

## SICP: CVT SCHOOL SPOTLIGHT

# The Cardiovascular Technology Program at Grossmont College

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**R**ick Kirby is the director of the Cardiovascular Technology Program at Grossmont College, a two-year course of instruction leading to an Associate in Science Degree. He has responsibilities for coordinating the administration of the program, and teaches both first and second year classes.



## Why and how did you become an educator?

I graduated from the Navy Cardiopulmonary School in Bethesda, Maryland in 1964. I served as a staff technologist at the Naval Medical Research Center at Bethesda, and later at the Naval Hospital in Portsmouth, Virginia. In 1971, I was assigned as the Senior Instructor in the Navy Cardiopulmonary School at the Naval Medical Center, San Diego. To prepare for that assignment, I attended a special course of instruction in the Techniques of Teaching and Naval Leadership.

While teaching in the Navy program, I discovered that, while I had always enjoyed the clinical arena and the association with my patients and the clinical staff, what I really enjoyed was sharing what I had learned with others. I was fortunate to be working for Dr. Arthur Hagan at that time. He was an extraordinary physician and at the same time, a true scientist. Dr. Hagan taught me a lot about cardiology over and above what I had learned in school and at the same time, stimulated my interest in research and especially the emerging field of echocardiography.

In 1973, while still on active duty in the Navy, I joined the adjunct faculty at Grossmont College and developed the noninvasive track of the program while completing the requirements for an Associate Degree in Cardiovascular Technology.

I continued my education at San Diego State University, where I completed a BA in Vocational Education and, 2 years later, a Master's Degree in Curriculum Design and Instruction. I joined the Grossmont faculty full time at the end of my Naval service and was appointed to my current position in 1988. I am registered in the invasive and noninvasive specialties.

## How long has your program been in operation?

In 1972, Dr. Willard Dellegar, a visionary leader who recognized the critical need for highly trained technologists in the emerging field of high-tech medicine, created our program. Dr. Dellegar and Ed Roto, one of the original faculty members, developed the original curriculum, which emphasized biomedical instrumentation and medical electronics repair techniques.

As the program continued to develop, it became apparent that hospitals needed technologists who could operate the medical electronics equipment, but not necessarily be qualified to repair it. Another faculty member, John Clark, joined the team and the curriculum was revised over the next three years to a more clinically oriented program.

Dr. Dellegar was active in promoting cardiovascular technology to the American Medical Association and the Committee on Allied Health Education as a recognized component of allied health. He was also instrumental in developing accreditation standards for CVT schools. The Grossmont Program was the first in the nation to be accredited by

CAAHEP (formerly CAHEA) in 1989, and has maintained accreditation through 3 five-year cycles.

## Describe your program syllabus, both clinical and classroom.

The CVT major is an integrated series of courses containing 53 units for the noninvasive and vascular specialties, and 55 units for the invasive specialty. Prerequisites for admission are Fundamentals of Chemistry (4 units with Lab), and 8 units of Human Anatomy & Physiology. Chemistry also has a prerequisite of college algebra.

The first year of the program is a combination of campus-based lecture and lab experiences. The second year combines lecture and labs on campus with 15 hours/week of clinical experience in local hospitals and clinics. There are a total of 532 hours of lecture and 1156 hours of lab/clinical instruction.

Students are admitted on a first-come, first-served basis upon verification of completion of the prerequisite courses with a grade of "C" or better. On admission to the program, students enter a one-year core curriculum of courses in mathematics, physics, advanced cardiovascular

anatomy, physiology and pathophysiology, medical electronics and instrumentation, and a clinical practicum, where they acquire basic skills in blood pressure measurement, electrocardiography, echocardiography, vascular duplex, and hemodynamic monitoring.

At the end of the second semester of the core curriculum, students select one of the three specialties: invasive, noninvasive, or vascular technology. Students complete Cardiovascular Pharmacology and Introduction to Clinical Experience during the summer between their first and second year, and then return for one year of concentrated study in their specialty.

## How many students do you accept each year? Have you seen an increase in applicants over the years?

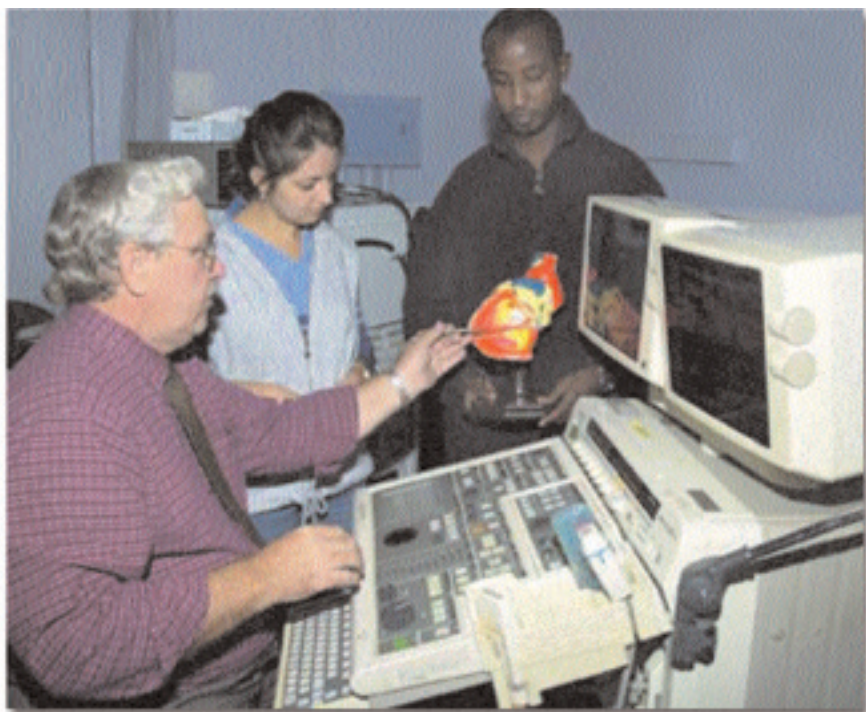
The program accepts 54 students in the fall semester each year. It currently receives more applicants than available spaces. Following a 3-year decline in applications, there was a dramatic increase in the number of applicants for Fall 2002. This trend has continued, and the application rate has increased to an even greater number for Fall 2003.

## What backgrounds do students generally have?

Students come from a wide range of backgrounds, including other allied health professionals (nurses, radiology techs, respiratory therapy techs), foreign-trained physicians, workers from the trades, students with computer science or other technical experience, single parents (some of whom are entering the workforce for the first time), and re-entry students. There are a few students directly from high school, but the program has recently developed a seamless curricular track to encourage high school students to consider a career in cardiovascular technology.

**The reasons I chose the CVT profession are many, but the main factor has been my long-term fascination with the human body and how it works. I majored in exercise physiology in college, and received my BS, but upon graduation, my career path was unclear. It was not until several years later that I stumbled upon the CVT program at Grossmont College and I immediately knew that this was a perfect fit for me. It is the perfect combination of science and technology, and provides limitless career possibilities. I have always known that I would be a lifelong student of science, and this field will no doubt provide abundant opportunities for growth and learning.**

*—Tobey Tyler, 1st year student*



Rick Kirby — Correlation of cardiac anatomy to ultrasound views of the heart.



Don Ridgway (standing, left) Vascular Technology. First-year student introduction to vascular duplex ultrasound.

### What is your program's annual tuition?

- California Residents pay \$11.00/unit x 53 units = \$583.00. (For the invasive specialty, \$11.00/unit x 55 units = \$605.00)
- Nonresidents pay \$152.00/unit x 53 units = \$8,056 (or for invasive, \$152.00 x 55 units = \$8,360.00)

Textbooks, malpractice insurance, health fees, lab coats and parking add an additional \$800 – \$1,000 to the total cost for all students.

### What textbooks are used in your classes?

The textbooks used in the program are listed below. The list includes texts for all three specialty areas.

- Ahrens, *Hemodynamic Waveform Recognition*
- Baim, *Cardiac Catheterization, Angiography*
- Barnes, *Doppler Ultrasound Evaluation of Peripheral Art. Dist. w/ Tape*
- Buckley, *Cardiovascular Pharmacology Syllabus*
- Buckley, *Med Elec & Inst Lecture Syllabus*
- Buckley, *Med. Instru. & Elec. Lab Manual*
- Buckley, *Grossmont Instructional Pack:*
  - 1) Lecture Syllabus
  - 2) Review Guide
  - 3) CD-Rom (Lectures)
- Bushong, *Radiologic Sci. for Technologists*
- Dirck, *Steadman's Concise Medical Dictionary*
- Edelman, *Understanding Ultrasound Physics*
- Katzung, *Basic + Clinical Pharmacology*
- Kern, *Cardiac Catheterization Handbook*
- Kern, *The Catheterization Handbook*
- Kern, *Interventional Cardiac Catheterization Hdbk*
- Kirby, *Student Information Booklet*
- Kummel, *Pocket Guide for Cardiac Electrophysiology*

- Lewis, *Sensible Analysis of ECG*
- Netter, *Ciba Coll. of Medical Illus.; The Heart*
- Otto, *Textbook of Clinical Echocardiography*
- Otto, *The Practice of Clinical Echocardiography*
- Pearson, *Principles of Electronic Circuits w/ CD*
- Reeder, *Using Multisim 6.1 Troubleshoot w/ CD*
- Reynolds, *Echocardiography Pocket Reference*
- Ridgway, *Cardio. Tech Lab Practicum*
- Ridgway, *Intro to Vascular Scanning*
- Ridgway, *Vascular Technology Review*
- Rumwell, *Vascular Technology: Illustrated Review*
- Zwiebel, *Intro to Vascular Ultrasonography*

In addition to the textbooks, students have access to the major medical journals through the college's Learning Resources Center. The department maintains an array of multimedia, including CD-ROMs, a videotape library, and access to the Internet. The electronics and instrumentation courses are taught primarily online, and one of our instructors has developed an online course for registry review.

### What types of clinical experiences do you offer students?

Students are assigned to clinical sites during the second year of instruction, where they are integrated into the department workload. They participate fully in all phases of the lab operations, including patient transport, assisting in the performance of diagnostic and interventional studies, and attending seminars, workshops, and conferences on car-

diovascular disease.

The initial phase of the clinical experience is primarily in observation, and as they acquire and refine their clinical skills, they participate fully in the performance of the studies. The students are rotated to various sites in order to maximize their experience with the variety of methods used by different labs, and to gain experience with a wide array of medical instrumentation.

### How "hands on" does the student become and when do they start this exposure?

Clinical experience begins in the summer between the first and second years of the program. By the second semester of clinical training, students are expected to participate fully in the preparation and performance of all diagnostic and interventional procedures.

### Are your students cross-trained?

All students acquire fundamental skills in all three specialties. Full cross-training only occurs if the student returns to the program for a full year of education in another specialty, as specified in the *Guidelines & Essentials* of the Joint Review Committee on CVT Education.

### Who does your classroom and clinical teaching?

The faculty is composed of 4 full-time and 8 part-time teachers. In addition, technologists employed in the local clinical affiliates (most of whom are graduates of the program) serve as proctors/mentors for students during the second-year specialty training.

### What is the employment outlook for your graduates?

OUTSTANDING! There is 100% placement for graduates who want to work. A small percentage of graduates elect to continue into some form of higher education, but the vast majority enters the workforce as entry-level cardiovascular technologists.

The number of phone calls, emails, and letters received by the program from hospitals seeking our graduates indicates a nationwide shortage of qualified technologists. As the field grows more technical, advances are made in the clinical arena, and the population ages, it follows that more technologists will be required to care for a growing population of patients with cardiovascular disease.

### What are typical starting salaries for graduates?

The most recent survey of local hospitals indicates that graduates begin at an average salary of \$38,000 – \$42,000 per year. That is a moving target, since beginning salary levels increase each year. In recent years, hospitals and medical centers have sent recruitment teams to meet with our students to try and attract them to their institution. Many offer a signing bonus and full moving expenses, along with excellent benefits packages. The location of the institution is a key determinate of salaries and there are wide variations from hospital to hospital. There are many positions in all parts of the country that remain unfilled because of the shortage of qualified technologists.

### What career opportunities have past graduates experienced?

The majority of graduates from the Grossmont program are employed as clinical cardiovascular technologists and make their living in the cath labs, echocardiography labs, and vascular

(A question for Grossmont students.)

## Why did you choose to become a CVT?

- I decided to become a CVT because it's a high tech and interesting field that most people don't even know about. I was in a nursing program, working toward a degree as an RN, when a woman who worked with me told me about the CVT program. It was just what I was looking for — a specialized field of study of the vascular system, and I like the work environment.

— Mia Verbonitz, 2<sup>nd</sup> year student

- I am interested in a branch of CV technology that offers the most opportunity to assist in interventional as well as diagnostic procedures. I am drawn to the immediacy and focus of the "surgical" arena versus the longer-term aspect of chronic therapy, as in some other allied health fields.

— Cliff Nielson, 2<sup>nd</sup> year student

- To take part in the prevention of cardiovascular disease and the prolongation of life.

— Charisse Richards, 2<sup>nd</sup> year student

- I chose the CVT program because of two main reasons: 1) I have always had an interest in the sciences, which led me to my degree in biology;

2) Knowing that the technological advancements in cardiology are improving the quality and longevity of life for people today, I want to be able to look back at the end of my career and feel that my life's work was spent helping others and their families. CVT provides both a prevention and cure for today's cardiovascular ailments. The nationwide reputation of the Cardiovascular Technology Program at Grossmont College brought me here to learn and grow in this particular field of medicine.

For me, although helping to save a life or preventing a grave situation is an incredible reward emotionally, it's knowing that the patient will live to see their children graduate, be able to play with their grandchildren and celebrate those anniversaries in the future that fuels my motivation.

— Lori Woodruff, 1<sup>st</sup> year student

- I came to the CVT program not sure of what I wanted to do with my life, just knowing I wanted to change my career as a veterinary assistant because it wasn't going anywhere. I went to my counselor for some advice and he recommended the CVT program as an option. At this time, I coincidentally talked to Patrick Coyle about where I was in my life and he too recommended the CVT program. Now, here I am in the program and I'm enjoying every bit of it.

— Melissa Atkins, 2<sup>nd</sup> year student

- My interest in the CVT program was sparked by a biology student at another college. My continued interest is a result of a telephone conversation with Rick Kirby. I really enjoy working with people.

— Jacob Harris, 2<sup>nd</sup> year student



Jerome Passman (standing, left), Noninvasive Cardiovascular Diagnostics with first-year students in the Echocardiographic Lab.

### CVT SCHOOL

Continued from page 53

labs in major hospitals and clinics throughout the nation. Others are teachers, medical researchers, authors, department managers, clinical applications specialists, and medical sales representatives.

#### How successful have graduates been in passing the RCIS exam?

Pass rates for our graduates have been excellent, as reported by Cardiovascular Credentialing International (CCI) and the American Registry of Diagnostic Medical Sonographers (ARDMS). Rates for Grossmont graduates vary from 90% to a high of 100% two years ago on the Ultrasound Physics exam administered by ARDMS.

#### How has the CVT program evolved over the past 5 years?

The evolution of the curriculum has occurred primarily in response to growth in the types of diagnostic and interventional procedures performed by physicians. In the current academic year, we increased the number of units required in the invasive specialty to include more instruction in electrophysiology and radiation physics.

Similar growth has occurred in the noninvasive and vascular arenas. We've added additional content in the areas of transesophageal and stress echocardiography, and transcranial and abdominal Doppler techniques. A major challenge for the faculty is to monitor the scope of practice and maintain the currency of the curriculum.

#### What advice can you give to students

#### considering CVT school?

First, be sure that you enjoy "technical" things, like computer science, laser technology, and medical electronics. Entry into a program requires a tremendous commitment of time and energy in prerequisite course work, insuring that all immunizations are up to date, obtaining physical and dental examinations, and acquiring training in Basic Life Support. It would be unfortunate to complete these requirements and then find out that you are frustrated (or intimidated) by the technology involved.

Second, complete college-level courses or review relevant content in Language and Rationality (mathematics, writing & composition) and the physical sciences (biology, chemistry, anatomy & physiology, and physics).

Finally, be sure that you are not averse to working with critically ill patients, which of course is the most critical preparation of all. You must recognize that all patients do not have positive outcomes despite our best efforts. People die, even neonates who are born with heart disease. When that occurs, potential CVTs must be prepared to move on to the next patient and recognize that although we're not always successful in caring for every patient, when all is said and done, our role is critical to helping the patient feel better and live longer! What could be better than that?

A career as a cardiovascular technologist is a wonderful way to provide for your personal and financial growth, and at the same time, perform a tremendous service to others.



Jerry Buckley (standing, left), Invasive Diagnostic & Interventional Technologies with second-year students reviewing hemodynamic monitoring techniques.

### What do you consider unique about your program?

The Cardiovascular Technology Program at Grossmont College has always been on the cutting-edge. We have graduated approximately 1600 technologists who are working in labs across the nation. Many are managers, applications specialists, teachers, and medical researchers.

A major strength of our program is our faculty. They are diverse, creative, innovative, and dedicated to student success. Don Ridgway has authored two textbooks in vascular technology; Jerome Passman, a text on electrocardiography; and Jerry Buckley has developed the medical electronics and invasive technology courses in an online format.

The program is fully staffed and has a wide array of state-of-the-art medical instrumentation to support the instructional program. Major equipment items include six ultrasound machines: two of which are Philips 5500s; two MacLab 5000 Digital Platforms for the Cath Lab, and this past summer, we received a MacLab 7000, which puts our program ahead of most hospitals in the San Diego area. We also have two transcranial Doppler machines and a variety of computerized electrocardiographs, a 25-workstation computer lab, and our classrooms have direct access to the Internet.

Our students are taught and mentored by technologists in the clinical affiliates who are predominately graduates of the program, which brings special meaning to the phrase, "Been there and done that."

The program has the full support of the college administration and is highly respected by all constituents of the campus community, from the

science, math, and general education departments to the Counseling Center and all aspects of student services. Our labs are a showcase for the college and are usually at the top of the college president's list for visiting VIPs, including state and national legislators and media personalities. There is also tremendous support from our local hospitals and clinical affiliates. They provide clinical training for our students and donate equipment for use in our labs. The medical equipment industry, especially Philips Medical Systems, GE/Marquette, Freeland Systems/ Stratagem LLC, and Fukuda Denshi America Corporation, support the program through equipment donations, huge discounts on purchases, and placing state-of-the-art instruments in our labs on permanent loan. Local physicians and technologists (notably, Howard Dittrich, MD and Teri Dittrich, RCS, ARDMS) provide lectures to our students and provide fiscal support for the program.

### Can you share a particularly funny, bizarre or proud teaching moment?

My first teaching duties as a member of the full-time faculty were a lecture class in cardiovascular anatomy and physiology (A&P), a couple of sections of the lab practicum, and coordination of the non-invasive track.

There was a student in the A&P class with whom it proved extremely difficult for me to establish a professional, teacher-student relationship. It seemed that we were at odds at most every turn, from teaching to testing and especially in our expectations of each other. I demanded excellence and I was never quite sure what the student expected of me. Over the course of the year, we

became more and more distant in our ability to communicate and one day had a very heated discussion in my office.

At the end of the term, the student passed all of my courses and then, to my astonishment, selected the non-invasive track for specialty training. This set the stage for another year of working together and continuing conflict. After graduating from the program, the student became the Chief Tech in the cath lab at a major university medical center within a relatively short period of time.

Several years later, our paths crossed at a meeting of the American College of Cardiology. We met on the sidewalk outside the convention center, and amazingly, I got a big smile and a hug instead of a frown and a shrug. The feeling was mutual! That was the day I received all of the affirmation I'll ever need for trying to be a teacher. **CLD**

*Note:* Readers, particularly Grossmont alumni or those interested in the CVT program, are invited to contact Rick Kirby at: [Rick.Kirby@gcccd.net](mailto:Rick.Kirby@gcccd.net)