different campuses scattered around the world. I'm sure this has helped and will continue to help some of us to somehow find the strength to carry on."

Andrew Knight - Class of 2001 Murdoch University, Murdoch-School of Veterinary Medicine If you are interested in participating in this eGroup, please send an e-mail message to:

Susan B. Krebsbach, D.V.M. Moderator, AVAR eGroup for Students (AVARStudents)

E-mail address: DrSBK@charter.net

Please include the following information:

Your name Your university and school/college name

Year in school (if applicable)

Month/Year of graduation or expected graduation

> *Type of degree Address Telephone number E-mail address*

Comparison of Alternatives Offered by Veterinary Schools

This table was developed to inform students, faculty, and other readers about the curriculum of individual veterinary schools and their use of alternatives to the harmful use of animals. The contents of this table were derived from a questionnaire that was sent to each veterinary medical school in North America in September 1999 and updates received thereafter. It was designed to clarify the table listings and provide current information without requiring interpretation from the AVAR. We invite any updated information or corrections.

Editor's Note: The editor wishes to thank Dr. Gary Patronek and several of his students from Tufts University and the Association of American Veterinary Medical Colleges (AAVMC) for their assistance with the design and format of the questionnaire.

	Invasive Procedures	Alternative offered to Invasive	Types of Alternatives offered to Invasive	Terminal Surgeries
School	Performed [^]	Procedures	Procedures	Performed
Auburn	YC, YE	YC, YE	Ca, S/N, SM	YC, YE
California	YC, YE	YC, YE	Ca, IP, SM	NC, YE
Colorado	УС, УЕ	УС, УЕ	Ca, ER, Ex, S/N, SM	ҮС, ҮЕ
Cornell	NC, YE	NE	Not applicable	NC, YE
Florida	NC, YE	YE	Ca, SM	NC, YE
Georgia	YC, YE	YC, NE	Ca, ER	УС, УЕ
Illinois	УС	YC	Ca, IS	YC
Iowa+				
Kansas	УС, УЕ	YC, NE	Ca, ER, S/N, SM	YC
Louisiana	YC, YE	YC, NE	Ca, ER, S/N	ҮС, ҮЕ
Michigan	YC	УС	ER	ҮС, ҮЕ
Minnesota*				
Mississippi	YC, YE	YC, NE	Ca, ER, Ex, S/N, SM	ҮС, ҮЕ
Missouri	YC, YE	NC, YE (some)	DP	ҮС, ҮЕ
North Carolina*				
Ohio	YC, NE	УС	Ca, SM	YC, NE
Oklahoma*				
Oregon	YC, YE	YC, NE	Ca, ER, S/N,	ҮС, ҮЕ
Pennsylvania*				
Purdue	YC, YE	YC, YE	Ca, ER, S/N, SM	ҮС, ҮЕ
Tennessee	УС, УЕ	УС, УЕ	Ca, ER, S/N	ҮС, ҮЕ
Texas A&M+				
Tufts	NC, NE	Not applicable	Not applicable	NC, NE
Tuskegee#				
Virginia Tech	УС, УЕ	УС	Ca, S/N, SM	YC
Washington	YC, YE	YC, YE	Ca, ER, Ex, IS, S/N, SM	ҮС, ҮЕ
Wisconsin	NC, YE	YE	ER, SM, SP	NC, YE (some)
Montreal	YC, NE	УС	Ca, Ex, S/N	YC
Ontario*				
PEI	YC, NE	УС	Ca, ER, Ex, S/N, SM	NC, NE
Saskatchewan*				

A	BBREVIATIONS						
ΙY	′ = Yes	ASP = Alternative Surgery Program	AD = Animal Dealer/Commercial organization	CAP= Computer-assisted programs			
Ν	I = No	Ca = Cadavers	AP = Animals who are purposely bred	PB= Plastic Bone Models			
Y	C= Yes, in core courses	DP = Decline to do procedure	AR = Animals once used in research	PS = Plastination Specimens			
Ν	IC= No, in core courses	ER = Extra rotations	BSH = Biological supply house	SuB = Suture Boards			
Y	'E= Yes, in elective courses	Ex = Externships	DLV = Donations from local veterinarians	SyM = Synthetic Models			
Ν	IE= No, in elective courses	IP = Instructor's prerogative	HS = Humane Society/Animal Shelter	TNA= Types used not available			
E	CA= Extra curricular activity	IS = Instructor and Student work	Mi = Military	VD = Video disk/tape			
		out mutual agreement	PVL = Previous veterinary school laboratories				
		S/N = Spay/Neuter Program	RK = Road-killed specimens				
		SM = Skills models	SB = Sale Barn/Auction				
		SP = Special projects	SH = Slaughter House				
			UF = University farm, herd, or colony				
^ = Certain procedures that may cause temporary discomfort		use temporary discomfort	VTH = Veterinary Teaching Hospital				
(e.g., venipuncture), were not considered invasive in this category.			WBDP = Willed Body Donation Program				
*	* = Did not respond to questionnaire even after repeated requests						

+ = Responded to questionnaire request but information was not provided.

= Declined to repond to questionaire.

Participate in Alternative Types of Skills Skills Models Alternatives offered Replace or Prevent offered to Source of Spay/Neuter Models Terminal Surgeries to Terminal Surgeries Cadavers Program Used Use of Animals YC, YE Ca, S/N, SM AD, HS, SB YC Y: CAP, SyM Y YE Ca, IP DLV, HS, PVL, SH, VTH, WBDP YC Y Y: SyM YC, YE ASP, Ca, ER, Ex, S/N, SM AD. AR. BSH. HS. SB. VTH YE Y: SuB, SyM Y NE Not applicable BSH YC Y: SuB, SyM Y Y YE AD, HS, RK YC Y: PB Ca, SM YC, NE Ca. ER AD, AR, HS, UF YC. Y: ECA Y: CAP Y YC Ca, IS AD, BSH, SB YC Y: CAP, SyM, VD Y YC YC, YE Y Ca, ER, S/N, SM HS, Mi Y: SuB, SyM YC, NE Ca, ER, S/N AR, HS, SB YC Y: CAP, PB, SuB Y YC, NE Ca, ER, SM YC, YE Y: TNA Y Info. not available YC, NE Ca, Ex, ER, S/N, SM AD, AR, BSH, SB, WBDP YC, YE Y: SuB Y Y YC (some), YE (some) AR, HS, SB Ν Y: SuB, SyM Ca, Dp YC Ca, SM AD, HS, SB, SH YC Y: SuB, SyM Y ASP, Ca, ER, S/N YC, NE BSH, DLV, SH Y: ECA Y: PB, SyM Y YC, YE Ca, ER, S/N, SM AD, AR, HS, UF YC, YE Y: PB, SuB, SyM Y YC, YE ASP, ER, S/N, SM AD, AP, HS, SB, UF, Zoo YC, YE Y: CAP, PS Y Not applicable Not applicable AD, AR, WBDP YC Y: SuB, SyM, VD Y YC Y ASP, Ca, S/N, SM AR, DLV, HS, PVL, SB YC Y: SuB, SyM YC, YE ASP, Ca, Ex, IS, S/N, SM HS, SB, SH, WBDP YC, YE Y: PB, SyM Y YE IS YC Y BSH, HS, SH, WBDP Y: CAP, SuB, PB, VD Y Info. not available Info. not available HS YC Y: SyM Not applicable Not applicable AD, HS, SB YC, YE Y: CAP, SyM Y

lternati **Resources Available**

Database:

Alternatives in Education

A database that contains thousands of alternatives, including alternatives to dissection and other laboratory uses of nonhuman animals.

The database can be searched or downloaded from the AVAR at http://AVAR.org/alted_db.htm

Contact: AVAR

All Media:

Videos, fax sheets, and information on nonanimal alternatives in medical education and trauma training.

Contact: Physicians Committee

for Responsible Medicine (PCRM) 5100 Wisconsin Avenue, Suite 404 Washington, DC 20016 Phone: (202) 686-2210 E-mail: research@PCRM.org Web site: www.PCRM.org

Animal Welfare Information Center (AWIC)

National Agriculture Library 10301 Baltimore Avenue, Beltsville, MD 20705 Phone: (301) 504-6212 Fax: (301) 504-7125 E-mail: awic@nal.usda.gov Web site: http://www.nal.usda.gov/awic

The UC Center for Animal Alternatives **School of Veterinary Medicine**

University of California, Davis, CA 95616 Phone: (530) 752-1800 E-mail: mwwood@ucdavis.edu Web site: www.vetmed.ucdavis.edu/animal alternatives/main.htm

Animal Rights Law Clinic

State University of New Jersey School of Law 15 Washington Street, Newark, NJ 07102 Phone: (973) 353-5989 Fax: (973) 353-1445

Organizations that provide dissection alternatives on a temporary loan basis:

The Humane Society of the United States (HSUS)

2100 L Street, NW Washington, DC 20037 Phone: General - (202) 452-1100 Direct - (301) 258-3042 E-mail: hsuslab@ ix.netcom.com Web site: www.hsus.org

The National Anti-Vivisection Society (NAVS)

53 West Jackson Boulevard Chicago, IL 60604 Phone: (800) 888-NAVS Fax: (312) 427-6524 E-mail: NAVS@NAVS.org Web site: www.NAVS.org

The Ethical Science Education Coalition (ESEC)

333 Washington Street, Suite 850 Boston, MA 02108 Phone: (617) 367-9143 E-mail: esec@ma.neavs.com

The American Anti-Vivisection Society (AAVS)

801 Old York Road, #204 Jenkintown, PA 19046-1685 Phone: (800)-SAY-AAVS E-mail: aavsal@aol.com Web site: http://www.aavs.org

Research and Development

Alternatives Research and Development Foundation 14280 Golf View Drive Eden Prairie. MN 55346

Phone: (612) 949-2409 Fax: (612) 949-2619 E-mail: ardfjmc@aol.com



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