



HANDS-ON

Editor Jim Meadows

Happy Holiday Everybody

Editorial: Clinical Placements as Part of Residency for Fellowship in Canada.

There is a lot grumbling from clinicians currently engaged in the pursuit of Fellowship in the Canadian Academy of Manual Therapy (FCAMT) regarding need, convenience and cost of the clinical component for Fellowship. The general belief is that it is unnecessary, difficult to find and do and costly in the extreme and is put there by Orthopedic Division in order to weed out all but those who want to be among the elite and are prepared and able to pay for the privilege. Mostly these sentiments are born out of lack of knowledge and as much as I am not impressed with the direction the Division has been taking over the last few years, it should be understood that it had very little choice when it came to the implementation of the clinical residency.

The Orthopedic Division and the Canadian Academy of Manual Therapy (CAMT) are not related as parent and child. CAMT was born out of the Canadian Orthopedic Manual Therapy (COMP) a informal special interest group formed by Part B therapists that wanted an organization that would allow them to get together periodically and regularly and communicate throughout the year. It was never part of the CPA nor the Orthopedic Division. COMT's conversion into CAMT and its new role as representing Canada in IFOMT meant that it had to come under the umbrella of the CPA and this it did some years ago. CAMT is now the standards organization of IFOMT in Canada and is responsible for awarding Fellowships to graduates of affiliated Canadian programs meeting those standards, of which there are currently two, the Orthopedic Division and the North American Institute of Orthopedic Manual Therapy Canada (NAIOMT-C) which is preparing to begin teaching courses sometime next year). Canada has been a member of IFOMT for over two decades and has been allowed to maintain different, and many would argue, lower standards than other member countries. In the past IFOMT allowed Canada membership without having all of its graduates undertake any clinical resi-

(Continued on page 2)

Upcoming Courses

Jan 8-10	Level 3 Lower (1st. Part)	St. Louis, MO
Jan 15-18	Chronic MVA	Farfax. VA
Jan 22-24	Acute MVA	Helena, MT
Jan 28-30	Level 3 Lower (2nd. Part)	St. Louis, MO
Feb 4-6	Spinal Manipulation (1st Part)	Dallas, TX
	See main calender for rest of course dates	

For further information on courses contact jim@swodeam.com

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Who Said It?

Particularly pertinent to today's issue, see page 16 on theories, laws and hypotheses.

As far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality.

Editorial Continued

gency provided the examinations were open to therapists who had not taken Division courses and that two intermediate or long term courses that included direct clinical supervision existed on both sides of the country. Both of these conditions were met until the retirement of Wendy Aspinall and the consequent loss of the Eastern intermediate course and for this reason and others, the Division had to implement the standard that other IFOMT member countries have to meet, the supervised clinical component. In fact the requirement is less than that called for by the standards organization in the USA which requires 130 hours of direct supervision and 310 hours of semi-supervision, standards far exceeding IFOMT's basic requirements. So it could be worse.

As to convenience, all education is inconvenient but it can be made less so with some thought. The required clinical experience is a minimum of 100 hours or about three weeks depending on how many hours a week you want to work. But there is no real need for all of those hours to be done at one time or in large blocks, and with a little imagination the education organizations running the residencies could tailor them to the individual needs of the residents and the supervisors. One day a week, three one-week blocks or any other format are all at once are all eminently possible and there is no evidence that one method works better than the others.

There is always a cost to education, whether it is direct tuition fees, books, time off work or away from home living costs. There is also a cost in time away from family and the sheer nervous energy involved in the stress of examinations. But only the financial cost can be dealt with by the organization. The supervisor must be reimbursed for income lost through supervising the resident and this will be at least \$100 per hour unless you can find a wealthy saint. So figure on a minimum of \$10,000 for the 100 hours plus all of the other costs mentioned above. But there are ways of offsetting the cost to some extent. For example live patient examinations can be carried out during the residency eliminating the need for Fellowship residents to take a separate lab based oral/practical examination and so cutting this cost. Both the Division and NAIOMT-C have pre and post course tests and the Division could easily replace the written examination with these (at the moment they are not even used in the quest for Fellowship). If these are given as on-line tests where marking by the computer saves time and money, this would go a fair way to offsetting costs. Finally the Division really needs to re-think whether doubling up on the length of the classes is really the best way to go when other organizations are generally reducing class time and increasing the distributed material content of programs especially when the educational literature is suggesting it is actually a better way of learning academic material. This would cut down the cost of residency substantially.

In short, students of manual therapy *do* want clinical instruction but naturally they want it at no cost and no inconvenience to them. Life says that this is not do-able so there is a conflict in what is wanted and what is realistic. But the cost and inconvenience can and must be reduced by an imaginative and sensible approach to the issue and not simply an arrogant demand that it be done regardless of the cost and inconvenience.

Letters and Comments

None as yet.



Swodeam Courses 2004

2004	Course	Location
Jan 9-11	L2 Lower (A)	St Louis, MO
Jan 16-18	L2 Lower (B)	St Louis, MO
Jan 23-24	L2 Upper (A)	Houston, TX
Feb 6-9	L2 Upper (A)	Houston, TX
Feb 13-15	The Acute MVA Patient	Washington, DC
Feb 20-22	Lower Limb	Baltimore
Feb 27-29	L 3 Upper (A)	Madison, WI
Mar 2-4	Clinical Practice	Dallas, TX
Mar 5-7	L3 Upper (A)	Dallas, TX
Mar 12-14	Peripheral Manipulation	Colorado Springs, CO
Mar 19-21	L3 Upper (B)	Milwaukee, WI
Mar 26-28	L3 Upper (A)	Quebec City, PQ
Apr 2-4	L3 Upper (B)	Quebec City, PQ
Apr 16-18	L3 Upper (B)	Dallas, TX
Apr 23-25	The Chronic MVA Patient	Ithaca, NY
Apr30-May 3	Spinal Manipulation (A)	Boston (MA)
May 7-9	Spinal Manipulation (A)	Fremont, CA
May 14-16	Spinal Manipulation (B)	Fremont, CA
May 21-23	L2 Lower (A)	Portland, OR
May 29-31	Acute MVA	Quebec
Jun 4-6	Peripheral Manipulation	Ottawa, ON
Jun 11-13	Spinal Manipulation(C)	Fremont, CA
Jun 25-27	Spinal Manipulation (B)	Boston, MA
Jul 16-18	L3 Upper (A)	St Louis, MO
Aug 13-15	L3 Upper (B)	St Louis, MO
Sep 10-12	The Acute MVA Patient	Tacoma, WA
Sep 17-19	The Acute MVA Patient	Everett, WA
Sep 24-26	The Chronic MVA Patient	Ottawa, ON
Oct 1-3	The Chronic MVA Patient	Edmonton, AB
Oct 8-10	Lumbar Thrust	San Diego, CA
Oct 15-17	L3 Lower (Lower Quad)	Quebec City, PQ
Oct 22-24	L3 Lower (Lower Quad) 2	Quebec City, PQ
Oct 29-31	L3 Lower (A)	Detroit, MI
Nov 1-4	Clinical Placement	Detroit, MI
Nov 5-7	L3 Lower (A)	Detroit, MI
Nov 12-14	The Acute MVA	Boise, ID
Nov 26-28	Chronic MVA	Saskatoon, SK
Dec 10-12	Cervical Spine	Baltimore

All courses unless specifically stated are combinations of lecture and lab, usually about 50/50. Each course is organized by a local coordinator and for contact to that person please email Jim Meadows at jim@swodeam.com

For further information on courses contact jim@swodeam.com

Swodeam Courses 2005

2004

	Course	Location
Jan 7-9	Level 3 Lower	St. Louis, MO
Jan 14-16	Chronic MVA	Fairfax, VA
Jan 22-24	Acute MVA	Helena, MT
Jan 28-30	Level 3 Lower	St. Louis MO
Feb 4-6	Spinal Manipulation (1)	Dallas, TX
Feb 11-13	Upper Limb	Baltimore, MD
Feb 18-20	Spinal Manipulation (2)	Dallas, TX
Feb 25-27	Level 3 Lower (1)	Madison, WI
Mar 10-15	Level 3 ?	Colorado Springs, CO
Mar 18-20	Level 3 Lower (2)	Milwaukee, WI
Apr 1-3	Level 3 Upper (1)	Fairfax, VA
Apr 22-24	Level 3 Upper (2)	Fairfax, VA
Apr 29-May 1	Spinal Manipulation (3)	Dallas, TX
May 6-9	Manual Therapy Symposium	Quebec City, PQ
May 13-15	Spinal Manipulation (1)	Syracuse, NY
May 20-22	Peripheral Manipulation	Freemont, CA
June 10-12	Chronic MVA	Boston, MA
June 14-20	NAIOMT Conference	Washington, DC
July 15-17	Level 2 Upper (1)	St. Louis, MO
July 22-24	Spinal Manipulation (1)	Calgary, AB
July 29-31	Spinal Manipulation (2)	Calgary, AB
Aug 5-7	Level 2 Upper (2)	St. Louis, MO
Aug 19-21	Spinal Manipulation (3)	Calgary, AB
Aug 26-28	Acute MVA	Tulsa, OK
Sep 9-12	Differential Diagnosis	Portland, OR
Sep 16-18	Level 1 (1)	Dallas, TX
Oct 2-4	Chronic MVA	Berrien Springs, MI
Oct 7-9	Chronic MVA	Detroit, MI
Oct 10-13	Clinical	Detroit, MI
Nov 4-6	Level 3 Lower (1)	Fairfax, VA
Dec 2-4	Level 3 Lower (2)	Fairfax, VA

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of lecture and
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The Phase Transition Model of Segmental Dysfunction

In the last issue the editorial discussed the concept of models in manual therapy. To illustrate that concept this article will look at the segmental dysfunction and how that can be modeled. As stated last month a good model is not necessarily the truth, in fact it usually is not the truth nor anything like it, but rather it is a conceptual framework that allows its user to visualize the phenomenon and so more effectively understand the relationships between the facts of the phenomenon and between the phenomenon and the observer. In manual therapy it allows us to bundle the examination clinical findings into a diagnosis and treatment. The best model incorporates the most facts and the worse model the least. As new facts emerge they are either successfully incorporated into the model (that is explained by it) or the model is modified or abandoned and a new one substituted. Treating concepts as the truth rather than as a model and failure to expand, reduce or abandon models as more information is made available results in credibility loss and confusion when visualizing the phenomenon.

If no facts are incorporated then the term fantasy should be used rather than model. In addition to incorporating as many facts as possible a good model is economical; that is the model is as simple as the facts allow. During the reading of this article remember that no model is the correct model as correct is not a term that should be applied to models, you simply have to decide if it fits the clinical facts and that the model works for you.

Generally ideas on biomechanical dysfunction of the spinal segment fall into one of three main camps, segmental instability, segmental hypomobility and a mixture of the two. Currently segmental instability is enjoying a good deal of popularity thanks mostly to the research coming from Australia and coming from Jull, Richardson, Hides and Hodges¹. It is worth noting that although these people have done some excellent work on biomechanical instability they did not invent the concept of it. This has been around for many years but did not have the respectability of good research. Unfortunately, as is the usual case, moderation goes out of the window in the light of good research and now many therapists have thrown out the idea of hypomobility as a major consideration in mechanical spinal pain. I hasten to add that this is not the fault of the researchers in the field but rather of the need of the consumers of the literature to need something new and fashionable.

Hypomobility on the other hand had been dominant for too long with mobilization and manipulation being almost the only techniques used to treat segmental biomechanical dysfunction with the odd, non-specific exercise thrown in to differentiate us from the chiropractors, who our legends have it, do not give exercises (how easily an entire profession can be dismissed). A mixture of the two ideas has been around for a long time with manual treatments still taking the pre-eminent place but with a nod to the need for an assessment of and treatment for instability if found. So for the purposes of this discussion we can take a look at the two pure theories of segmental dysfunction and see how they fit the facts as we know them.

Instability is currently considered as the result of failing segmental stabilizing muscles, mainly the multifidus, transverse abdominus, and maybe psoas in the lumbar spine, the multifidus and the prevertebral muscles in the cervical spine and multifidus, piriformis and the pelvic floor muscles in the pelvis plus the larger muscles such as latissimus dorsi and the abdominal obliques. Pain or reflex inhibition causes the muscles that control translation to become inadequate and there is an increase in the neutral zone resulting in more reflex inhibition that then leads to end zone instability at which time pain and dysfunction may make an appearance. Just to complete the picture, or at least add to it, it would seem likely that not all insidious segmental instability is the result of muscle failure but may result from excessive mechanical stress applied over a prolonged

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period of time. The observation that hypomobility of the hip is associated with low back pain would tend to support this. The consensus among clinicians that have written on the subject is that the patient suffering from segmental instability will present with most if not all of the following^{2,3,4,5}.

1. Short duration episodic pain
2. Minor triggers causing the pain
3. Mild to moderate pain
4. Mild to moderate referral
5. Full but abnormal range of motion between painful episodes
6. Abnormal segmental end feels
7. Treatment fail to provide long term relief

These observations plus the research using EMG, MRI and biopsy studies are the “facts” of the model of segmental dysfunction being caused by segmental instability. The model proposes that mechanical spinal pain is the result of instability but the actual mechanism for pain production is very vague and is often cited as muscle spasm or hypertonicity causing painful ischemia of the muscle or the loss of control of the segmental allowing slipping to result in inflammation. The success of the model comes from the incorporation of these “facts” and therapist’s acceptance of the model. Episodes of pain are explainable by minor trauma nudging the unstable segment into a painful state, the abnormal movements during the pain free phases are explained by lack of normal motor control, The short duration of the episode by minor trauma nudging it back again and the fact that treatment fails to provide long term relief by it not adequately addressing the motor control of the segment. It is economical in that it proposes only one pathology to explain the facts rather than a different pathology for each fact. Its weakness lays in not explaining why mobilization or manipulative therapy is so successful in reducing the patient’s symptoms and increasing range of motion sometimes immediately and the method of pain production. If the pain is the result of increased tone or spasm in the muscles then this is at odds with the idea of inhibition being the root of the instability. If the pain is caused by inflammation why can this pain be eliminated by mobilization or manipulation as this obviously cannot beneficially affect the inflammation.

The hypomobility model incorporates the same observational facts as the instability model but does not have the same research backing it up. In this model the patient’s pain and dysfunction results from a joint that is jammed or subluxed or fixated or whatever term is current and local. In essence the joint is caught at one end of its range and cannot move in the opposite direction. For example, a joint that is jammed into extension would cause a flexion hypomobility affecting both the passive physiological movement and the arthrokinematic associated with that movement. The mechanism of the subluxation is itself a sub-model and ranges from incongruencies in the secondary or tertiary contours of the joint, through meniscoid entrapment to misalignment of the primary contours. There is also a neurophysiological sub-model to explain this jamming which consists of hypertonicity of the muscles from pain (a somewhat twisted argument as the pain causes the hypertonicity and the hypertonicity causes the pain). Apart from the lack of research evidence, which in itself is not a fatal flaw in the model, the failings are that in the absence of overt trauma there is no good mechanism for the subluxation to occur and there is no good reason for recurrences to occur, that is for the problem to be short term episodic.

The mixed model is better in that address all aspects of the “facts” and integrates them. The mixed model goes something like this. There is an underlying basic unstable state or matrix, which is in itself painless. This explains the painfree episodes. But a minor force or trigger subluxes the joint which may then cause a painful phase (however not all subluxations are painful as we can attest from examining asymptomatic students on courses). The pain is caused either by overstretching of the ligaments and capsule of the subluxed joint or by adjacent joints becoming painfully hypermobilized as they are overstressed by the subluxed joint. This explains the painful phase. The patient is obviously seen by the therapist in the painful phase when the joint is

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subluxed and so the condition is vulnerable to mobilization or manipulation. The patient improves, often becoming completely painfree with full movements restored immediately but fails to maintain the improvement for varying periods depending on how unstable the segment is or what activities the segment has to tolerate. These last considerations explain why not all instabilities are painful or dysfunctional and why a previously asymptomatic person can become chronically painful with say two or three jogging sessions even though the running is discontinued quickly. It also explains why whiplash can have such a devastating effect on a previously asymptomatic subject even though the delta-v is so low. Consequently the mixed model is better than either of the two pure models in that it incorporates both sets of clinical observations, the research findings on segmental instability and the effectiveness of manual treatments in reducing or eliminating the pain. It also explains the episodic nature of the condition that the hypomobility model fails to do and the pain mechanism that is poorly explained by the instability model. Lastly it is economical in that to properly explain the dichotomous nature of the mechanical spinal pain syndrome each pure model would have to propose two or more pathologies, one for the painful phase and the other for the pain free phase.

Finally a name should be given to the mixed model that describes the model adequately. I propose the term Phase Transition Model. A phase transition is where there is a radical change in the behavior characteristics (properties) of a substance or a system without a proportional change in the composition of the substance or system⁶. The term is used in physics, particularly cosmology where it is used to describe the big bang and the inflationary period of cosmic evolution but a simpler example is the phase transition that occurs when water changes to ice or vice versa. Water and ice are almost two completely different substances as far as their behavior is concerned. Ice cannot put out fire until it changes to water, ice is extremely slippery, water considerably less so, a bucket of water tipped over you from 15 feet will make you wet, a bucket ice will make you dead. While the term is strictly used to describe fundamental property changes in thermodynamic systems there is no reason why it should not be used here with good effect. The phase of instability is painless, mobile and leaves the patient fully functional. Assessment during the unstable phase with stability tests will, on a good day, demonstrate instability and the passive physiological tests hypermobility while during the painful phase passive physiological mobility test will demonstrate hypomobility with all the characteristics of subluxation and the stability tests will show stability. In effect the segment goes from the matrix of instability to hyperstability and from a painless state to a painful state. It undergoes transition from one phase to another and back again as effective forces are applied.

In summary this article has looked at the construction of a model to explain the clinical observations and research findings of mechanical spinal pain. Two pure models were discussed and found to be inadequate explaining all of these observations and findings.

A mixed model which incorporates both pure models was found to be a better model in that it explained all of the clinical observations as well as incorporating the research in an economical manner. I have suggested that the term phase transition be used to name the mixed model. The advantage to this type of approach is that the user knows going in that it is not the truth and so when new facts emerge that are not explained by the model it can be abandoned or modified with no credibility loss for the profession or individual and no sense of loss as there is no personal investment in the model as there would be if the author really believes that he or she knows the truth. The truth may in fact never be known and it certainly is not known currently but with a rational and scientific approach the condition of mechanical spinal pain may be usefully visualized and that can only help in its diagnosis, prognosis and treatment.

(Continued on page 8)

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6. <http://www.site.uottawa.ca:4321/astronomy/index.html#phasetransition>



Manual Therapy Videos Now Available DVD.

The video series manual therapy is now available on DVD. The VHS tapes have been converted into 10 DVDs each with an interactive menu. The 10 discs cover differential diagnosis, selective tissue tension testing basic and advanced biomechanical examination and diagnosis, biomechanical treatment and the assessment and treatment of the post-MVA patient. All areas of the body including the spine, peripheral joints, TMJ, SIJ and ribs are covered.

The video was made and produced at KWGN-TV in Denver, CO and as such is of professional quality and includes picture-in-picture of picky or complex techniques.

The full retail cost of the set is \$700 but for a limited time subscribers to Hands-On and previous students of Jim Meadows and to past purchasers of the tapes can buy the set at 50% discount, a cost of \$350 including mailing and handling (Canadian Dollars at par with US Dollars). To order send a cheque made payable to James Meadows to:
413 Interamerica, Ste. 1
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For further information go to my web site at www.swodeam.com or contact Jim Meadows at jmeadowspt@aol.com or by phone at 586 596 7424.

Quizzes For Fun: November's Solutions

Word Jumble

A	S	C	S	D	A	C	T	I	N
S	C	L	E	E	M	O	O	L	R
T	R	L	P	L	I	C	A	D	O
R	I	H	I	B	N	H	S	S	L
X	C	I	S	O	E	T	P	N	F
P	O	N	I	W	L	I	I	X	E
O	I	W	F	X	T	E	N	C	R
N	D	E	O	X	Y	G	E	N	Y
S	C	A	R	E	A	N	E	F	T
A	A	W	M	A	S	S	A	G	E

A. Answer the following about research:

1. What is the difference between a theory and a hypothesis

Turns out that the answer is more complicated now than when I thought I knew the answer at the time I posed the question. Go to page 16 for the answer.

2. True or false; validity is can only established by experiment

False, there are many levels of validity that do not require experiment and in fact most of our practice by far is based on non-experimental validity but specificity and sensitivity values can only be determined by comparison with some form of gold standard.

3. What is the difference between sensitivity and specificity

Sensitivity is how often the test will be positive in the presence of the condition being tested for. Specificity is how often the test will demonstrate a true positive and by subtraction how often it will be falsely negative. In both cases these values are found by comparing the test with how often the phenomenon is found by a gold standard so sensitivity and specificity are very dependent on how good the gold standard is. Unless the two values are 100% then you cannot state that a negative test means that the condition is not present or that a positive test means that the condition is present. In both case you can only talk about probability.

4. What are descriptive statistics

These describe the sample rather than the study's results and include things such as average age, ratio of males to females, standard deviations of age, height etc. They help the reader determine how close the sample is to the population under study.

B. Answer the following about anatomy:

1. What are Muller's muscles

Also called the superior and inferior tarsal muscles they are small sympathetically driven controlled by the Edinger-Westphal nucleus that cause both eyelids. Paralysis results in a small degree of ptosis that is correctable by the patient on command.

2. Where are the utricle and sacule and what are their functions

These are small areas in the vestibule of the labyrinth which respond to gravity rather than movement and so maintain antigravity muscle tone when the head adopts a maintained position. It is gravity acting on the otoliths or otoconia that stimulates the cilia.

3. With which artery does the posterior communicating artery of the brain communicate

Middle cerebral.

4. What is the function of the Edinger-Westphal nucleus

This is part of the 3rd. Cranial nerve and is responsible for controlling the intra-ocular pupil constrictor muscles when light levels rise. It is a parasympathetic response.

C. Answer the following about pathology:

1. With what condition is paralysis of Muller's muscles commonly associate

Horner's syndrome

2. What is type 1, 2 and 3 dizziness

This is a symptom based classification as opposed to the etiology based classification of central versus peripheral dizziness. Type 1 dizziness is vertigo/oscillopsia and for the most part is caused by disturbances to the balance system. Type 2 is presyncope dizziness and is very non-specific in character and can be caused by cervical dysfunction, fever, food poisoning, neurological disease and injury etc but is generally not caused, at least as an isolated symptom by acute labyrinthine disturbance. Type 3 is disequilibrium and if not associated with type 1 dizziness is usually the result of neurological disease or non-acute labyrinthine disorder. All types can be caused by vertebrobasilar ischemia.

3. What is the name of the distribution system that shunts blood between the hind and fore brain

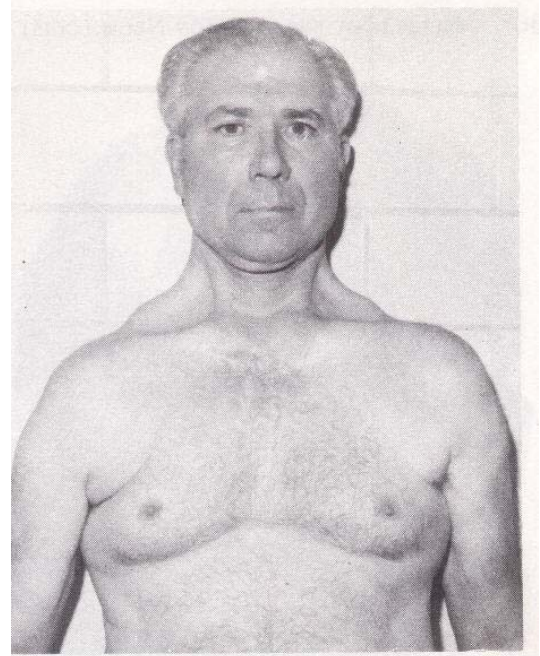
The circle of Willis connects the hind brain system with the fore brain system by the posterior communicating artery.

4. Define miosis

A constriction of the pupil that may be a congenital variant or an indication of pathology. In the latter the pupil fails to respond normally with changing light conditions. For us the condition that it is found in that has most significance is Horner's syndrome which is either preganglionic (above the stellate ganglion and usually most severe) or postganglionic which with the exception of breast and apical lung cancer as causes, is generally caused by less severe conditions.

D. What is wrong with this man?

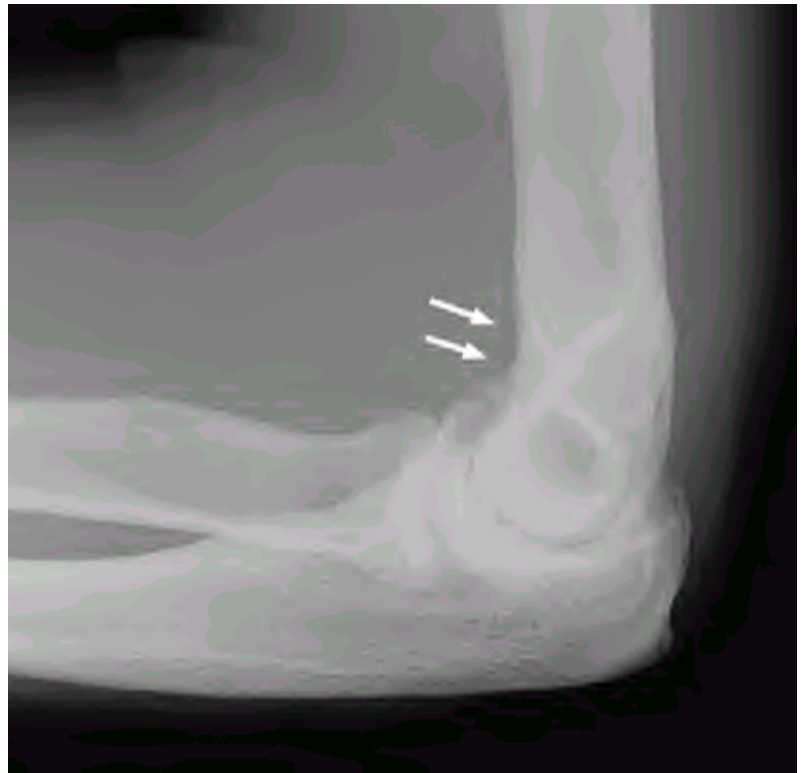
There are a couple of things that can be observed, the most obvious is the altered shape of the upper trapezius. There is a lump in them that appears to be hypertrophy but which in fact is the first rib, seen as a result of atrophy caused by peripheral motor neuron disease. Also seen are creases in the pectoralis major muscle near the axilla. This is caused by dropping of the shoulders which can be picked up by looking at the downward slant of the clavicles (right worse than left).



D. What do these radiographs suggest for pathology? Hint, it is a post-traumatic condition.?

Atlas of Signs in Musculoskeletal Radiology is approved by the ARRS (American Roentgen Ray Society) and is included in AJR Webreview
<http://www.gentili.net/signs/11.htm>

Normal lateral radiograph of the elbow. B. Plain film radiograph of the lateral elbow which reveals the classic elbow fat pad sign. This is an invaluable soft tissue finding in cases of intra-articular injury of the elbow. Fat is normally present within the joint capsule of the elbow, but outside the synovium. Typically "hidden" in the concavity of the olecranon and coronoid fossae, the fat is usually not visible on the lateral radiograph. However, injuries that produce intra-articular hemorrhage cause distension of the synovium and forces the fat out of the fossa, producing triangular radiolucent shadows anterior and posterior to the



December's Quizzes for Fun

Find the Words. Bonus; there is the name of an old TV show in here, find it for extra points but no extra reward!

F	C	R	U	C	I	A	T	E	T
R	R	O	L	A	L	D	E	W	S
A	I	N	A	R	T	E	N	I	S
G	B	E	B	P	O	N	S	A	V
G	I	D	R	I	R	O	L	P	A
L	F	D	O	B	I	M	A	S	S
E	O	L	N	M	B	A	E	Y	T
R	R	E	T	O	E	X	I	S	U
O	M	E	A	X	O	N	S	S	S
C	T	R	A	C	T	I	O	N	D

A. Answer the following about anatomy.

1. Define the word myotome
2. Give one example of a myotome
3. Define the term key muscle
4. Give an example of a key muscle

B, Answer the following on mechanics.

1. Define the term traction
2. Define the term shear
3. Define the term torque
4. Define the term toque

C. Answer the following on pathology

1. What are the main clinical characteristics of inflammation
2. How can you establish absolute levels of pain
3. How can you establish relative levels of pain
4. What is the advantages of using a numeric or visual analogue system of rating pain

D. Answer the following questions on research

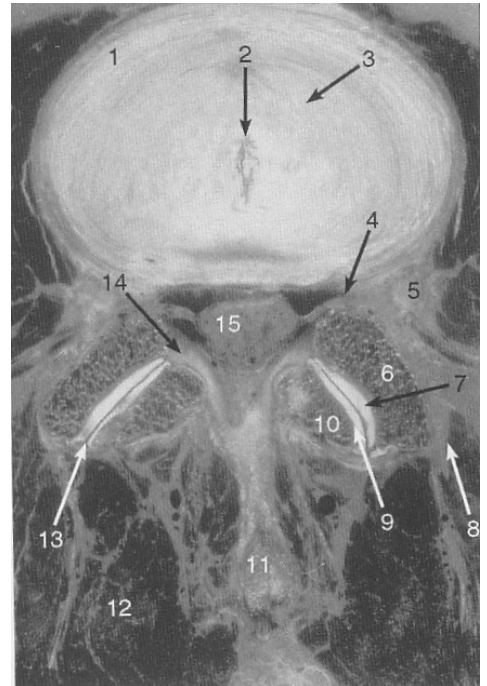
1. What is meant by the power of a study
2. How is a good sample size determined
3. What is meant by the term "gold standard"
4. What is the difference between average and mean

Name That Structure November's Answer

This is a lower thoracic segment. Note the asymmetrical zygapophyseal joints.

1. Outer anulus
2. Nucleus pulposus
3. Inner anulus
4. Dentate ligament
5. ??
6. Inferior articular process
7. Superior facet surface
8. ??
9. Inferior facet surface
10. Superior articular process
11. Spinous process
12. Multifidus
13. Zygapophyseal joint
14. Ligamentum flavum forming the anterior joint capsule

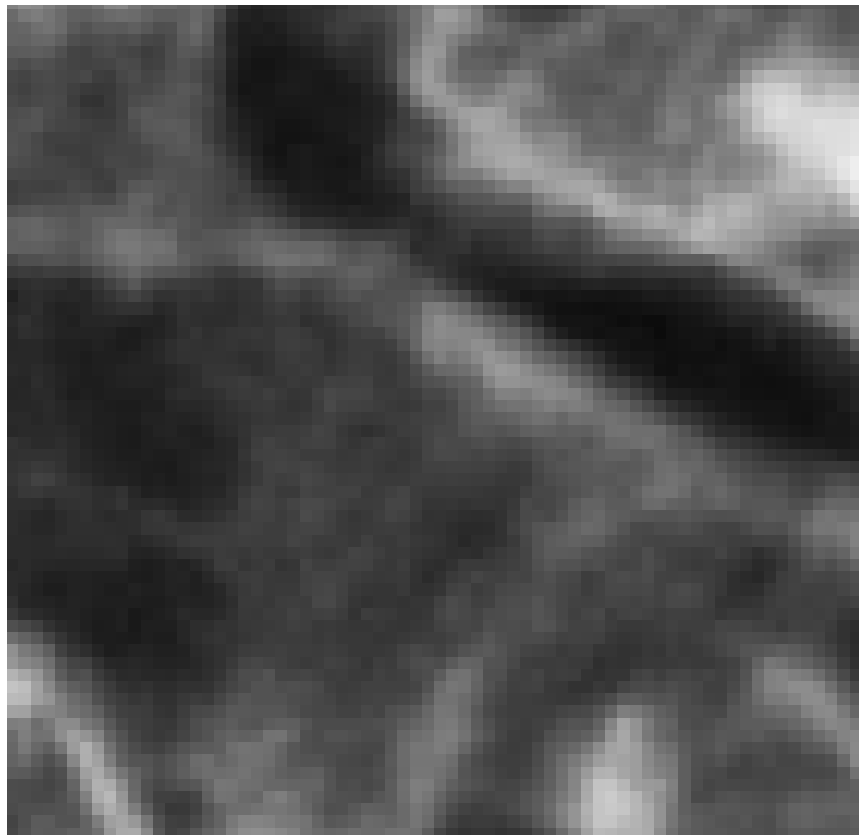
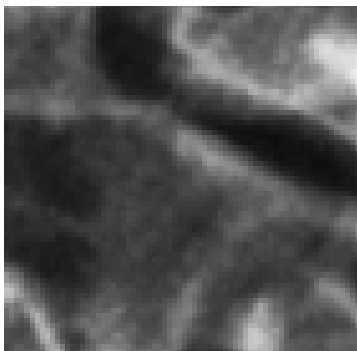
Now I know what 5 and 8 are(!!!) but does anybody else, if so send in your opinion and after due consideration I'll let you know if you're right



Name That Structure

This is part of an anatomical structure, what is it?

Large and small views of the same part of an X-ray.



Hypothesis, Theory and Law

In every-day use the term theory means an idea of something that is true while hypothesis is used to denote a good guess and law is something that is immutable, that is always is true and always will be true. But science, and I am using the term in its most rigorous sense, uses the terms differently. First the term Law is considered almost obsolete as it is believed that nothing known is immutable. For example, Newton's Law of gravity has been superceded by Einstein's General Theory of Relativity with Newton's "Law" only be an approximation when compared to Einstein's. In turn it is likely that General Relativity will become part of a larger theory incorporated into it together with quantum theory. And in the future as more information becomes apparent this larger theory may be subsumed into an even larger one. The term Law, in effect has been replaced by the word theory, which is mutable.

A theory is a statement about a complex system such as evolution, thermodynamics, gravity or cosmology or closer to our own field germs as a cause of disease. It is based on numerous sets of investigations duplicating each other's results. Theory can predict results and even postdict events and must be vulnerable to being disproved. For this last reason some people argue that evolution is not really a theory as it cannot be disproved with today's technology. For the same reason String Theory, which explains the universe on the subatomic level, is thought by many theorists not to be a theory even though the mathematics work well. The term model may be better in these cases.

"A theory is more like a scientific law than a hypothesis. A theory is an explanation of a set of related observations or events based upon proven hypotheses and verified multiple times by detached groups of researchers. One scientist cannot create a theory; he can only create a hypothesis. In general, both a scientific theory and a scientific law are accepted to be true by the scientific community as a whole. Both are used to make predictions of events. Both are used to advance technology. The biggest difference between a law and a theory is that a theory is much more complex and dynamic. A law governs a single action, whereas a theory explains a whole series of related phenomena." <http://wilstar.com/theories.htm>

The word hypothesis is something that is not proved but is assumed to be true for argument or study. Consequently it is used in research as the question or the null question and is usually an assumption about a small aspect of a larger issue.

Hypothesis Defined: Something not proved but assumed to be true for purposes of argument or further study or investigation.

Hypothesis n 1: a proposal intended to explain certain facts or observations 2: a concept that is not yet verified but that if true would explain certain facts or phenomena.

http://www.natick.k12.ma.us/schools/wilson/webquest/norton/internet_webquest/pwrimages.html



**Don't curse the
darkness, light a
candle.**

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Video Tapes Digital Conversion Update

The video tapes series Manual Therapy by Jim Meadows has now been converted to DVD format and is ready for sale now. There are 50% discounts available for past buyers of the video tapes and for past students of my courses and 30% discounts for subscribers to this newsletter and to NAIOMT students (for a limited time subscribers and NAIOMT students will also receive a 50% discount). The full price of the complete set of DVDs is \$700 US with the Canadian dollar at par for Canadian residents. The MVA video is available alone for \$70. See page 9 of this issue for a pretty picture but for further information on the content of the video see my web site.

