Hemoglobin Molecule

RBC's

O=C=O

CO₂

O=O

O₂

Glucose

H – C – O
H – C – OH
H – C – OH
H – C – OH
CH₂OH
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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 $50 for full time faculty, and $35 for part time and retired faculty. Annual membership renewals shall be due on January 1, April 1, July 1, or October 1. New members shall renew on whichever date most closely follows the date of their initial membership. HAPS Hotline: (800) 448-HAPS (4277). Information on membership, meetings, and more! Send correspondence to: HAPS, 8816 Manchester, Suite 314, St. Louis, MO 63144. Check out our new webpage at: http://www.hapsweb.org/

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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 an e-mail attachment as a Microsoft Word or Word Perfect file, 3.5” double density disks, or CD-Rom—please include a hard copy as a backup. If references are included, please follow the methods suggested in Scientific Style and Format: The CBE Manual for Authors, Editors, and Publishers. 6th Edition, Style Manual Committee (Council of Biology Editors) Cambridge, Cambridge University Press. 1994.

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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: Susan Baxley, Troy University Montgomery Campus, College of Arts & Sciences, P.O. Drawer 4419, Montgomery, AL 36103-4419, (334) 241-5473, (334) 241-8665 fax. sbaxley@troy.edu
Serving as your President this past year has been a most rewarding and significant professional growth experience for me, and I want to first thank the members of HAPS for giving me this opportunity. I also want to thank the quality line-up of Past Presidents who set the standard to which a HAPS President must rise. It has been a very exciting year, challenging at times, downright fun at times, overwhelming now and then, but overall a very positive experience.

The many things we accomplished this year would not have been possible without the hard-working Board of Directors you chose to lead our organization. I want to thank Phil Tate, outgoing Past President, for all of his work on behalf of HAPS these past three years. Phil’s sincere dedication to HAPS has been of great value to the organization. President-Elect, Ric Martini, has stepped right up and taken charge of the Nominations and Partner’s Association Committees and our international outreach efforts. We are very fortunate to have someone as talented as Ric ready to take the reins on July 1st. Treasurer, Gail Jenkins, has been so incredibly dedicated to HAPS, dependable, hard working, and truly an inspiration to all of us. Thanks Gail, for keeping me sane this year. Our Secretary, Roberta Meehan, has been a huge help to me this past year and I want to thank Roberta for all of the work she has done to keep us “recorded.” Our Regional Directors have all been major contributors to the many decisions we made this past year. I want to thank Elizabeth Becker, Mary Bracken, Christine Eckel, and Rich Faircloth for their great ideas, dedication to our mission, willingness to share their opinions, and working together for the good of our organization.

Your HAPS Board of Directors officially meets face-to-face twice a year. We meet just before and/or during the Annual Conference in May/June and again in January at our mid-winter meeting. However, there is a significant amount of business that occurs in between the two face-to-face meetings. One of my goals for this year was to establish an electronic-meeting schedule which would enable us to take care of business without our officers being expected to be available for HAPS business 24/7 all year long. My plan, I thought, was simple. We would meet once a month, electronically, from Monday through Friday. I established a regular monthly e-meeting schedule in July 2004, and the Board of Directors agreed to some basic e-meeting guidelines. While we did get a lot of work done during e-meetings, it was not without some communication problems and challenges tracking the progress of specific issues. However, in the good-faith effort typically demonstrated by HAPS members, no one gave up and we continued to work through the many issues facing the Board of Directors. We ended up modifying our e-meeting guidelines in January 2005, and, with the help of Carl Shuster (our “web guru”), we have established a specific area on the web site for Board members to discuss issues before official meetings take place. I am confident that we made significant progress toward establishing a way for the Board to officially meet on a regular basis, using electronic means, rather than expensive monthly conference calls or having our Board on-line or on-call constantly.

By far, our most significant accomplishment this year has been the selection and implementation of a new web site company and establishment of a new web site. As you know, Affiniscape was ultimately chosen as our new web site company, and we have been very pleased with our decision. Our web site, www.hapsweb.org, is awesome, and we owe a huge debt of gratitude to Carl Shuster for all the work he has done to make it work so well for HAPS. He has given so generously of his time and talents. He is right on top of every little request we make, quick to fix problems, so pleasant to work with, so patient with us, and so humble. Remember, he has a paid teaching job just like the rest of us! Carl, on behalf of HAPS, I want to say a most sincere “thank you.”

The “guts” of HAPS is found in our committees and all of the work they do. To all of our Committee Chairs, your work has been stellar this year, and all you do for HAPS is so very much appreciated. Thanks also to all of you serving on HAPS committees. This is where HAPS really makes a difference in the classroom, in programs, for faculty, and, consequently, for students. If you have not joined a committee, check out the list inside the back cover of this publication. Get involved in one of our many committees. You will find great reward in sharing your ideas and will develop a passion toward issues facing the committee of your choosing. Maybe you will even consider chairing a committee in the future!

The highlight of our “HAPS year” is always the Annual Conference, which usually falls sometime between Memorial Day weekend and mid June. I have heard the Annual HAPS Conference referred to as “the friendliest conference I’ve ever attended,” “the most relevant conference for A&P instructors,” “a conference I do not ever want to miss,” “the learning and teaching opportunity conference,” and the list goes on and on. This year our Annual Conference was held in St. Louis, Missouri May 28-June 2. It was
Greetings - continued from page 3

co-sponsored by the St. Louis College of Pharmacy and HAPS and coordinated by Margaret Weck. It was a grand conference. Margaret had great speakers, a large variety of quality workshops, and of course, our traditional receptions, breakfasts, banquet, meetings, fun social and networking activities, and touring options. As usual we had tremendous vendor support for our conference and there was plenty of opportunity to spend “quality time” in our exhibition hall. Thanks to Donna White for her very successful year as Marketing Manager!

The 2006 Annual HAPS Conference will be held in Austin, Texas. Mary Lou Percy is the 2006 Conference Coordinator. You will be able to obtain information on the 2006 Conference on our web site. Since the 2006 is the 20th Anniversary of HAPS Annual Conferences, we will be having special “Anniversary/Reunion” activities next year.

Again, I want to thank Izak Paul and his team for an outstanding Annual Conference in 2004 in Calgary. The Calgary conference was extremely successful in learning opportunities as well as financially!

A special thanks to our Business Manager, Tonya Ferguson, from HAPS Headquarters in St. Louis. Tonya is a skilled professional in organizational management, and her assistance to the Board and to Annual Conference Coordinators has been extremely valuable. It has been a pleasure to work with her this year. We are so very fortunate to have such great people working on behalf of our beloved organization.

I also want to thank the following Pierce College Administrators for supporting me during my tenure as HAPS President: Chancellor, Steve Wall; Dr. Michele Johnson, President, Pierce College, Fort Steilacoom; Mary Chikwinya, Vice President, Pierce College, Puyallup; and Mike Lamka, Chair, Natural and Social Sciences Division. Your support of professional development opportunities for faculty is sincerely appreciated.

Finally, I want to thank my husband, Karl, for his patience and encouragement during the many hours I spent with my home computer instead of with him. And, of course, thanks to my very special kids, Kimberly, Erin, and Evan, who were unbelievably understanding during the year.

HAPS is financially sound, our membership is growing, we are reaching out to the international A&P community, expanding relationships with other professional organizations, and reaching a new level of sophistication as a professional society. Opportunities abound throughout our organization and the field of anatomy and physiology education. Where we go in the future really depends on you. Think about where you might serve HAPS. While I still have one more year to serve on the Executive Committee, I am already thinking about where my place in HAPS may be in the future. Get ready Curriculum and Instruction Committee, I am planning to join you! Thanks to all of the members of HAPS for your support of a great organization of “people passionate toward teaching A&P” (known as HAPSters).

Proposal for a Regional Conference

Send copy to:
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Please supply the following information on separate sheets of paper:
• Outline of proposed budget (see budget section of Guide for Coordinators of HAPS Local Conferences)
• Written statement of administrative support/approval from the host institution agreeing to co-sponsor the HAPS Regional Conference and to allow use of its facilities
• Request for seed money, if needed (see HAPS support in Guide)
• List of 3-digit zip codes (first 3 digits) for areas to be included in mailings (usually not more than a 250-mile radius)
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Austin Welcomes You!
Historic Sites

Texas State Capitol

Standing 14 feet taller than the U.S. Capitol, the Capitol building gives meaning to the phrase “Everything is bigger in Texas.”

Governor’s Mansion

Texas’ premier historic home has served as the official residence of Texas governors and their families since 1856. It is the fourth oldest governor’s mansion continuously occupied in the United States.

Texas State History Museum

The Bob Bullock Texas State History Museum, which is named after one of Texas’ finest Lt. Governor’s, is a dynamic educational institution that engages visitors in the exciting story of Texas through a variety of program and exhibit experiences.

Lady Bird Johnson Wildflower Center

The Lady Bird Johnson Wildflower Center was founded in 1982 as a non-profit educational organization with Austin, Texas as its headquarters. The purpose of the Lady Bird Johnson Wildflower Center is to educate people about the environmental necessity, economic value, and natural beauty of native plants.

LBJ Library

The largest of the nation’s presidential libraries, the LBJ Library houses papers and memorabilia of Lyndon Baines Johnson, the 36th U.S. president.
Cultural and Recreational Sites

Mount Bonnell
Climb the 99 steps and savor a violet-tinged sunset over Lake Austin and Westlake Hills from the most scenic and one of the highest points in the city limits (785 feet above sea level). Open daily, dawn until dusk.

Paramount Theatre
On October 11, 1915, the Paramount Theatre opened its doors to the public in what would become a legacy of the theatrical service to Austin and its surrounding communities.

University of Texas at Austin
Home to over 50,000 students, UT has become the largest University in the United States.

South Congress Avenue
From the revamped San Jose Motel to the SoCo shopping center and the stylish salon to the stars, Wet, the neighborhood with the once sketchy past, is THE place to eat, shop and while away the day.

Austin City Limits
Austin City Limits started its 29th year on Oct. 11. It’s still America’s favorite place to see roots of music from blues to rock and swing to country.

For nearly four decades, the Austin Museum of Art has become an essential component of the artistic and social fabric of the city of Austin.
Entertainment Districts

Warehouse Entertainment District

Centered around West 4th and Colorado Streets, the Warehouse District boasts many fabulous restaurants, several excellent microbreweries, old fashioned pubs, coffee houses, and martini and cigar bars. Jazz and blues are the predominate music of the district, with Antone’s being a prime example.

6th Street Entertainment District

Austin’s most popular historic district has to be 6th Street. A National Register District, East 6th Street is still home to 7 blocks of historic buildings, including the Driskill Hotel. By day, it is a hodge podge of antique shops, quaint eateries, and small boutiques, and it is the location of the biannual Old Pecan Street Festival. By night, 6th Street comes alive with music. 124 nightclubs can be found in the 6th Street area, all within easy walking distance of one another.
EDU-Snippets is a column designed to let you, the members of HAPS, share your personal or institutional educational experiences. So, here are this edition’s contributions! You may notice that we have only two contributions this time. However, we think you will find both ideas to be a memorable addition to your EDU-Snippet file. Our theme is “form and function” and we think everyone will see how these two ideas fit right in!!

For the sake of column continuity, we have done a bit of editing. We have also avoided quotation marks (except in-text). However, we think everyone will be able to tell where our introductions and commentaries end and where our contributors’ words begin.

I. Histology Charades

Debra Bartlett (Anne Arundel Community College, docbartlett@comcast.net) sent us the following suggestion for impacting the form and function of histology.

My anatomy & physiology students were preparing for their histology practical. I decided to give them a practice practical by putting up some slides on the video projector at the end of the class. To help prepare them for what the actual examination would be like, I selected slides at random and asked a question about the tissue. Questions were such things as: “Name the fiber present on this slide;” “Name the cell present;” “What is the cell shape?” etc. The quiz was ten questions and was not going to count for a grade.

I had instructed the students throughout the teaching section to develop a mental checklist as they were learning the tissues. I told them that they could not learn tissues by memorizing what color they were or some such thing, but that they had to understand points about the tissues. These hints would lead them to the correct answer. However, they could not grasp this concept.

I graded the quiz and discovered that one class average was 28% and the other class average was 30%. Obviously, they were not ready for their examination, so I decided to cancel the scheduled test and to take a different histological approach. I developed a game to help them strengthen their mental checklist approach. This game would become their guide to lead them to the correct conclusions when discerning the tissues.

I started the game by sitting at the front of the class and saying, “I am thinking of a tissue. You ask me questions until you are certain what tissue it is.” I encouraged them to shout out questions, and for everyone to take note of both the questions and the answers.

The first tissue probably elicited 25 to 30 questions as the students wildly shouted out questions, randomly trying to guess the tissue. Each time I would comment that such a question is not valid because of something about a previous answer. Finally, they decided that there were no more questions to ask, and when I asked, “What is the tissue that I am thinking about?” They all responded with the correct answer.

The second round went much more smoothly. I prompted by saying, “What has to be the first question?” Finally they understood that the first question had to be, “Where is it located?” They continued to hone their questions and within 5 or 6 questions, they knew the answer. As we continued playing this game, they grew more and more confident in their abilities. After doing approximately ten tissues, they were feeling pretty good, and their knowledge seemed to be in tune with reality.

One student said that this was easy now, BUT, when they try to actually look at a tissue slide through the microscope, they would still be confused. At that point I went back to the video projector and projected a tissue onto the screen. I said, “We have the same checklist of questions but now I do not have to answer. You can see the answer for yourself.” They asked the questions, I pointed out the answers by pointing to the area on the slide. Again, their confidence grew. And their confidence continued to grow as we progressed through more tissue slides.

The next class was their examination. The class average for one class went from 28% to 71%, and for the other class from 30% to 79%.

This was quite a remarkable transformation and it was definitely well worth the extra time required for changing the class schedule. Students felt that they indeed had learned about the tissues and not that they had memorized enough slides and colors to get through the exam.

II. Neon Liver

Patricia Bowne (Alverno College, pat.bowne@alverno.edu) sent us a great idea for helping students understand the form and function of the liver. Pat calls this idea “Neon Liver,” but she does explain that the “neon” part is because she likes her teaching aids to be garish. Here is how she does it.
I give each group of students:

1 neon pink pipe cleaner to represent a branch of the hepatic artery
1 neon blue pipe cleaner to represent a branch of the hepatic portal vein
1 purple pipe cleaner to represent a hepatic sinusoid
6-10 small post-it notes to represent hepatocytes
2 neon green or yellow pipe cleaners to represent bile canaliculi

I instruct the students to connect the pink and blue pipe cleaners to the purple one to show how blood from both the artery and vein mix in the sinusoid. They should then bend the sinusoid at right angles to the artery and vein and tape it down the middle of a piece of notebook paper so the artery and vein stand up in the air.

Along each side of the sinusoid, the students should lay down a row of post-it notes to represent the hepatocytes. I have the students look up the functions of the hepatocytes and write them on these post-it notes.

In discussing the functions, I start with bile production. At this point, I have the students lay the yellow or green pipe cleaners along the post-it notes to show how the bile canaliculi carry bile back towards the hepatic artery and portal vein. They should twist the two-green/yellow pipe cleaners together at the end of the paper to show how they join to carry bile out of the liver.

Each group should now have the hepatic triad (artery, vein, and hepatic duct) at one end of the notebook paper and a sinusoid sticking out of the other end. To show how the liver lobules are formed, I have them lay their papers out on a table like the petals of a daisy, with the sinusoids meeting in the center. They then attach the sinusoids to a blue pipe cleaner, which represents a branch of the hepatic vein, returning the filtered blood to the heart.

I use simple PowerPoint™ slides to guide students through this. I will provide these slides to anyone who requests them.

III. And We Hope You Will....

Keep those cards and letters coming! We thank you all for your EDU-Snippet contributions. The next deadline is August 1, 2005. Plan ahead so you can get an idea to us in time for us to meet our deadline. Then you too will see your EDU-Snippet in print!
Flavor - continued from page 11
evidence of awareness; such people may indicate yes or no responses even if the responses are not accurate. Coma is the most widely known state of impaired unconsciousness and is a state of profound unconsciousness caused by disease, injury, or poison. Persons in a coma are unresponsive and their eyes are closed. A brain dead person has no activity anywhere in the brain. Although the thinking part of the brain (cerebral cortex) and/or parts of the diencephalon (thalamus) are no longer functional in a person in a persistent vegetative state, certain regions of the brain (brain stem, where autonomic functions such as breathing and the beating of the heart occur) are still functional.

The determination of brain death, a very significant clinical diagnosis, can have a devastating effect on the patient and the patient’s family. Brain death is defined as the irreversible loss of all functions of the brain including the brain stem. Standards for making a diagnosis of brain death require identification of the suspected cause of the coma, determination that the coma is irreversible, performance of a clinical examination, and interpretation of appropriate neurodiagnostic and laboratory tests.

The determination of brain death can occur in several ways. According to Wijdicks, a neurodiagnostic test such as computed tomographic scan can identify the cause of a patient’s coma, and absence of function of all parts of the brain can be determined by clinical assessment (no movement, no response to stimulation, no breathing, no brain reflexes). In addition, the absence of electrical activity in the brain, electrocerebral silence, can be determined using an electroencephalogram (EEG), and the absence of blood flow to the brain can be determined by blood flow studies such as a brain scan employing intravenous injection of Tc-99m HMPAO.

The brain death standard was proposed in 1968. A person’s heart can still be beating when the person is brain dead. A person who is declared brain dead is legally dead, and in most states, two physicians must declare a person brain dead before organ donation can proceed. The ethical question might be: what does one think about brain death as a criterion for death and how does one look at the implications of such a criterion? The medical profession, supported by legal and some ethical consensus, now considers that if a person’s entire brain is dead, the person is dead. The reasoning behind this criterion is that if the entire brain is destroyed and, therefore, nonfunctional, spontaneous breathing is absent and cessation of heartbeat is soon expected to follow. This reasoning is the basis of the fundamental concept that all life support treatments, which the patient may have had in place before brain death has been established, can be removed because the patient is now dead. In addition, the concept provides the opportunity to obtain organs from a brain dead individual that are still in good condition for transplantation.

The death at issue in the brain death debate is not an empirical reality, but a social category, “social death.” Hughes observes that, until recently, both mind and body stopped functioning at the same time so death was seen as one phenomenon. However, whole brain definitions of death in the modern world, according to Hughes, arose as a result of the technological deconstruction of death as a unitary phenomenon. The new technologies have given humanity such powers of intervention on the human body that there is the need for regulation and supervision. Even though more reliable tests are required, currently the diagnosis of brain death is based on both clinical and laboratory findings. Functional neuroimaging should not replace the clinical evaluation of patients with altered states of consciousness, although tests can objectively describe the degree of difference from normal cerebral activity. Hughes argues that new biological and cybernetic technologies will create tremendous material incentives for the living to stop treating the permanently unconscious (neuromortal definition of death) as socially alive (whole body definition of death or “social death”).

According to Stell, “brain death” suggests that there is more than one kind of death (“brain death” and “cardio-respiratory death”), or that there is more than one way to die, or that there are degrees of death. Stell argues that if a patient has been diagnosed as “dead” by medically accepted neurological criteria, it is no longer appropriate to refer to the medical equipment attached as “life support.” The theory of “brain death” invites the unfortunate thought that a patient who has already suffered one sort of death (“brain death”), should be spared the second sort (“cardio-respiratory death”) as long as possible. Stell proposes that hospitals consider removing “brain death” from their policies and replacing it with “determination of death by neurological criteria” as a way of affirming that there is more than one criterion used to diagnose death.

Due to the obvious importance of making an accurate diagnosis of brain death, the significance of this determination cannot be overemphasized. Schiff, Kim, and Maizes assert that the critical question of what the vegetative state patient experiences continues to mystify medical experts, and so the philosophical stance insists that patients be treated as though they are aware of their environment. Although it is not possible to eliminate, through education and more precise language, all confusion and disagreement about death, some families of brain dead patients need to be educated about the physiology of brain death. Even so, some people are uncomfortable with a brain death definition of death since the patient may still have a heart beat, and the legal guardian or family members may wish to wait until there is cessation of heart beat for an extended period, the classical criterion for death. The principles of beneficence and nonmaleficence instruct that actions are morally right insofar as they increase the good and avoid harm. Thus, accepting the brain death definition of death will satisfy both goals by allowing a brain dead patient’s “life-support” to be removed while at the same time giving “closure” to family members.

The pressures and benefits of organ harvesting from an individual who is brain dead should not justify or accelerate accepting the “brain death” definition of death. Although one may lead to the other, the determination of brain death should not become entangled with the arguments for organ transplantation. The need to donate organs should not be a part of the discussion of whether brain death as a standard of death is an acceptable one. It is unethical to end one life in order to provide “parts” for another. Determination of death by neurological means (brain death) is a sound way of arriving at the diagnosis of death, and it should not be diluted by the dual argument for increased needs for donated organs. There is no good done by implying that a person who has suffered one form of death (brain death) has been spared a second form of death (cardio-pulmonary death). All persons have equal worth, and so it is unethical to end the life of a patient who has a chance of getting better through the prudent use of medical devices. However, once a patient is diagnosed as “brain dead,” removing “life support” is not ending life since the person is already dead.

Flavor - continued on page 13
How do you create a classroom atmosphere that is conducive to learning at 8 o’clock in the morning? Since almost all of my eager nursing students arrive ten to fifteen minutes prior to the start of the A&P lecture, I decided to provide information that would immerse the students into A&P even before class started. Several items from the A&P trivia listed below are projected onto the front screen. I tell the students to jot these down (or retrieve them from the course website) and try to comprehend the significance of these points in the context of the organ system we are considering. Furthermore, I tell the students not to memorize these items since they will not be included on exams. I urge them to use the trivial points in conversation with classmates, around the dinner table, or on their next date. If I can get the students to talk about A&P, it is likely that they will come to appreciate the fascinating nature of the information we study.

Skeletal System
- there are about 206 bones in the human body
- bone fractured most often = clavicle
- bone fractured the least = scapula
- most mobile joint = shoulder
- smallest skeletal muscle = stapedius
- strongest joint = hip joint
- longest bone = femur
- smallest bone = stapes
- most prominent vertebra = 7th cervical
- there are usually 12 pairs of ribs (same in men and women)
- one in 20 people has an extra rib
- your arm span is usually equal to your height
- you shrink approximately 12.7 mm during the day due to compression of the intervertebral discs
- shiny white enamel on the teeth is the hardest material in the body
- babies are born without bony kneecaps; they do not ossify until the child reaches 2-6 years of age

Muscular System
- muscle means “little mouse”
- there are about 650 voluntary (skeletal) muscles in the body
- there are 20 muscles located in the hand
- most immobile joint = sutures of skull
- strongest joint = hip joint
- most prominent vertebral = 7th cervical
- there are usually 12 pairs of ribs (same in men and women)
- one in 20 people has an extra rib
- your arm span is usually equal to your height
- you shrink approximately 12.7 mm during the day due to compression of the intervertebral discs
- shiny white enamel on the teeth is the hardest material in the body
- babies are born without bony kneecaps; they do not ossify until the child reaches 2-6 years of age

A&P Starters

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Literature Cited

Flavor - continued from page 13

- largest muscle = gluteus maximus
- strongest muscle = masseter
- smallest motor unit (3 muscle cells) is in external eye muscle
- most active muscle = external eye muscle
- greatest source of body heat = contraction of skeletal muscles
- all body muscles pulling in one direction would develop 25 tons of force
- banging your head against a wall uses 150 calories an hour

Digestive System
- the digestive system is a 9-metre-long tube, open at both ends
- every person has a unique tongue print
- the salivary glands pour 1.5 litres into the digestive system daily
- surface area of small intestine = 60 square metres
- longest section of gut = small intestine = 5 metres
- narrowest part of gut = esophagus
- widest part of gut = stomach
- most acidic substance in body = hydrochloric acid in stomach
- the stomach has to produce a new layer of mucus every two weeks, otherwise it will digest itself
- the stomach can stretch to 50 times its empty size and hold 4 litres
- cells with shortest life span = epithelium of duodenum = 3 days
- greenest substance in the body = bile in the gall bladder
- largest gland in the body = liver
- source of most diverse mixture of digestive enzymes = pancreas
- section of gut with richest blood supply = jejunum of small intestine

Circulation and Blood
- there are about 99,758 km of blood vessels in the body, the equivalent of approximately 2.5 times around the world
- the size of your heart is equal to that of your fist
- the human heart creates enough pressure in the left ventricle to squirt blood 9.1 metres
- most powerful chamber of the heart = left ventricle
- first branch of the aorta = coronary arteries
- capillaries are 1/30th the diameter of a human hair… but all capillaries in the human body, laid end to end = 96,000 km
- it takes one minute for a blood cell to travel through the entire body
- slowest blood flow in the body is through the capillaries
- human heart rate = 100,800 beats/day
- fetal heart starts beating during fourth week of pregnancy
- only artery that carries oxygen-poor blood = pulmonary artery
- lowest blood pressure is in right atrium

Urinary System
- your body is 66% water
- the left kidney is higher than the right
- all the renal tubules laid end to end = 60 metres

- yellow colour of urine caused by pigment derived from bile
- a male’s urethra is five times longer than a female’s
- the most worm-like organ in the body is the ureter

Nervous System
- least sensitive organ in the body = the brain
- the brain is 85% water
- the brain operates on the same amount of electricity as a 10-watt light bulb
- most sensitive part of the brain = meninges
- whitest part of brain = myelinated fibre tracts
- greyst part of brain = collections of neuronal cell bodies
- the brain is buoyed up by cerebrospinal fluid, otherwise it would squash itself
- warmest part of the body = centre of the brain
- largest cell in the body = motor neuron from spinal cord to big toe
- cerebral hemispheres = 83% of brain’s weight
- the human brain triples in size during the first few years of childhood
- the adult brain has 14 billion nerve cells and weighs only 1.4 kg
- the brain uses 25% of all the body’s oxygen - breathe in!
- one in 12 men is colour-blind
- blinking causes the eyes to be closed for a total of one hour each day
- women blink nearly twice as much as men
- there are 31 pairs of spinal nerves and 12 pairs of cranial nerves
- a nerve can send up to 1,000 impulses per second
- all nerves, laid end to end = 76 km
- one-half cm² of skin on the back of your hand has 12,000 nerve endings
- the body is more sensitive to pain late in the afternoon
- there are 30 times more pain receptors than cold sensors

Endocrine System
- adrenal glands produce the greatest number of hormones
- smallest endocrine gland = parathyroid
- largest pure endocrine gland = thyroid
- endocrine gland proportionately largest at birth = thymus

Integumentary System
- the skin is the largest organ of the body
- there are 650 sweat glands in one-half cm² of skin
- 500 million dead skin cells fall off daily due to ordinary wear and tear
- there are over 5 million hair follicles on the body, but none on the lips, palms or soles of the feet
- the average head has 100,000 hairs, with each one living 2-4 years
- 50-100 scalp hairs fall out daily
- fingerprints form 6-8 weeks before birth
- fingernails grow four times faster than toenails
- humans are the only primates that do not have pigment in the palms of their hands

Flavor - continued on page 15
Respiratory System
• humans breathe 20 times per minute, over 10 million times per year, and about 700 million times in a lifetime
• the larger lung lies on the right side and has three lobes; the smaller left lung has only two lobes
• you cannot kill yourself by holding your breath
• if you yelled for 8 years, 7 months and 6 days, you would have produced enough sound energy to heat one cup of coffee
• the largest sinus in the body is the maxillary sinus
• a sneeze creates a force of air moving nearly 160 km/h
• it is impossible to sneeze with your eyes open
• one cigarette shortens your life by 14 minutes

Reproductive System
• more babies are born between 3:00-4:00 a.m. than any other time of day
• sperm travel ≈ 3.5 mm/minute for a distance of ≈ 10 cm to site of fertilization

Some sources of anatomical trivia:
• http://www.corsinet.com/trivia/h-triv.html

Study Suggestions

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We all need ways to get students started on the right foot with good study skills. Over my years of teaching, I have come up with several things that I do on a regular basis.

For each text chapter included in my course, I provide students with a detailed list of learning objectives, a list of selected questions from the end of the chapter, and a set of my lecture notes in outline form. If there is a text figure or table that corresponds to a line in the outline, I include that text page number next to that line.

I evaluate the students’ knowledge and skills in lecture by giving only short answer questions to which the students must write the answers and, occasionally, either make labeled sketches or label sketches I provide. When students come to my office for help because they are not performing as well as they want on lecture tests, I use this list of suggestions as a framework 1) to find out what they do to learn, and 2) to suggest strategies and actions to improve. I also try to find out if non-academic factors (e.g., health, personal problems) are involved.

Study Suggestions
1. Schedule times to study for this course. Stick to your schedule.
   Study in a quiet place used for study purposes only. (For example, use the same table in the library all the time.)
2. Read text material related to lecture shortly after lecture.
3. Study diagrams and tables in the text and observe the illustrations on CDs, WebCT™, and web pages.

4. Note and refer to all text illustrations, CD animations and tutorials, web pages, or other materials pointed out in connection with the materials being presented or being studied.

5. Review material from each class before attending the next class. Write down any questions you have about the material you reviewed and ask those questions at the beginning of the next class. Do not let any question you have go by until you are satisfied with the answer you have gotten.

6. Ask questions in class whenever you are lost or confused or want more information.

7. Try using memory aids that work for you, or try new ones, such as:
   (a) picturing what you are studying in your mind.
   (b) making up a story that includes what you are trying to remember (practice telling other people your story).
   (c) creating mental pictures of processes occurring.
   (d) sketching pictures or drawing word pathways or concept diagrams of what you know.
   (e) studying when your energy levels are high, but not after eating a large meal.
   (f) avoiding large quantities of aspartame artificial sweetener (e.g., diet beverages).
   (g) avoiding distractions when learning.
   (h) organizing your material into large meaningful blocks rather than many unrelated details.
   (i) remembering lists by making up sentences or words where letters (e.g., first letter in each word, the letters of the words) stand for the items you are trying to remember.
   (j) putting the information into a rhyme or a song.
   (k) putting the information into the form of a story (e.g., sequences of events).
   (l) finding experiences in your life where the information is relevant or related.
   (m) writing what you think you know and have someone who does know check your work.
   (n) practicing answering questions like those on the tests.
   (o) practicing again.
   (p) getting restful REM sleep at night after you study. (Please tell me of other memory aids I can suggest.)

8. Use flash cards that ask questions like those on the exams to learn definitions, functions of structures, structures carrying out functions, causes of effects, steps in a process, etc. Put questions on one side and answers on the other side.

9. Record learning objective numbers beside notes or text material where appropriate.

10. Explain course material to someone. If that person cannot understand it, you probably do not either.

11. Answer all relevant End of Chapter (EOC) questions at the end of the text chapters in writing.

12. Use the CDs, other resources, and the companion web site to view what you are studying, for animations, for interactive learning, and for practice using what you learned.

13. Practice answering questions like the learning objectives. Use them and sample questions from class to make up and answer your own questions, including giving definitions, naming structures, listing functions, tracing pathways, putting events or causes and effects in sequence, and writing chemical equations. Answer these on blank paper (like a test paper would be). Practice answering them until you can write the answers automatically. Practice answering questions like those from class.

14. After studying on your own, study with someone or with a few others who are doing well in the class. This study should be a time of answering each other’s practice questions, solving each other’s problem areas, and quizzing each other. Use the ± marking method in your Course Booklet until all your minuses become pluses. Practice answering questions like those from objectives and lecture.

   Here is how to use the ± marking method. If a study partner asks a question and the student answers correctly, the partner places a + symbol next to that question. If a study partner asks a question and the student answers incorrectly, the partner places a - symbol next to that question. The student focuses on learning that specific item right away. Then, after the partner asks and marks a few more questions, the partner asks the first - question again. If the student answers correctly, the partner changes the - to a +. If the student answers incorrectly, the partner places another - next to that question. The student focuses on learning that specific item right away. The process is repeated until essentially all - symbols are changed to + symbols.

   Outcomes from this method include:
   (a) practicing answering questions and doing so in unsuspected sequence, as occurs on tests.
   (b) identifying and immediately correcting weaknesses or gaps in knowledge.
   (c) practicing trouble areas repeatedly.
   (d) creating a written record of trouble areas (i.e., questions having many symbols) for future extra attention.

15. Get enough sleep the night before a test. “All nighters” make your brain and your studying worthless.

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A new edition raises the bar for A&P instructors.

The Human Body in Health & Disease, 4th Edition
Gary A. Thibodeau, PhD; and Kevin T. Patton, PhD
2005 • 912 pp., 500 illus. (450 in full color)

It’s easy to see — the 4th edition is better than ever. It starts with a solid foundation, using a straightforward, easy writing style and a superior art program. A body systems approach emphasizes the basic concepts of A&P, and applies these principles to the real world by describing what happens when normal physiologic processes fail and result in disease. Here’s what’s new:

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Anatomy & Physiology Online to Accompany The Human Body in Health & Disease, 4th Edition
Linda Swisher, RN, EdD

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Textbook / A&P Online
The Oxygen-Hemoglobin Dissociation Curve and Venous Reserve

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The Oxygen-Hemoglobin Dissociation Curve is a fascinating aspect of the respiratory system. It is also a complicated graph whose understanding is hindered by the fact that my students typically do not have extensive experience with interpreting graphs, let alone molecular affinity. I use the following presentation to help students grasp the relationship.

I use about a dozen tennis balls as O₂ molecules. In addition to the graph, I write the following on the board and leave it until class is finished:

Glucose (C₆H₁₂O₆) + 6O₂ → 6CO₂ + 6H₂O + heat (+ 36ATP)

Occurs in all cells except red blood cells, all the time
Occurs in some cells more (or less) often, depending on that cell’s energy needs

To simplify matters I:

1. Limit the discussion to one hemoglobin molecule (Hb); if students know how one Hb reacts, they usually understand how they all work.
2. State that each Hb is able to bind/transport 4 O₂ molecules. Thus, at 100% saturation, Hb holds 4 O₂ molecules; at 75% saturation, Hb holds 3 O₂ molecules, etc.
3. Label the y-axis (percent hemoglobin saturation) with 0, 25, 50, 75, and 100%.
4. Label the x-axis (Po₂) with 0, 20, 40, 60, 80, 100%.
5. Point out that Hb is not smart; it does not know where it is in the body, or what it is “supposed” to do. It simply responds differently (by binding more or fewer O₂ molecules) when exposed to different conditions. This is an important point that needs to be stressed.

After introducing hemoglobin’s basic structure, I address the fact that the conformation (shape), and, thus, the affinity of hemoglobin for O₂ changes with hemoglobin’s state of saturation. While holding several tennis balls in my hand, I toss one at someone, and that person catches it (nobody has ducked yet!). What just happened? The person changed conformation, caught the ball, and is even more ready to catch ball #2. It is a simple and effective way to demonstrate hemoglobin’s concurrent changes in shape and affinity for O₂.

Next, I address the hemoglobin saturation curve. I explain that almost any graph can be described by following this simple procedure: Pick a value on the x-axis, find the part of the curve that is due north of that value, and then look to the left to find the corresponding value on the y-axis. Repeat this procedure using different x-axis values. Thus, without necessarily understanding the graph, we can describe the relationship depicted in the graph.

By following the aforementioned procedure with the O₂-Hb Dissociation Curve, we quickly reveal two pieces of information. First, through a broad range of high Po₂ (e.g., from ~70-104 mm Hg), hemoglobin remains virtually 100% saturated, holding 4 oxygen molecules. Second, at lower Po₂ values (~40 mm Hg and lower), a small change in Po₂ results in a large change in the percent hemoglobin saturation. For example, a drop in Po₂ (from 40 to 20 mm Hg) elicits a drastic reduction in hemoglobin saturation (from ~75% to ~25%).

Now, apply what has been described to see how the relationship affects a body at rest.

**Question #1:** Where is there a relatively high Po₂ (around 100 mm Hg)?
**Answer:** In the lungs.
**Meaning:** While in the pulmonary capillaries, hemoglobin binds a total of 4 O₂ molecules. Therefore, upon entering the pulmonary veins, hemoglobin is fully saturated (irrespective of the number of O₂ molecules it was carrying when it entered the lungs).

**Question #2:** Where is there a relatively low Po₂ (around 40 mm Hg)?
**Answer:** Inside cells.
**Meaning:** While in the systemic capillaries, hemoglobin becomes 75% saturated. Where did the 4th O₂ go? It diffused into a cell to be used in the oxidation of glucose.

**Question #3:** How does 75%-saturated hemoglobin respond when it returns to the lungs (pulmonary capillaries)?
**Answer:** Because we are breathing, the Po₂ in the lungs is still relatively high (around 100 mm Hg). Under this condition, Hb becomes fully saturated by picking up a fourth O₂ molecule, then exits the lungs.

During this discussion, I (Hb) carry 4 tennis balls (O₂ molecules) from my desk (the lungs with the remaining tennis balls) to a student (a cell) where I drop off one of the balls and return to the desk carrying 3 balls. At the desk, I once again pick up a 4th tennis ball, then walk over to another student where I...
Teaching Tips - continued from page 18
again drop off a single tennis ball, while explaining that resting cells throughout the body are being supplied with \( \text{O}_2 \) in a similar manner.

Following the discussion and demonstration, I apply the hemoglobin saturation principles to a body as it begins to exercise or more generally, when a given cell (or tissue or organ) begins to increase its activity. This allows me to address what some students have been wondering. It seems silly to go all the way to a tissue carrying 4 \( \text{O}_2 \) molecules just to drop off one, thereby returning to the lungs with 3. Why does hemoglobin not drop off all the \( \text{O}_2 \) molecules it carries? The simple answer is that it would, if the \( \text{PO}_2 \) at the tissues were low enough (remember, hemoglobin is not smart), but that detail will be explained later. Perhaps a better way of addressing the point is to consider what the implication would be if hemoglobin did drop all 4 of its oxygen molecules at resting tissues.

Now I ask:

**Question #4:** Where and when is there a \( \text{PO}_2 \) below 40 mm Hg?

**Answer:** In a cell as it increases its activity by increasing the oxidation of fuel.

**Meaning:** As before, hemoglobin approaches systemic capillaries 100% saturated. While in systemic capillaries, where nearby cellular \( \text{PO}_2 \) has dropped below 40 mm Hg (e.g., to 30 or 20 mm Hg), the saturation of hemoglobin becomes less than 75% (e.g., 50 or 25%, respectively). Where did the additional unbound \( \text{O}_2 \) molecules go? Again, they diffused into a cell to oxidize fuel and generate ATP.

During this discussion, I carry 4 tennis balls from the desk to an “active” student and dump 2 or 3 or all 4 tennis balls in his or her lap. Upon returning to the desk (where the \( \text{PO}_2 \) is still around 100 mm Hg), I pick up enough tennis balls to become fully saturated. Therein lies the beauty of the venous reserve. By typically dropping off only one \( \text{O}_2 \) molecule in the systemic capillaries, hemoglobin holds a reserve of three \( \text{O}_2 \) molecules that can be released to any cell needing \( \text{O}_2 \). Thus, by tapping the venous reserve, cells can increase their activity without the body having to immediately (or in actual fact, preemptively) increase cardiac output or respiratory rate.

A subtle and interesting extension of this discussion is to demonstrate that, while one part of the body (right biceps brachii) may increase its activity and need more oxygen, another part (left biceps brachii or pancreas, etc.) may not be more active than usual. How does hemoglobin know how much oxygen to deliver at each site? It does not. By simply responding to the ambient \( \text{PO}_2 \), hemoglobin drops off more oxygen to those cells that are using more, and less oxygen to those cells that are using less; in short, supplying cells according to their individual levels of activity. Hemoglobin is an amazing molecule.

**HAPS 2004 In Review**

**Review of Update Seminar #4**
Exploring the Inner Universe: Functional Magnetic Resonance Imaging (fMRI) of the Healthy and Diseased Brain

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Functional Magnetic Resonance Imaging (fMRI) permits visualization of hemodynamic changes associated with neuronal activity. This non-invasive imaging technique permits study of the function of the nervous system with greater spatial and temporal resolution than earlier techniques.

Functional MRI can be used to study sensory and motor functions and is being used increasingly to study cognitive functions in normal adults. Rao and coworkers studied normal adults during performance of a motor timing paradigm and a time perception paradigm to investigate the question: “How does the brain represent time?” The candidate brain regions that process time reproduction and perception were found to include parts of the basal ganglia, right inferior parietal cortex, bilateral premotor cortex, and cerebellum.

The same paradigms have been used to study Parkinson’s (PD) and Huntington’s patients, all of whom exhibit anatomical changes in the brain areas that process time. PD patients are impaired on a motor timing task (paced finger tapping or PFT) when compared with age-matched controls. The PD patients were studied in two sessions, one on dopamine and the second off dopamine. Functional MRI revealed decreased activation in sensorimotor cortex, cerebellum, and the medial premotor system in PD patients compared to controls. With dopamine replacement, there was...
increased activation in sensorimotor cortex, SMA, and putamen in the PD patients. While there was no change in PFT performance between the on and off dopamine states, the patient’s brain activation patterns became more normal with dopamine.

Functional MRIs of two groups of patients with presymptomatic Huntington’s disease have been obtained as these patients performed a time discrimination task. The two groups were based on estimated years to manifest disease; the close group was estimated to be less than 12 years from disease, and the far group to be greater than or equal to 12 years from disease. Results of the fMRI, images were compared to both behavioral tests and morphometric measurements of basal ganglia nuclei. The close group exhibited impaired performance on the task changes in fMRI, and changes in the volume of the caudate nucleus. The far group did not differ from control subjects on performance in the task or caudate volume. On fMRI, the far group showed changes throughout the basal ganglia and related cortical areas that were similar to, but not as profound as, fMRI changes observed in the close group. These data provide an early marker for Huntington’s disease at a time when treatment may be instituted to slow the development of symptoms of the disease.

The purpose of this workshop was to summarize different theories of learning and demonstrate how knowledge of learning methodology can assist anatomy and physiology instructors in enhancing student motivation and information retention. The session began with a discussion of how student populations are evolving. Changes that instructors and institutions need to consider include (1) increasing enrollments (with lowered funding), (2) increasing diversity (both in age and ethnicity), and (3) an increasing dependence on and demand for technology.

Mark Terrell pointed out that, for many instructors, teaching is challenging because most have not been formally trained in pedagogical techniques or theories. In addition, laboratory research in many universities is held in higher regard than is excellence in teaching. As a result, most faculty tend to teach using the manner in which they were taught and do not typically explore alternative methods of instruction.

Terrell continued by stressing the need to improve the “efficiency in teaching and learning of anatomy and physiology.” He suggested focusing on student-responsibility based models of learning. As he addressed the subject of improving memory and learning, he reminded the participants that the instructor is not the only person responsible for the students’ ability to learn, but that much of the responsibility falls upon the students themselves.

Terrell explained the behavioral and cognitive theories of learning. (Each theory has several variations.) Behavioral theory dominated teaching from the 1960s through the 1980s. The main goal of this theory was for students to minimize errors and to increase their rates of correct responses. Dividing learning into small logically ordered steps promulgated this theory. Unfortunately, the role of the learner using this method became quite passive.

Since the 1980s, there has been a shift toward the cognitive theory, which is more interactive. In using cognitive theories, teaching and learning focus on engaging the student in actively processing the information. To demonstrate the principle of cognitive theory, workshop participants were asked to perform an activity in which small groups discussed their own good experiences with learning and then created lists of what had made these learning experiences so positive. The groups then shared their lists and found that all contained many common
Cognitive theories have developed in three phases. The first phase focuses on information processing and involves linking short-term memory with long-term memory (permanent memory). Instructors can utilize this method by organizing and presenting information in a format that allows students to form a link between new information (entering short-term memory) and something that is already known (found in long-term memory). This allows the student to more easily retrieve the new information since there is now an association to or with something that is already known. To facilitate this linkage, instructors can prevent learning overload by helping the learners focus on critical information.

The second phase is based on metacognition or making learners more aware of their own learning. Learners actively participate by using self-testing to reflect on new information and to discover where adjustments in their learning strategies need to be made. Instructors can facilitate this learning method by modeling thinking and reasoning strategies and by providing study strategies such as concept maps.

The third phase is the concept of constructivism. With constructivism, students are encouraged to interact with their environment. By interpreting those interactions, they can create consistencies (or constructs) between past experience and new information. Through the use of problem-solving questions and by allowing students to work in groups, instructors can support this type of learning.

Following the workshop demonstration, Terrell pointed out that the most important factor in any learning is motivation. Instructors can use motivation to promote learning. Instructors can encourage student motivation – the desire to learn because they desire to learn – (1) by setting challenging, yet attainable, goals, (2) by giving students a feeling of control by allowing choices, and (3) by assisting students with learning strategies that lead to success. Instructors can also further enhance student motivation by demonstrating the relevancy of information and by helping to convince learners that they should and will succeed.

To conclude the workshop, Terrell emphasized that instructors need to focus on providing an education that lasts a lifetime, not just a semester. By understanding how people learn, instructors improve their teaching skills which, in turn, improves student learning. Students can be encouraged to take an active role in the learning process when their prior knowledge is linked to new information. When teachers “think outside the box,” they can improve information retention in students by setting achievable goals and reinforcing motivation through positive learning experiences.

**REPORTS**

**HAPS COMMITTEE**

**The Values of Using Perception™ for HAPS Combined Competency Exam**

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Perception™ is a secure database product produced by Questionmark Corporation that is used for “high stakes” examinations such as Medical Board Exams. The fact that it is quick and secure is minor compared to other capacities that this type of product extends to organizations like HAPS.

Perception™ requires the use of Questionmark Secure™, which stops other programs, copy utilities, chat programs, other processes that might allow the examination to be captured, and any form of communication by the student during the examination. The exam never leaves the secure server and can be administered anywhere an Internet connection is available. One might hasten to say that an exam proctor should always be present to see that cell phones and other photographic means of copying screens are not used and that the proper student is alone at the terminal taking the exam.

**Taking the Exam**

When the student links to the exam site, he/she is warned to save all work started on the computer because Questionmark Secure™ will shut down all other programs while the exam is running. The screen is then filled with the exam page; no other menu bars or mouse click options are available during the exam. The exam has its own scroll bar showing completed questions, time remaining,
and an option for flagging questions to which one may wish to return. There is an emergency (click [Quit]) option that requires special permission to restart. Once the questions are answered, clicking [Finish] brings up final instructions and an exit routine, which returns normal computer menu bars and options.

Individual students working in the same computer lab are not helped by looking at nearby terminals since the questions appear on each terminal in random order, and the answers are also in random order. This randomness makes students more aware of each choice, since no “pattern” can exist.

Creation of HAPS Fun Trial Exam

Since the environment is unique, and the idea of linking to an external site for an important exam can induce concern, we created a small 10-question trial exam, requiring the one taking the exam to know things like “Where does Santa Claus live?” This allows everyone to be familiar with his/her password and to see what happens when the Secure Server takes over. There still may be issues that we have not anticipated on the day that the HAPS comprehensive exam is administered, but that is the purpose of this trial – after all, we are scientific investigators.

Scoring

Monitoring of keystroke input and scoring of the exam with any type of comparison are done immediately. It will be our option to hold all scores and then inform the instructor of his/her class results. Scoring may be done on an absolute basis or on a percentile basis and compared to an historic database simultaneously. The main advantage is that now HAPS will now be able to tabulate each response from every individual taking the electronic exam. Previously HAPS has had less than 50% of participating instructors report HAPS Combined Competency Exam results and has never had the ability to review all answers made by each student.

Processing and Value of Incorrect Responses

Perception™ can create reports of the upper 27% and the lower 27% of students taking the exam to determine the questions with the good and bad discriminators. This information will be of great value to the Curriculum and Instruction and the Testing Committees, since it will point to the areas in which better questions need to be written. It also has the potential of informing HAPS and individual schools the curricular areas that need to be strengthened.

Organization within the Database Structure

Questions in the Perception™ Database are assigned to a curricular area so that evaluation of areas is possible. Instructors are able to recognize when a student is performing poorly in a particular area, and then to insert proper remediation instructions into the testing database. In the Physician’s Assistant Program at Trevecca Nazarene University, which has used this product for several years, there is an exhaustive set of instructions for identifying students who are weak in curriculum or practice, so that a “crisis” may be averted at the end of the semester.

Follow up Report at HAPS St. Louis

The Testing Committee presented a workshop at the Conference in St. Louis at which the results from about 200 students taking the HAPS Combined on Perception™, with a variety of reports indicating needs for future test modification, and a reflection on taking exams electronically.

Use for my own A&P class

I am very hopeful for positive results from my anatomy and physiology students this year. For two years I have deliberately not chosen their exam questions, but have randomly derived them from large databases. This practice benefited my teaching by making me work harder to help my students comprehend all of the material. It also encourages me to focus on some area of each chapter that I expect will be troublesome to my students in the future. Following a recent exam, I mildly chided the students for allowing questions on renin, angiotensin, aldosterone, and ADH to cause them so much difficulty. It took me two hours to calculate that 24% of their incorrect responses had come from that one area I had tried so hard to help them learn. If this exam had been administered in Perception™, it would have taken me less than two minutes to make the calculation that took me two hours to make; with Perception™, I would have discovered their weaknesses earlier.
HAPS Regional Conference
Coming to Maryland This Fall

“Promoting Excellence in the Teaching of Human Anatomy & Physiology”

The Community College of Baltimore County- Catonsville and HAPS will host a regional conference Saturday, October 22, 2005.

Our keynote speaker will be Renty B. Franklin, Ph.D., Department of Biomedical Sciences, Dental School, University of Maryland, Baltimore. The title of the address will be:

“Combining Basic Endocrine Research and the Teaching of Endocrinology.”

Workshops on varying topics of interest to teachers of Anatomy and Physiology, exhibitors, door prizes, lunch discussions and lots of time to network with colleagues will complete the activities of the day.

If you are interested in presenting a workshop, please contact Sarah Spence at SSpence@bccc.edu or Joanne Settel at jsettel@comcast.net

For additional information on the conference please contact Ewa Gorski at egorski@ccbcmd.edu

Looking Forward to Seeing You in Maryland This October
ANIMAL USE
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A three-year plan includes widely 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.

ANNUAL CONFERENCE
Henry Ruschin, Chair
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205 Humber College Boulevard
Toronto, Ontario, Canada M9W 5L7
(416) 675-9955 x4641
(416) 675-2015 fax
henry.ruschin@humber.ca

Formulates conference guidelines, assists the annual conference coordinators, and generates a list of conference sites.

CADAVER USE
Paul Krieger, Chair
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Develops guidelines for the use of cadavers in anatomy instruction.

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Reviews and revises, as needed, the HAPS Course Guidelines for Undergraduate Instruction of Human Anatomy and Physiology.

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Coordinated information exchange and dissemination through the HAPS Website, allowing members access to information from the organization as well as from other members.

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Promotes HAPS and functions as the liaison between HAPS and A&P vendors.

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Recruits new members, provides service to members, focuses on membership retention, and compiles membership information.

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Recruits nominees for the elected offices of HAPS.

PARTNER ASSOCIATIONS
Ric Martini, Chair
(see Nominating Committee for information)

Coordinates the pursuit of common goals, information exchange, and sharing of resources between HAPS and other professional societies.

PRESIDENTS EMERITI ADVISORY BOARD
William Perrotti, President Emeritus Liaison
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An experienced advisory group including all Past Presidents of HAPS. This provides advice upon request and adds a sense of HAPS history to the deliberations of the Board of Directors.

REGIONAL CONFERENCE
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Mentor coordinators of regional conferences. Anyone interested in hosting a regional conference should contact the Chair.

SAFETY
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Develops standards for safety in the laboratory.

STEERING
Thomas Lehman, Chair
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The Steering Committee consists of all Committee Chairs, coordinates activities between committees, and represents collective committee activity to the HAPS Board of Directors.

TESTING
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Completed, tested, and approved the HAPS Comprehensive Exam for human anatomy and physiology. Any HAPS member may obtain a copy of the test by writing to the Chair.

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