Veterinary Pathology 2011

Joining the exciting Virtual World
Context of Veterinary Pathology

• Semesters 1-4
  – Normal Structure & Function

• Semester 4  BVSc & BAnVetBSc
  **Principles of Disease / Introductory Veterinary Pathogenesis**
  – General pathology
    • FIVE pathological processes
  – Introduction to Infectious agents
  – Disease as outcome of HPE interactions

• Semester 5  **Veterinary Pathology**
  – Systemic pathology
    • Anatomical pathology in conjunction with pathophysiology
    • Diagnostic Pathology

• Semester 6  **Veterinary Clinical Pathology & Laboratory Medicine**
  – Diagnostic pathology with emphasis on pathophysiology

• Semester 5
  **Veterinary Microbiology** (agents of disease)
  **Veterinary Parasitology** (agents of disease)
  **Veterinary Pharmacology & Therapeutics** (manipulation of pathophysiology)

• Semester 6
  **Animal Disease** (infectious disease)
  Small Animal Medicine (clinical management)
  • Semesters 7-10
    Equine Medicine
    Production Animal Medicine & Production
Learning Environment
(+ where we failed to engage students)

• The dim distant past
  – Lecture theatre

What we think that we teach! What the student learns?
The Lymph Node

What do students see when I show them this?
The Lymph Node

What do students see when I show them this?
Learning Environment
(+ where we failed to engage students)

• The dim distant past
  – Practical class
    • Microscopy Laboratory (the activity was divorced from how to perform the activity)
      Inadvertently focused on type specimens
      Rather than on discovery

NOTE – there are still good reasons why our graduates should be able to use microscopes
• Limited alignment between learning task and desired learning outcomes
• We provided little contextual framework in which to place information
• We gave extremely limited instruction about the process of microscopic diagnosis

• RESULT = student failure to engage with the discipline effectively and adoption of surface learning approaches
Learning Environment
(+ where we failed to engage students)

• The dim distant past
  – Practical class
    • Microscopy Laboratory *(the activity was divorced from how to perform the activity)*
    • Wet Laboratory
      – Direct applied anatomy
      – Direct contextual relevance
Learning Environment
(+ where we failed to engage students)

• The dim distant past

• The not-so distant past
  – From 2002 we replaced approx 15% of didactic teaching hours with self-directed learning exercises (Case-Based Learning i.e. contextual learning)
    • Reliant on data and static representations of microscopic pathology and other diagnostic modalities
Case file review

The patient


Verral 'Poppy' was taken to a local veterinarian, who noticed a PCV 0.13 L/L (or 13%) and icterus, which prompted urgent referral to the University Veterinary Centre, Sydney.

At the referral centre, empirical therapy was administered.

Activity, you will need to fill out the Case Report form (in the red box on the right hand side of the page). To help you do this, you can learn more about the patient (Consulting room section), the pet's test results (Diagnostic aids section), outcomes of the case (Outcomes section) and complete the case study (Learning support section).

When you have filled in the Case Report form, submit it to your lecturer using the Case Report Submission link in the ICAP section from the home page.
Case-Based Learning – Online Environment

• Increased accessibility
  – Accessibility to the task

• Increased process-oriented approach to some aspects – overall case assessment!!

• Dramatically increased student engagement with pathology

• Inadvertently decreased process-oriented approach to microscopy
This is where students receive process-oriented approach to microscopy
Learning Environment

• The recent past
  – ResourceBuilder – case-based
    • Blended learning environment with activities using traditional tools (microscopes) being transformed to the online environment in a discovery process

This essentially went back to traditional microscopy but engaged the student in building an online case.

Problematic logistically with access to microscopes
Problematic with format of microscopy images in cases
Learning Environment

• Current
  – Lectures
The Lymph Node - Medulla
The Lymph Node - Medulla
Dear Mark,

Would you be able to take a look at slide 57 under neuropathology prac?

In some areas of the meninge, there are clusters of round pink things that I don't really know how to explain...intermingled with them are spherical spaces which have pink substances in them (are these axons?). I attached a snapshot of this.

Also many of the neurons look rather large with some basophilic speckled things inside...are these neurons undergoing degeneration?
Learning Environment

• Current – compulsory summative assessment tasks
  – Case-based learning  (retained as minor component)
    • (whole case online delivery including static histopathology images)
  – Virtual Microscopy
    • **INTERACTIVE** Microscopy
      – WRITE 3 PATHOLOGY REPORTS
        » Microscopic description
        » Interpretation
        • Morphological diagnosis
        • Comments on pathogenesis including aetiology

PROMOTED DISCOVERY PROCESS
1\textsuperscript{st} Task = all parasitic disease  
(ALTHOUGH I DIDN’T TELL THEM THAT)

STUDENTS ARE STRATEGIC
THEY CONSULTED WITH JAN ONCE THEY REALISED PARASITIC AETIOLOGY
Hi Mark,

Sorry, we have quite a few more questions with regards to our ICAP task 2A and hope you can help us out. Our group (1C) got the wallaby brain section. We managed to work out most of it already but just wanted to check if we are on the right track.

We think there is a meningioencephalitis in our section. There are clusters of infiltrative cells seen in the brain parenchyma but we aren't sure if those are pathologic in nature as they do not seem to be diffuse/widespread but instead clustered in small multifocal patches throughout the brain tissue. There are also similar infiltrative cells surrounding the vessels in the brain (perivascular cuffing). These infiltrative cells are mononuclear and really dense-staining and we were wondering if they are lymphocytes? But they do not seem really round so we are not sure. Would this pattern of infiltration/number of cells be sufficient to classify it as encephalitis? Or is it a part of the normal architecture?
We have found clusters of what we think are toxoplasma cysts but they do not seem to have inflammatory cells around them. Would that be due to them being in a latent phase? Or could the inflammation in the meninges and brain tissue (above) & around vessels be due to these toxoplasmosis cysts in wallabies? How do we differentiate histologically a patent/latent infection of toxoplasmosis in wallabies?
The next question might be a bit dumb. But we thought this (see below) looked a bit like a worm? Could it be somehow related to the cysts that we found above? But we only managed to find one of these. Or is all the parasitology getting to us? Haha.
Also, there is an area where the brain tissue appears to be paler and vacuolated. We saw a similar picture form the cornell website which indicated it was a spongy change due to artifact. Is that the case in our slide too? Or should we consider this as a necrotic/degenerative change of pathological significance?
DIRECT HORIZONTAL INTEGRATION

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A Further Example

• The following example illustrates how students ask confirmatory questions online rather than simple identification questions.

• The students assess the data, draw a conclusion and ask for input on their conclusion. This tool facilitates this learning approach.

• Virtual Microscopy allows face to face class time to focus on higher order learning
Hi Mark,

sorry, we have a few questions with regards to our ICAP task 2B. Our grp (1C) got the lung and lymph node section this time. We noticed that there were some vessels that were filled with pink vacuolated stuff, that look like bubbles. we were wondering if they are just RBC that are not stained properly?
and also, just to confirm, these large cells that have very vacuolated cytoplasm, we think they are giant macrophages (giant cells)

thanks mark, have a great easter!
Regards,
Conclusions

• Very successful implementation
• Promoted discovery process thereby engaging students
• Promoted horizontal integration
• Flexibility remarked upon by many students
• Has improved the capacity of students to engage in practical class activities
  – Has allowed them to quickly assess and then concentrate on the important things