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Cover art: Justin Duncan is an Exercise and Sports Science Major at the University of Tulsa. He is from Brampton, Canada, just outside of Toronto. Originally Justin planned to go to art school, but when he started competing in sports he found a new interest in sports medicine. He is now looking forward to a career in physical therapy and is also hoping to turn professional in track. Justin took Anatomy and Physiology from Karen McMahon in fall, 2008.
HAPS-EDucator is the official publication of the Human Anatomy and Physiology Society (HAPS) and is published four times per year. Major goals of the Human Anatomy and Physiology Society are: to promote communication among teachers of human anatomy and physiology in colleges, universities, and related institutions; to present workshops and conferences, both regional and national, where members can obtain information about the latest developments in the health and science fields; and to encourage educational research and publication by HAPS members. HAPS was established in 1989.

Annual membership dues are $65 for full-time faculty, $50 for retired, part-time faculty, and students. Annual membership renewals shall be due on January 1 or July 1. New members shall renew on whichever date most closely follows the date of their initial membership. Information on additional membership categories, meetings, and more can be found at: http://www.hapsweb.org. Correspondence should be directed to: HAPS, PO Box 2945 LaGrange, GA 30241 or (800) 448-HAPS (4277) or (706) 883-8215 (fax).

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Papers for publication, requests for information, positions available and wanted, and letters to the editor are welcomed. Articles may be submitted to the editor as a Microsoft Word or Word Perfect file as an e-mail attachment. If references are included, please follow the methods suggested in Scientific Style and Format: The CSE Manual for Authors, Editors, and Publishers 7th Edition, Style Manual Committee (Council of Biology Editors) Cambridge, Cambridge University Press 2006 or see the reference guide on the HAPS-EDucator page of The HAPS website (hapsweb.org).

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DEADLINES FOR SUBMITTING MATERIAL TO HAPS-EDucator: August 1 (Fall issue); November 1 (Winter issue); February 1 (Spring issue); April 15 (Summer issue).

CONTACT THE HAPS-EDucator Editor: HAPS, PO Box 2945 LaGrange, GA 30241 orhapsed@hapsweb.org.
Greetings from sunny San Diego!

I am pleased to write to you about the latest developments in our Society at the midpoint of the academic year. By the time you read this, you are likely to be well along in your spring term. Best of luck to you in schooling your students in the fundamentals of human structure and function.

The Board of Directors’ most recent challenge is associated with growing the leadership pool associated with the HAPS Institute (HAPS-I). This continuing education program that offers graduate credit from the University of Washington reflects the true mission of our Society by promoting excellence in the teaching of human anatomy and physiology. Presently, Kevin Patton largely manages HAPS-I, in conjunction with a committee of volunteers. With the exciting demand from our members for more HAPS-I programming, it is necessary to expand the leadership positions. Letters of interest are being solicited for the following positions that are compensated with a modest stipend: Director, Associate Director, Marketing and Communication Director, and Webmaster. An advertisement outlining job duties is included in this issue. Please consider sending a letter of interest or nominating a colleague. It is imperative for the survival of HAPS-I that new leadership talent is infused into the program.

Another exciting development for HAPS is the efforts directed towards creating a HAPS foundation. Phil Tate is leading a small committee in the process of exploring the financial and legal aspects of this endeavor. While the details of the scope and mission of this foundation are still being examined, it is safe to say that this project will focus on raising, growing, and distributing funds that support programs and instructors in human anatomy and physiology education. It is my hope that I will be able to present the fine details of a new foundation at our annual meeting in Baltimore. If any of you have talents you can contribute towards this effort, please contact me directly.

Speaking of the Baltimore conference, it is my hope that you plan to attend. The meeting is planned from May 23-29, 2009, and will be headquartered at the Renaissance Hotel along the beautiful Inner Harbor. The Community College of Baltimore County will host our workshops. Many thanks to conference coordinator Ellen Lathrop-Davis and her planning committee for investing endless hours of their valuable time in the development of this conference. As many of you know, the educational and networking opportunities that surround the HAPS conferences are endless. The additional social activities result in a conference that is both professionally and personally rewarding. From the Inner Harbor, Fells Point and Camden Yards, to our nation’s capital, the Baltimore conference should prove to be our best meeting yet. Please consider registering today.

President-elect John Waters, along with the nominating committee that he chaired, will soon announce the slate of candidates for our spring election. All voting will be conducted online, and results will be announced in Baltimore at our annual business meeting. You will soon receive an email detailing the voting process. Please be sure to visit the online polls and cast your ballot.

Finally, on behalf of the entire HAPS Board of Directors, I wish to extend our sincere gratitude to you for your support. Do not hesitate to contact your regional director if you have any questions or concerns. Contact information for all Board of Director members is listed beside the table of contents of this issue.

Once again, best of luck in your current semester, and thank you for your commitment to HAPS!
We’re already in our THIRD big season here at HAPS Institute! Our program of continuing professional education for anatomy and physiology professors has grown by leaps and bounds . . . and we’re not done yet!

During our third academic year we offered our first fall course, Paul Krieger’s popular *Using Cadavers to Teach Anatomy & Physiology*, which featured a workshop in the cadaver lab at Grand Rapids Community College. We hope to offer this and other courses during the fall in the coming years.

Once again, HAPS-I is offering courses in conjunction with the HAPS Annual Conference in May.

*Advances in Anatomy & Physiology 2009* (2 credits)
Ellen Arnestad leads a deeper exploration of all the topics presented during the Update Seminar program. Formerly called “Topics in A&P,” this year the course will feature a 90-minute face-to-face session on Tuesday, following the Update Seminar program (Sunday and Monday).

*Advanced Cardiovascular Biology: The Heart at Work and Rest* (3 credits)
Dan Lemons offers a new HAPS-I course -- the first of a series of two cardiovascular courses. Dan is a master teacher well known to HAPS members through his many popular workshops.

*Advanced Neuroendocrine Biology* (3 credits)
Another new course this year – this one focused on the theme of this year’s Annual Conference. Adam Rechs (University of California Sacramento) helps you learn more about the complex regulatory systems of the body.

*Advanced Respiratory Biology* (3 credits)
This course is a reprise of last year’s popular course. This time, Mary Pat Wenderoth (University of Washington Seattle) steers HAPS-I participants through some of the major concepts of human respiration.

All of the conference-related courses require online and independent readings and other work beginning on April 15 (prior to the conference). Also required are attendance at an orientation session on Saturday at 3:00 pm, attendance at Update Seminars (for most courses) on Sunday and Monday, and participation in specific workshop sessions on Tuesday or Wednesday.

HAPS-I will again offer the *completely online* course *Best Practices in Hybrid & Online Teaching of Anatomy & Physiology* (2 credits) this spring. Tom Lancraft returns, this time with Janice Yoder-Smith, to facilitate an interactive look at methods that work well for online and blended courses in A&P. This course runs concurrently with the conference-related courses.

HAPS-I is also working on some courses linked to Regional Conferences. In future years, we hope to offer an ongoing program of course-conference combination opportunities.

We are also in the process of developing some cadaver-based anatomy review courses that will use the HAPS-I hybrid online/onground model. We are hoping to offer these on an ongoing basis in different parts of North America.

The best way to find out specific details of HAPS-I courses is the HAPS website at wwwhapsweb.org. Simply click on the HAPS Institute link in the left menu bar! Most of our courses fill rapidly once they open. To get an “early warning,” sign up for our HAPS-I update email list at http://groups.google.com/group/haps-i-update.
The most surprising thing I (Bowne) learned at HAPS 2008 was that some of us are teaching nursing students who do not think they need to take an A&P course—who think they will pick up enough physiology in their nursing classes. I was astonished and so were all the nurses I asked about this when I got back. Yet, when you think about it, you can see how a first-year nursing student might feel that way. Beginning nurses do not always know much about what a nurse does.

In spring 2008, I surveyed nursing students in my sophomore A&P course to find out how they used the course content (Table 1). Most students identified several ways in which they had used the material, but few of those were directly related to nursing. At this level, before they had begun clinical courses, most of them used A&P in a social context to explain, diagnose, and interpret their friends’ or family’s medical issues. One use, to ‘understand medical professionals,’ sounded more work-related than it was; among the ‘medical professionals’ identified were those on prime-time television.

<table>
<thead>
<tr>
<th>Used A&amp;P for:</th>
<th>n=39</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpret patient conditions</td>
<td>9</td>
</tr>
<tr>
<td>Understand medical professionals</td>
<td>12</td>
</tr>
<tr>
<td>Communicate with professionals</td>
<td>3</td>
</tr>
<tr>
<td>Interpret medical treatments/lab values</td>
<td>10</td>
</tr>
<tr>
<td>Diagnose self/family</td>
<td>10</td>
</tr>
<tr>
<td>Explain to acquaintances/family</td>
<td>11</td>
</tr>
<tr>
<td>Impress others/sound professional</td>
<td>4</td>
</tr>
<tr>
<td>Understand material in other classes</td>
<td>4</td>
</tr>
<tr>
<td>Practice teaching</td>
<td>1</td>
</tr>
<tr>
<td>Haven’t used it yet</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 1: Sophomore nursing students’ end-of-semester summary of how they used the content of a one-semester integrated Anatomy and Physiology course outside the class.

With students unclear on the concept, it is sad but true that they may not see the vital role A&P plays in their nursing career goals. If their A&P instructor also lacks nursing experience, he or she may be at a loss for convincing examples.

This is the first of a series of reports on my sabbatical research, ‘How Nurses Use Physiology.’ Over the course of this academic year I will be interviewing and shadowing nurses, gathering examples we can use to show our nursing students how A&P is linked to the important tasks and issues they will face when they are at the bedside.

Nurses Need Anatomy and Physiology for… Assessment
Not class assessments (if your school uses that terminology), but patient assessment. If your class gives ‘assessments,’ though, students will understand the difference between a cookbook evaluation of their work and an informed evaluation. They want you to ask questions that focus on the important material, not on trivia. When they write a paper, they do not want you to just score them on their conclusions, but to evaluate the quality of their reasoning, based on what you know about learning and about them, and give them useful feedback. How much more important is it for them to do this same kind of careful assessment with their patients?

Most nursing students will be taught patient assessment using the SOAP (or SOAPE) model—they assess Subjective and Objective evidence, Analyze it, Plan care, and, in some forms of the model, Evaluate the patient’s response. They may learn a systems-based assessment protocol (nervous, cardiovascular, respiratory) or a head-to-toe protocol.

One of my nurse interviewees, Mary Kay Feeney, chose to use the example of the radial pulse, the most basic of vital signs, to discuss how she uses physiology. Taking vital signs is among the activities that can be delegated to nursing assistants in the hospital. That means that you, as the patient, might have your pulse taken by someone who has never had A&P. Would it matter? Do your students think it would matter? While vital signs can be delegated legally, whether they should be is a topic of debate among nurses and within nursing organizations. “There’s a reason they’re called vital signs,” Kathleen Vollman said in a June 2008 presentation for the Greater Milwaukee Area chapter of the American Association of Critical-Care Nurses (AACN) (Vollmann, 2008).

When they graduate, your students will be on the front lines of this debate. They will have to decide when, and for which patients, the task of taking vitals should be delegated; so they need to know what a trained nurse can observe from it, as opposed to what a nursing assistant can be trusted to report. Sometimes delegating this procedure makes sense, and other times it deprives the nurse of important information.

How many things can your nursing students imagine themselves finding out just from taking a pulse? Here are some examples, with questions my interviewee suggested that nursing students ask themselves and her answers.

1. A patient’s heart rate seems steady, but then you notice a beat coming just before or just after you expect it to. The pattern is repeated. What chamber of the heart is responsible for the pressure waves you feel in the pulse?

In this example, the nurse may be detecting premature ventricular contractions. Often the early beat is not as obvious as the pause following it before the next normal beat, which is stronger than the rest due to the longer filling time of the ventricles.
Nurses Need Anatomy – continued from page 5

2. A patient’s heartbeat is seriously irregular; you cannot predict when the next beat will occur. Yet the patient does not appear to be having a heart attack. What part of the heart controls the rate and rhythm of contraction?

In this example, the nurse may be detecting atrial fibrillation, which is often described as causing an ‘irregularly irregular’ heartbeat.

3. A patient has pre-existing atrial fibrillation. The nurse goes in to give prescribed digitalis and finds the pulse regular and below 60. Is she observing a normal consequence of atrial fibrillation, or a normal consequence of digitalis?

In this case, my interviewee was detecting possible digitalis toxicity. She notified the physician, who ordered an EKG.

A good nurse can also estimate blood pressure from the pulse, by how strong it is.

4. A patient is dozy, pale, and has a slow, weak pulse. His blood pressure is low. What could have caused the low BP?

The low heart rate in this case suggested that the patient was going into cardiogenic shock. His blood pressure was dropping due to decreased cardiac output because of the low heart rate.

5. A patient is nervous, disoriented, and has a fast heart rate and weak pulse. Her skin is cold and damp. She also has low blood pressure. What is causing her signs and symptoms?

The sympathetic system is active as this patient attempts to compensate for her low BP. Possible causes the nurse might investigate include dehydration, which she can check by observing skin turgor as she takes the pulse. She might also suspect internal bleeding in a postsurgical patient.

6. The patient has a fast heart rate but his pulse is weak. His skin is flushed and warm. But his blood pressure is also low. What could be decreasing it?

The warm, flushed skin should make the nurse think about vasodilation and decreased peripheral resistance. Fever could be causing vasodilation, but what could be causing a fever? This patient could be developing sepsis, a serious medical emergency.

While taking the pulse the nurse can notice more about the skin than turgor and temperature. Is the skin fragile with lots of bruises? That could indicate abuse, bumping into things from dizziness or from gait disturbances, or bleeding disorders. Is the skin pale (shock? anemia?) or very flushed (sunburn? fever? allergic reaction?)?

An experienced nurse may catch alterations in muscle tone. Is the wrist flaccid? Is it rigid, as in spastic cerebral palsy? Is there a tremor, as in Parkinson’s Disease?

Are the joints of the hand bent and knobby, as in arthritis? Do the nail beds have good blood return after being pressed, indicating adequate circulation in the hand? Are nail beds blue with cyanosis? Are the fingers clubbed, as in congenital heart disease or long-standing chronic obstructive pulmonary disease (COPD)?

7. The patient has blue nail beds. She says “I have trouble walking up the stairs; I get short of breath when walking up the stairs.” What is the next question your students would ask and why?

This situation made my interviewee think of congestive heart failure, respiratory infection, or COPD. She asked, “Can you go up part of the stairs; has it always been that way?” and determined how quickly the problem had developed, to distinguish between an acute condition and COPD.

Your students might ask themselves why she suspected congestive heart failure, when the complaint was about breathing. They also might discuss why one of her next questions was about unexpected weight gain.

Taking the pulse seems so basic, but a nurse who is thinking about the body systems and their interrelations can catch a wide variety of dangerous situations with this simple action. A nurse who has delegated this task or is not thinking about those interrelations, on the other hand, can miss important information. And a nurse may have 5 or 6 patients. Which ones can the nursing assistant take vitals on? No wonder the American Association of Critical-Care Nurses has published a delegation handbook! To give a critical-care nurse the last word: “Although nursing tasks may be delegated, the nursing process functions of assessment, evaluation, and judgment must not be delegated.” (Currie 2008)

References


HAPS-I Leadership Opportunity!

HAPS-I Is Looking For New Members To Staff Its Current Leadership Team

One-year term for 2009 with the option to renew

Modest stipend!

The positions that need to be staffed are:
- **Director**
- **Associate Director**
- **Marketing and Communication Coordinator**
- **Webmaster**

Apply for positions by sending a brief cover letter stating your qualifications and identifying what it is that you will bring to the position.

Send your letter of interest for consideration to Kevin Petti at: kpetti@sdcdd.edu

Job descriptions are as follows:

**Director**
- Has overall responsibility for managing HAPS-I
- Supervises other paid and unpaid members of the Leadership Team and Faculty
- Assigns duties and tasks to other members of the Leadership Team
- Coordinates support from HAPS HQ
- Represents HAPS-I to the membership, steering committee (SC) and its constituent chairs and committees as well as the HAPS Board of Directors
- Represents HAPS-I to partner associations, sponsors, and the world at large
- Works with partner institutions, including University of Washington, to develop articulation agreements, promote integration with certificate or degree program, and to develop other academic partnerships
- As part of HAPS-I Budget Committee (Director, Treasurer, Manager), assists with development and management of HAPS-I budget

**Associate Director**
- Assists the Director
- Substitutes for the Director when the Director is unavailable
- Coordinates the overall academic functions of HAPS-I, including faculty, curriculum, assessment, credit, instructional methods and delivery, interaction with HAPS-I scholars

**Webmaster**
- Implements and supports web pages and webpage components related to HAPS-I
- Coordinates and supports web-based tools used in HAPS-I, such as Google Groups and HAPS-I calendar
- Works with HAPS webmaster to design and support HAPS-I web presence
- Works with Marketing/Communications Coordinator in developing and maintaining web and Google Group content

**Marketing and Communication Coordinator**
- Promotes awareness of HAPS-I within HAPS and partner societies
- Cooperates with HAPS public relations officer
- Promotes awareness of the HAPS-I program
- Manages production and distribution of marketing and awareness tools
- Manages production of shirts, pins, and other logo items as well as brochures, postcards, banners, other marketing materials
- Maintains HAPS-I presence in HAPS media
- Manages production of a regular column in the HAPS-ED and other publications
- Manages insertion of ads in HAPS-ED
- Works with Scholarship Committee to promote and manage HAPS-I scholarships
- Works with HAPS Marketing Manager to develop and maintain satisfactory relationships with program sponsors
- Manages the setup/teardown of HAPS-I table at annual conference
- Coordinates volunteer staffing, supplies and exhibits at annual conference table
- Works with HAPS and HAPS-I webmasters in web presence
- Serves as primary coordinator of alumni relations
- Coordinates the release of broadcast emails relating to HAPS-I activities
- Manages HAPS-I Update Google Group (email list)
Dr. Hunt presented high-altitude physiology as an example of decreased oxygen delivery, the basic problem in all kinds of shock. Oxygen delivery depends mainly on cardiac output and blood oxygen content: \[ DO_2 = CO \times 10 \times [(Hgb \times S_AO2 \times 1.31) + (P_O2 \times 0.0031)] \]. The tissues of people at high and low altitudes maintain equal \( P_{O2} \), even though the ambient \( O_2 \) levels are vastly different. How is this managed? It is managed through adaptations in ventilation, ventilation-perfusion matching, and \( O_2 \) capacity.

1. Adaptation in ventilation
   At sea level, we assume that minute ventilation controls \( P_{CO2} \) and inhaled \( O_2 \) fraction (\( FiO2 \)) controls \( P_{O2} \). In persons adapting to high altitude, increased minute ventilation appears to increase \( P_{O2} \) by removing \( CO_2 \) from the alveoli, leaving more room for \( O_2 \) (\( PB = \) barometric pressure).
   \[ PAO2 = [(P_b – P_{H2O}) \times FiO2] – PACO2/RQ \]
   Therefore, as \( P_{CO2} \) decreases, \( PAO2 \) will increase.

2. Alterations in ventilation/perfusion matching
   West’s zones of the lung explain that all people have some ventilation-perfusion mismatching, due to gravity. Blood tends to flow to the lower areas of the lungs because the low-pressure pulmonary circulation (30/15 mm Hg) provides little resistance to the force of gravity. Air, on the other hand, tends to fill the upper areas of the lung. This means that the upper regions of the lungs are well ventilated but poorly perfused (physiologic dead space), while lower regions are well perfused but poorly ventilated (shunt). This gives the average person a 5% shunt, in which 5% of the blood flowing through the pulmonary circuit does not encounter ventilated alveoli.
   Clinically, a shunt is addressed by increasing positive end-expiratory pressure, or the pressure of air left in the lungs after exhalation. This forces more alveoli open, improving ventilation in the lower regions of the lung. Mountain climbers accomplish this by pursed-lip ventilation, in which exhalation is restricted to maintain a higher pressure within the lungs. They face an additional challenge, though, in that fluid collecting in the interstitium of the lungs increases the diffusion distance between the alveolar lumen and the pulmonary capillaries.

3. Altering \( O_2 \) capacity
   People who live at higher altitude can develop a 33% increase in hemoglobin, with hematocrits of up to 60%. This is due to erythropoietin secretion, and adaptation may take 3 months. Questioners asked about the effect of this high hematocrit on blood viscosity. Dr. Hunt answered that the commonly used hematocrit goal of 30% is actually based on \textit{in vitro} experiments and is now regarded as far less important; in most situations, increased blood viscosity is not an important consequence of increased erythropoiesis. Immunosuppression is now seen as a more important consequence.
   In addition to increased \( O_2 \) capacity, mountaineers show adaptations in blood flow similar to those of other athletes, with increased ejection fractions leading to increased stroke volume. However, mountaineers in the arid nature of the mountain environment face a problem most other athletes do not.
   The Starling mechanism tells us that, within normal physiological limits, cardiac contractility is most effective when the myocytes are stretched – that is, when the heart is filling with sufficient blood (preload). Dehydration is a direct threat to preload in mountaineers. In fact, 80% of the fuel carried up the mountain must be used to melt ice and provide sufficient water to maintain blood volume.
   Oxygen affinity is also altered in mountaineers. Lactic acid, \( CO_2 \), and 2,3 DPG (a byproduct of anaerobic metabolism) all shift the \( O_2 \) saturation curve to the right, increasing \( O_2 \) release to the tissues. In this manner, tissues succeed in maintaining a constant level of \( O_2 \) extraction from the blood. Whether at sea level or at high altitude, tissues extract approximately 250 mL \( O_2 \)/min. What changes is the amount of \( O_2 \) remaining in venous blood leaving the tissues (mixed venous \( O_2 \)); in fact, this is such a good indicator of oxygenation that it is measured during surgery, via a pulmonary artery monitor on the Swann-Ganz catheter.
   When mountaineers fail to adapt, they can develop three different high altitude syndromes: High Altitude Cerebral Edema (HACE), Acute Mountain Sickness (AMS), and High Altitude Pulmonary Edema (HAPE). Fifty-three percent of trekkers in the Himalayas (14,000 feet) develop one or more of these syndromes, as do 67% of those on Mt. Ranier (14,405 feet) and 12% of Colorado skiers (8,000 feet). The site of the most fatal altitude reactions is Kilimanjaro, mainly because it is the least expensive to climb and, therefore, the busiest.
   HACE is the most serious high altitude syndrome, causing an increased intracranial pressure and herniation, compressing brain structures and leading to death unless treated. It occurs at elevations above 12,000 feet and is more likely with rapid ascents. AMS is the least serious of the high altitude syndromes, and develops 4-6 hours after exposure to altitudes over 10,000 feet. It causes headache, nausea, and malaise, resolving in about 3 days. HAPE takes 1-3 days to develop, and appears to be due to global

**John Hunt, MD, MPH, Presenter**
LSU Health Sciences Center
New Orleans, LA

**Pat Bowne, Summarizer**
Alverno College
Milwaukee, WI
pat.bowne@alverno.edu
pulmonary vasoconstriction in response to low \( pO_2 \). The signs are typical of pulmonary edema, including dyspnea, rales, and pink, frothy sputum. One audience member asked the interesting question of why this should result from pulmonary vasoconstriction, which presumably happens in the precapillary arterioles and, therefore, should decrease capillary pressure. Dr. Hunt noted that it is obvious that more is going on in pulmonary vasoconstriction than a superficial look will explain.

The best prevention of mountain sickness is to go down the mountain again. Given mountaineers’ reluctance to do this, treatments have been devised ranging from the Gamow bag (a portable hyperbaric chamber) to the climb high/sleep low protocol, in which climbers carry two sets of gear and climb high during the day, cache one set, and descend to sleep at a lower altitude with the second set. Pharmacological treatments include acetazolamide (a carbonic anhydrase inhibitor) and nifedipine, a calcium channel antagonist which counteracts pulmonary vasoconstriction. A questioner asked about Viagra, and Dr. Hunt explained that Viagra’s first clinical trials had in fact been for its vasodilatory and antihypertensive action, and that erections had merely been reported as a side effect. It is used in surgery to block reflex pulmonary vasoconstriction in the lung remaining after pneumonectomy.

Questions from professional exams were interspersed, both to motivate any medical students in the audience and to give the rest of us an idea of how our students might be asked to apply the material.

---

**Poster Session:**

**The Effect of Learning Assistants in Anatomy & Physiology**

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**What are Learning Assistants?**

- Specially trained peer tutors who help students in the learning process
- Paired with professor to work as a team
- Complete 75 hours of training
- Have a 3.0 or better GPA and B+ or better in the tutored class
- Recommended by professor for the position
- Have excellent communication skills

**Introduction**

Students studying anatomy and physiology are often in need of extra help outside the classroom in order to succeed in this challenging course. Instructional methods that increase retention and course completion rates are those that are student-centered, such as individual attention, mastery of study skills, and peer tutoring. The implementation of learning assistants (LA) in several sections of Anatomy & Physiology I: Allied Health during the fall, 2006, semester proved to be a positive addition to the course for many students.

**Background**

Learning assistants are peer tutors trained to assist students in the learning process. Whereas teaching assistants aid the instructor with teaching the course materials, the learning assistant aids the student in learning the topics. A review of recent literature (see references) contains articles that more commonly use the terms “peer tutor” instead of “learning assistant.” Falchikov (2001) describes the organization of peer tutoring based on three variables: the status of the participants, location of the activity, and the roles undertaken. According to her classification scheme, the learning assistant program at the University of Akron is cross-level peer tutoring, where existing differences between participants form the basis of the relationship. Some differences between the LA and the participant students include special training and previous success in the course being tutored. The LA program at the University of Akron currently has 34 students serving as learning assistants for a wide variety of courses. Peer tutoring has been found beneficial for many subjects and academic levels of students (see references).

Two learning assistants were trained for three weeks during the summer of 2006 and received three hours of credit from University College. A summary of the topics included in each training session is presented in Table 1.

**Table 1. Topics in Learning Assistant Training at the University of Akron**

<table>
<thead>
<tr>
<th>Training module (1 credit each)</th>
<th>Topics Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I</td>
<td>Learning styles</td>
</tr>
<tr>
<td></td>
<td>Teaching techniques for each learning style</td>
</tr>
<tr>
<td>Level II</td>
<td>Effective Q&amp;A techniques</td>
</tr>
<tr>
<td></td>
<td>Diversity awareness</td>
</tr>
<tr>
<td>Level III</td>
<td>Study skill</td>
</tr>
<tr>
<td></td>
<td>Time management</td>
</tr>
</tbody>
</table>

Previous to this, the anatomy & physiology courses did not have either learning assistants or tutors. In order to keep up with topics being covered in class and to make contacts with students, the LAs were required to attend a minimum of one class each week.
In Review – continued from page 9

The beginning of class served as time to announce a study session or to poll the class for a favorable meeting time.

Learning assistants kept track of the students with which they met for one-on-one tutoring or in group study sessions with sign-in sheets. Mean test scores were determined for students who met with the learning assistants prior to a test and for students who did not meet with the learning assistants. Students completed a survey at the end of the semester to assess the frequency of learning assistant assistance and to obtain student comments about their experiences with the program.

Results

Mean student grades for study session attendance with the learning assistant and for students who did not attend study sessions are presented in Table 2.

Table 2. Student grades (%) on exams in A&P I: Allied Health, Fall 2006

<table>
<thead>
<tr>
<th></th>
<th>Attended LA study sessions</th>
<th>Did not attend LA study sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>81</td>
<td>77</td>
</tr>
<tr>
<td>Exam 2</td>
<td>75</td>
<td>71</td>
</tr>
<tr>
<td>Exam 3</td>
<td>82</td>
<td>76</td>
</tr>
<tr>
<td>Exam 4</td>
<td>77</td>
<td>74</td>
</tr>
</tbody>
</table>

Fifty-two percent of the students in the class met with a learning assistant at least one time during the semester, with one to five sessions being the most common number of meeting times (81% of those who attended LA sessions). Most students participating in the program attended the pre-exam review sessions prior to each of the four exams.

Conclusions

Although the results are not statistically significant, learning assistant-led study sessions appear to be beneficial for those taking advantage of the service as indicated by higher exam scores and more A’s and B’s received in the course (data not presented). Students also had fun working with fellow students and with the learning assistants. Learning assistants also reported that they benefited from the experience as well. For example, they reported increased subject knowledge, friendships with students, good feelings from helping others, and developing better teaching skills. There was less participation by students than expected which could be attributed to scheduling conflicts, belief that participation was unnecessary, student preference of studying alone, or a lack of motivation to seek help when it was needed.

References


Choudry I. 2002. Use of reciprocal peer tutoring technique in an environmental control systems course at an undergraduate level. Journal of Construction 7(3).


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EDU-Snippets

Snippet Connections

A column that survives because you, the members, send us your Snippets

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EDU-Snippets is a column designed to let you, the members of HAPS, share your “ways to make sure your students get it.” During these past few years of putting together your ideas into the EDU-Snippets column, we have been continuously amazed at how many teaching and demonstration ideas pop up and are easily transferred from one instructor to another through Snippets. The following Snippets came in when we put out a call for RENAL Snippets. As you will see, however, most of these Snippets are not RENAL at all! But that is one of the great things about HAPS and one of the great things about asking you, the members of HAPS, to send us your ideas. We also think you will find these EDU-Snippets to be practical and easy to adapt to your own teaching situations. As always we have done a bit of editing so that the ideas blend together.

I. The Renal Connection

Sometimes the renal system sounds (or seems to sound) quite ominous to students and teachers alike. There are so many intricacies connected with the renal tubules as well as the blood vessels connected with the entire renal system. We think you will like these Renal Connections. Actually, we think your students will be on edge thinking about these connections!

A. Urine Connection

Kevin Young (Utah State University, kevin.young@usu.edu) started us out with an interesting tidbit.

One tidbit I find interesting with the urinary (renal) system is that urine was historically important in washing wool. “Fullers” were people who prepared the cloth, and one of the things they needed to do was to wash the oils out of the wool because the wool has a lot of lanolin. In Roman times, it was the job of slaves to stand in tubs of stale urine, stepping on the cloth. (I tell my students this was a minimum-wage job in medieval times!). The urea is broken down by bacteria into ammonia, which helps clean the cloth. In Roman times urine was so important to the “fulling” business that it was actually taxed!

B. Testicular Connection

Kevin Young (Utah State University, kevin.young@usu.edu) also sent another great connection! You will need to incorporate this one into your lecture.

The right testicular vein drains directly into the inferior vena cava, but the left testicular vein joins with the left renal vein instead of the inferior vena cava. Varicocele is much more common in the left testicle than the right and is a leading cause of male infertility.

II. The Oxygen / Hemoglobin Connection

Meanwhile, Chet Harbut (Cerritos Community College, charbut@cerritos.edu) thought we might like to include a nice demonstration on how oxygen binds to hemoglobin. We all know how tough this one is for some students.

Here is a little demonstration that I do when discussing how the binding of oxygen to hemoglobin keeps the partial pressure of oxygen in the plasma low so that, of course, there is a constant partial pressure differential between the plasma and the alveolus.

1. I say that the top of the desk at which I lecture represents plasma.
2. I open a desk drawer and designate it as hemoglobin.
3. I bring in a sack of pennies which I designate as oxygen molecules.
4. I grab a handful of pennies and designate my hand as an alveolus.
5. I start to drop the pennies one or two at a time onto the desk while immediately sliding them into the open drawer (Hb) with my other hand. (Or I actually throw them onto the desk in such a way that they slide into the drawer).
6. As I continue to do this I keep asking how much oxygen (pennies) are in the plasma (desk top). I will let one or two start to accumulate as the number of pennies in my hand (alveolus) decreases.
7. As I continue to do this I keep asking how much oxygen (pennies) are in the plasma (desk top). I will let one or two start to accumulate as the number of pennies in my hand (alveolus) decreases.
8. The students see that the number of pennies (oxygen) in the alveolus (right hand) is now the same as the number of pennies ON the desktop (plasma) so that equilibrium of partial pressures has been achieved.
9. But I also then show them how many oxygen molecules have accumulated in the hemoglobin (desk drawer) and that these did not influence the partial pressure of the plasma.
10. I then also demonstrate the same principle WITHOUT the drawer (hemoglobin).
The students begin to understand the role of hemoglobin in oxygen transport. They also begin to understand the principle of partial pressures and the equilibrium involved in achieving and maintaining partial pressure.

III. The Protein / Rope Connection

And as we were contemplating the hemoglobin, across our cyber-desk came a very interesting way to teach the denaturing of proteins. Bill Karkow (University of Dubuque, wkarkow@dbq.edu) sent us the following.

I like to demonstrate protein denaturation with a rope. Here is what I do.

1. Before class, I take a 1/2” diameter soft nylon rope about 20 feet long and crochet slip knots in it by making a loop, reaching through the loop to pull the rope beyond, back through the first loop to make a second loop, reaching through the second loop to pull the rope beyond, back through the second loop to make a third loop, etc, until the entire length has been shortened into interlocking loops with short free ends.

2. Taking care not to let the shortened crocheted rope unravel, I treat it as a thicker rope, and crochet slip knots in this first “rope” to make an even thicker and shorter second “rope”. By the time I am finished, I have a rat’s nest of rope that will completely unravel upon pulling the ends.

3. I mound the looped nest into a globular shape, taking care to keep the ends out just enough so as not to actually tie a true knot in the rope by mistake. I pull it apart once for practice and redo steps 1 to 3. It should completely unravel without knots.

4. I find 3 or 4 strands in the matted nest that are close to each other as examples of amino acid residues in the active site of an enzyme. I wrap a circle of differently colored label tape around each strand.

5. In class, I show the nest of rope, explaining to the students that this knotted mass is similar to a protein in its folded configuration ready to function as an enzyme. I point out the similarity between the colored sections of rope and amino acids at the active site. You can use a small ball if desired to serve as a substrate by nestling it into the active site.

6. Then with a student holding one free end of the rope, I pull on the other end to totally unravel the rope out to its full length, and point out how the colored sections of amino acids are now far apart from each other – the active site has been destroyed. I warn the class to pay attention right before I pull, since this is like a magic trick – once it is pulled out to full length, I will never be able to assemble the coiled sections right next to each other again. This gives students the “shock and awe” of a magic trick, and demonstrates how denaturation destroys enzyme function. The actual class demonstration takes less than one minute since all you have to do is show, explain, and pull. Cheap too! It is even cheaper if you use a smaller diameter rope, but then it becomes hard to see from the back of the room.
IV. And We Hope You Will....

Keep those cards and letters coming! We thank you all for your EDU-Snippet contributions. For the next issue of the \textit{HAPS-Educator}, send your EDU-Snippet experiences and ideas to rfaircloth@aacc.edu as soon as possible. You will also find a reminder on the HAPS-L list. Plan ahead. You can even submit your ideas now and maybe next issue you too will see your EDU-Snippet in print!
Students as Experts

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I teach a one-semester, model and computer dissection, four hour credit, combined Anatomy and Physiology, lecture / lab type course. I allow students to sit anywhere in lab and create their own working groups. Like most lab instructions we give, I encourage students to work with at least one other student as partners in their lab experience. And like most “recommendations” we give, students often do not comply. So, I “force” them to do so with the following technique. It is not uncommon that the same questions about lab material are asked multiple times during a given lab period. I always address them the first time they are asked of course. Once I have interacted with a group of students to address their question, I always end with, “does that make sense?” The next time I am asked that same question or one closely related to it by another student group in that lab, I will enlist the help of the original group by referring to them as the experts on that question. The two groups get together quickly and I eavesdrop on the interaction just to make sure the information exchanged is accurate. This technique takes no more time than if I answered the question again myself for the second group. The added payoff is that it also allows the first group to reinforce their understanding of the material (“does that make sense?”) if they can “teach” it to someone else. This also “forces” student interactions that might not otherwise have occurred that day. Students take pride in being able to “tutor” their lab peers as “experts”, and I see that groups actually compete to know the information first so that they can then be the “experts” on future questions.

Another way that I involve students directly in their lab experience is to allow them to compose and administer the last two of four lab quizzes each semester. They work from the same databank of structures I do when I compose the first two quizzes. I take turns at one question per student as we go around the room. Each student picks up a lab model and asks the others to identify a structure on it that they selected. The students like this format much better than when I give the quizzes and it takes no more time than my first two instructor administered quizzes. They do tend to pick the easier structures from our database of items, but by the second half of the semester when these last two quizzes occur, the “less dedicated” students have left the class. The total contribution of these student administered quizzes to the overall lab grade is only 11%. The benefits of student desirability and enthusiasm for this mechanism in my opinion far outweigh any academic challenge someone may raise as an issue.

See One, Learn One, Teach One

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Anatomy and other morphology labs often seem dull to students, because of the sedentary, physically-inactive nature of their typical learning exercises. Observational exercises such as dissecting and looking through microscopes tend to be low-energy, quiet activities, as compared to the hustle-bustle of more experimental biology labs, where students might be moving about, boiling test tubes, centrifuging samples, or mixing reagents. I have found that introducing some physical activity into morphology labs helps the students to remain attentive and engaged. One of my strategies is a type of activity known as “see one, learn one, and teach one.”
Teaching Tips - continued from page 14

This activity grew out of a desire to ensure that all students in my lab would look at certain lab specimens that represent important concepts, but that I knew from experience were often overlooked (and missed on exams) by the students. In my earlier years of teaching I would attempt during each lab to emphasize verbally to the entire class those items that were especially important. However, one day when I was unable to speak loudly (because of laryngitis!), I had the idea of going to just one lab table (four students), showing and explaining a key specimen to that group, and then asking them to (1) study it together and then (2) show and explain the item to the other tables (groups) of students in the lab. As I watched the students follow these instructions, I was amazed to see that they became animated about understanding the specimen and even more so about walking around to bring and explain it to the other groups. By the time they were finished, it seemed clear that the group that did the explaining knew this particular specimen very well, and the entire class knew that it was a structure that was important to study.

Based on this experience, in subsequent labs I took this approach a step further, and involved the entire class in “seeing, learning, teaching.” The approach works as follows. Suppose that the topic for the lab is to study cell organelles. I will provide all the students with a collection of electron micrographs and a study guide to go along with them. Students will be asked to work in groups (in our lab, a group would be four students seated at a lab table) and to follow these study guides. However, as the lab goes on, I will select four or five especially difficult but important topics, and pull the relevant micrographs out of the general collection. I will take one of these micrographs (e.g., a lysosome showing autophagy) over to one group, show it to them, and explain the key features and why this micrograph is important. I will ask them to study the micrograph as a group until they feel they understand it and then to “visit” all the other tables to show the micrograph and explain what it shows. Meanwhile, I will select another important micrograph (e.g., nucleolar genes) and take it to a second group of students, showing it to them, and then asking them to learn it and then to go “teach” it to the other groups. I select other items for the remaining groups of students. Over the course of the next half hour, the lab can get a bit chaotic, with most of the students talking to each other, first at their own table and then walking about to bring their “lesson” to the other tables. However, it is rewarding to hear so much animated discussion – about biology – instead of the too-quiet, sleep-inducing atmosphere that sometimes pervades a lab where students are working in isolation.

This “see one, learn one, teach one” approach could be used for studies of bones, muscles, and most histological or anatomical structures. Advantages to the approach are:

- Students get the message that these 4 or 5 featured topics are important to study; they are more likely to remember these topics because of having learned them from their peers.
- The necessity of verbalizing information, both within and between groups helps to reinforce use of relevant terminology.
- The physical activity of walking from group to group helps to “wake up” students who might otherwise tend to nod off or lose focus during the more sedentary lab exercises.

♦

It's pronounced "HAPS eye"

LOOK OUT for our NEW courses!

Short graduate biology courses in flexible formats for A&P professors

HAPS Institute
Want to know more about it? Read our column in this issue and visit us at hapsweb.org

Teaching Tips continued on page 16
Most of my nursing students will never do a differential white blood cell count on the job, but I would like them to know how counts can be used to diagnose infections. I’d like them to suspect bacteria if the neutrophils are high, viruses if lymphocytes are high, parasitic worms if eosinophils are high (though allergy is a possibility too), and AIDS if lymphocytes are low. It would be nice if they knew that high band counts suggest acute bacterial infection. Bands are replacement neutrophils just entering circulation. Their nuclei are band-shaped unlike the segmented nuclei of mature neutrophils, or “segs”. I would be pleased if they knew that atypical lymphocytes are an important indicator of infectious mononucleosis. These cells are transformed T lymphocytes responding to B lymphocytes which are infected with Epstein-Barr virus. Atypical lymphocytes are irregularly shaped because the cytoplasm is frequently indented by the surrounding red blood cells.

Unfortunately, doing differential white blood cell counts from real blood smears has not been helpful. Many of my students are unskilled with microscopes. Our prepared blood slides vary a lot in quality. Worst of all, our blood slides are of normal blood and do not show signs of infection. After one particularly frustrating lab, it occurred to me that collages of blood cells printed in color might be the answer. Students could look at printed pictures instead of microscopes, and different infections could be represented by varying the ratios of white blood cell types. I used a Leica digital microscope camera to photograph hundreds of white blood cells from our slide collection and Photoshop to enhance color uniformity. I tiled WBC images into Word pages using the Insert Picture function. Fifty WBCs fitted into a page. A complete simulation with 100 WBCs took two pages. The results looked like mosaics, but white blood cells were clear and easy to see. I made simulated blood smears for a normal patient (Figure 1.), a patient with worms, a patient with acute appendicitis, a patient with mononucleosis, and a patient with AIDS and labeled them “Patient 1”, “Patient 2”, “Patient 3”, etc, and printed sets on a color printer. I would display them electronically instead of printing them if my lab had computers. I also printed directions for students including a pictorial key for identifying white blood cells, a list of possible conditions for the patients, what the expected WBC percentages were for each condition, and a results sheet. I asked students not to write on the simulations so I could reuse them.

Students worked in small groups. Their task was to tally WBCs, calculate WBC percentages and make diagnoses. Calculating WBC percentages was easy because the students tallied one-hundred WBCs. The tally was the percentage. I could have done a briefer exercise by asking students to tally just the fifty WBCs on one page and then double them. The results would have been the same. I also could have asked students to be more ambitious and calculate WBC counts as well as percentages. Counts can be calculated by multiplying WBC percentages times the patient’s total WBC count. For example, 35% lymphocytes times 9000 WBCs per cubic millimeter (the total WBC count) yields a lymphocyte count of 3150 per cubic millimeter. Of course, for simulated patients, total WBC counts are fictional. Total WBC counts range from roughly 6000 to 10,000 per cubic millimeter. Had I included counts in the exercise, I would have picked a count on the high end for the appendicitis patient, a count on the low end for the AIDS patient, and mid-range counts for the others. I was hesitant to ask my students to do these calculations because I did not have calculators for them to use.

So, how did it go? There was obviously less frustration and the lab took less time. I hope learning improved, but that is harder to assess. You can see one of the simulations in color by going to the HAPS wiki site. If you would like to use these simulations in your classes, please e-mail me and I will send them to you as attachments. Please specify your choice of letter or legal size. Letter size is quite legible and less expensive to print, but legal size is easier to see if several students are sharing them. Please also specify docx or pdf format for the simulations. Docx files can be modified and individual WBC images can be selected and saved, but gaps may show up between tiled pictures as docx files pass from one computer to another. On the other hand, pdf files are more stable but cannot be modified and require Adobe Acrobat to open. I will also send WBC numbers and percentages for each “patient” plus exercise directions. You are welcome to use these resources without attribution or prior approval from me.
“HAPS Safety Committee Survey Said…”

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Do you have a physically-challenged and/or a pregnant student in your Human Anatomy and Physiology laboratory? Are body fluids involved in your experimental designs? Have you been worried about the safety of your students due to overcrowding in the laboratory?

In an attempt to determine how the Safety Committee might better serve the HAPS body, the committee proposed a survey, and, upon approval of the Board of Directors at the last mid-winter meeting in January 2008, the survey was conducted at the HAPS meeting in New Orleans this past May (2008). The survey consisted of the following questions:

1. Using a scale of 1-10 (1=least, 10=large concern), arrange the following safety issues as they pertain to your Human Anatomy and (A & P) Laboratory instruction. If possible, describe such safety issues.
   
   ___ student with special needs
   ___ use of experimental subjects
   ___ body fluids
   ___ storage of chemicals
   ___ dissection
   ___ instruments and equipment
   ___ class size and laboratory space
   ___ safety and distance learning
   ___ legal issues
   ___ other

2. Have you used (e.g., downloaded) the HAPS Safety Guidelines as a resource to solve A & P laboratory safety problem(s)?

3. What laboratory safety issue problem would you need to be included in the HAPS Safety Guidelines?

Thank you to all of the HAPSters (n=42) who took the time to participate either through completion of the survey forms distributed in New Orleans or through listserv communication. Fifty percent of the participants teach at 2-year institutions while the other 50% teach at 4-year institutions. Based on the ranking, responses to the first question ranged between 4 and 5.9 for each laboratory safety issue. This may indicate that no one issue is more important than others; however, this may not necessarily be true for specific institutions depending on their respective laboratory setting needs.

Forty-five percent of the participants indicated that they have used the HAPS Safety Guidelines. To our dismay, a larger fraction (55%) has not used the guidelines in any way. Respondents were concerned about laboratory safety issues such as: disposal and storage (VI A-I1), class overcrowding and insufficient instrumentation (XI A, B, C), teaching by adjunct faculty, vision problems and body fluid labs (HIV and hepatitis testing) (V B&E), use of wheel chair in the laboratory (III B, C, D), fumes/ventilation/chemical exposures especially for the pregnant (III A), class size and instructor to student ratio (III D, IX A, B, C), legal issues (XI), use of live specimens and anesthesia (IV B), food/drink protocols (IV A), and dissection with unsteady hands/long finger nails (II, VII). Although some concerns were not directly related to laboratory safety, it is noteworthy to name them: testing for disability issues, Navajo cultural taboos, theft of backpacks in the hallway. As such, these are important to address as well. While most of the concerns are already addressed in the HAPS Safety Guidelines, some may have been addressed by the Cadaver Use Committee or the Animal Care and Use Committee.

Unfortunately, there was no way to indicate whether respondents were new members or not due to the limitation of the survey questions. Regardless, this is a way to reiterate the significance of Human Anatomy & Physiology laboratory safety, and to encourage everyone to check out a helpful resource, the HAPS Safety Guidelines, which are posted in the members section of the HAPS webpage, wwwhapsweb.org.

Thanks to all current and past members who helped in the development, updating, and promotion in the use of the HAPS Safety Guidelines.

The Safety Committee, 2001 - 2008

Friends of the Committee
Melaney Cook, Donald Kelly, Paul Krieger
The HAPS Public Affairs Office (or PAO) does some interesting things. We would like to tell you about them and encourage a group of HAPSters to share in the fun. Currently the basic jobs of the PAO are: 1) keeping the membership up-to-date on scientific, technical, and legal issues related to the teaching of anatomy and physiology; 2) raising public awareness of HAPS; and 3) publicizing conferences and other HAPS-related activities.

I. Updates
Each working day, your HAPS PAO places links to articles about science, technology, education, and individual members on the PAO homepage (http://wwwhapsweb.org/displaycommon.cfm?an=1&subarticlenbr=190). Each week a summary is provided on the HAPS listserv. Recent scientific information has included new developments in cardiology, diabetes, and cancer, to name a few items. The hope is that the membership can update their own knowledge and keep their students abreast of current developments. We also include technological advancements, particularly in the area of medical imaging. Some of the newest techniques are producing stunning photographs which I use in my own anatomy and physiology lectures. The biggest challenge is finding these links for you in the first place. Therefore, every week I scan around 10-20 specialized scientific and technical news services for useful websites. Additionally, I use a few regular news services.

The United States Department of Education is a source of information about accreditation developments, an area of great concern for HAPSters. There are continuing educational challenges all across the globe which may impact anatomy and physiology professors. Among the more well-known of these are issues related to the teaching of evolution and the use of live animals in physiology. Periodically legal problems arise of which the membership should be aware. For example: is a professor allowed to require polite displays on students’ t-shirts? Answer: sometimes it is required! What are the new ways to cheat? Did you hear about the soda can cheater? You would have if you were a faithful reader of the PAO Homepage. I develop this kind of information from five different educational news services.

Some of our members have made outstanding achievements (teaching awards, books) and we put this information on a part of the PAO site too. We need to hear from you if you are in that category so that we can recognize you too!

II. Public awareness of HAPS
From time to time HAPS receives requests for speakers to talk with local and national media; we try to accommodate these requests. The PAO also recognizes that our annual meetings are one of the best ways to raise public awareness of our organization. Not only will local universities cooperate, sometimes, in getting our message out, but the local media always seem to have an interest in our speakers. For example, at our San Diego conference, the most powerful (wattage-wise) radio station in Southern California had a story about our speakers. In addition, local TV, community websites, and high-distribution daily newspapers often carry stories about HAPS. This work begins months before the event. We are currently (early January) working on the press release for the Baltimore Annual Conference.

If you are doing anything that you would like the general public to know about, contact us and we will try to get it out to the media. Here is an example: if you are doing anything with forensics, let the local police officers’ association know about it or we can try getting their professional organizations to be aware of it. Our president, Kevin Petti, had a very successful bit of local publicity when he and his class memorialized their cadaver with a tree and monument on his campus! Perhaps you might do something similar and, if you do, please mention your HAPS membership.

III. Publicizing conferences and other HAPS-related activities
In advance of Regional and Annual Conferences, we provide information to school districts and colleges. This activity involves developing lists of groups and then contacting dozens of individuals and organizations within a one- or two-month period before our event. For the New Orleans conference, just finding addresses for all of the colleges, determining if they had professors teaching anatomy and physiology, and then contacting at least every department (sometimes every professor and high school biology teacher) became a huge endeavor. I never seem to be able to find everyone who might be interested in hearing about us within driving distance of a conference so we need lots of local help on this. The PAO was working to publicize HAPS-Institute too. However, Professor Patton is doing such a great job that the Institute seems to have “legs” of its own!

Finally, we hope that you will find at least one portion of this interesting enough so that you will volunteer to join us—just e-mail me at: devans@pct.edu. Hope to hear from you soon!
The Grants and Scholarships Committee is pleased to announce the following awards and scholarships. The Adjunct Grant was awarded to Heidi Bustamante. Robert B. Anthony Scholarships were awarded to Tony Chennault, William Karkow, Karen Keller, Thomas Keenan, Courtney Leik, Sarah Lovern, Howard Motoike, and David Thorp. The recipients of the very first HAPS-I scholarships are Meg Flemming and Carrie Meyer. The HAPS-I scholarship is funded through a generous donation by Morton Publishing. Congratulations to these HAPS members!
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ANIMAL USE
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Distributing the HAPS policy statement, developing animal use Internet links on the HAPS Home Page, monitoring relevant legislation, and creating a resource packet for HAPS members.

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