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# Original Article

# Modified Myeloperoxidase Staining: An Alternative to the Sudan Black Stain

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## Abstract
As the strong carcinogenic properties of the traditional benzidine Myeloperoxidase (MPO) became known, the MPO fell out of favour and the non-carcinogenic Sudan Black B (SBB) stain became the stain of choice. Overseas trends are now back to the MPO stain in a modified form. We trialled several modified MPO stains and now routinely use the modified MPO in our diagnostic workup for leukaemia in place of the SBB stain.

## Key words
Acute leukaemia, Cytochemistry, Myeloperoxidase (MPO), Sudan Black B (SBB)

## Introduction
Peroxidase is a highly effective heme-containing enzyme found in the primary granules of the granulocytic series cells, and to a variable degree in the monocytic series. It is not present in cells of lymphoid origin. It is stained cytochemically with positivity visible in the cytoplasm.

Cytochemical staining of MPO activity plays a large role in the diagnosis of Acute Leukaemias. The French-American-British (FAB) criteria for classification of Acute Leukaemias was introduced in 1976 when few immunological markers of cell lineage were available. Diagnosis was made on morphology and cytochemistry with particular emphasis on the MPO stain. Greater than 3% MPO (or SBB) positive blasts is considered diagnostic of Acute Non Lymphoblastic Leukaemia (ANLL)(1).

Traditionally the carcinogenic benzidine stain was used to differentiate myeloid from non-myeloid cells. Over the years the non-carcinogenic SBB stain became the stain of choice in many laboratories, however as with most cytochemistries, the SBB has limitations. In our experience the SBB is not lineage specific (both myeloblasts and lymphoblasts may stain positively), stain reproducibility is unreliable, and resolution is often poor with smudgy stained reaction products. Overseas trends are now back to using the MPO stain in a modified form. For these reasons we trialled three different MPO cytochemistries.

## Materials and Methods
**Samples** Fresh bone marrow smear slides made from aspirate collected into EDTA anticoagulant were stained in parallel for both the MPO stain and the SBB stain.

A fresh peripheral blood control smear was included with each stain. (Neutrophils stain positively and lymphocytes negatively).

1. **Trial 1: 4-chloro-I-naphthol**(2,3).
   Fresh fixative was made by mixing 0.5 ml of 37% formaldehyde with 4.5 ml of absolute ethanol. The slides were fixed in this mixture for 60 seconds at room temperature, rinsed with tap water, and before drying out were placed in the following solution for IO minutes at room temperature. Two ml of 4-chloro-I-naphthol (Sigma C-8890) solution (0.4g / 50 ml absolute ethanol) was mixed with 38 ml of Tris- HCI buffer (0.05 M; pH: 7.4-7.6). To this 1 ml of diluted $H_20_2$ (0.4 ml 3% $H_20_2$ diluted to 10 ml with deionised water) was added. Counterstaining was with Leishmans stain.
2. **Trial 2: Sigma Kit p-Phenylenediamine**(4).
   Trizmal stock buffer was diluted as per kit instructions and warmed to 37°C. While the buffer was incubating, the slides were fixed for 30 seconds at room temperature with fresh fixative made with 0.5 ml 37% formaldehyde and 4.5 ml absolute ethanol, washed with tap water, and dried in a dark cupboard for I0 minutes. The slides were then immersed in the working reagent made as follows. One vial of kit peroxidase indicator (containing the active ingredient p-Phenylenediamine) was added to the warmed buffer along with 0.2 ml of 3 % $H_20_2$. The slides were incubated for 30 minutes at 37°C, washed for 30 seconds with water and counterstained with Acid Haematoxylin.
3. **Trial 3: 3,3' diaminobenzidine**(5).
   One ml of stock 3,3' DAB (containing 0.4g DAB diluted in Tris-HCI buffer) was further diluted to 50ml with Tris-HCI buffer (50 mmol/L, pH 7.6) and 0.2 ml of 3% $H_20_2$ added. The slides were fixed in cold buffered formalin / acetone (pH 6.6) for 30 seconds, then placed in the working DAB solution for 15 minutes at room temperature in the dark . After careful rinsing with water (refer to safety discussion later in this paper), the slides were counterstained with Leishmans stain.

## Results
The slides were examined for stain quality and compared with the Sudan Black stain in conjunction with the Immunophenotypic marker results. Each stain had advantages and disadvantages which are discussed below, however the 3,3' DAB method was found to be best overall.

1. **Trial 1: 4-chloro-I- naphthol**
   Plate I illustrates the blue-black reaction product seen in this stain. Unfortunately, there was variability in staining quality from batch to batch, and the reaction product dissolved when lacquered therefore affecting storage of stained slides.

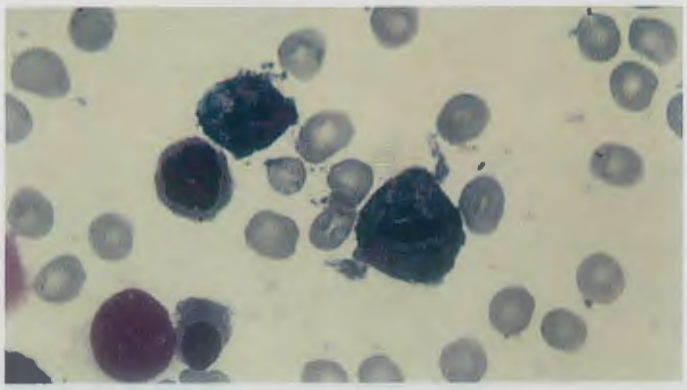

**Figure 1.**
4-chloro-I -naphthol stain illustrates the blue-black reaction product.

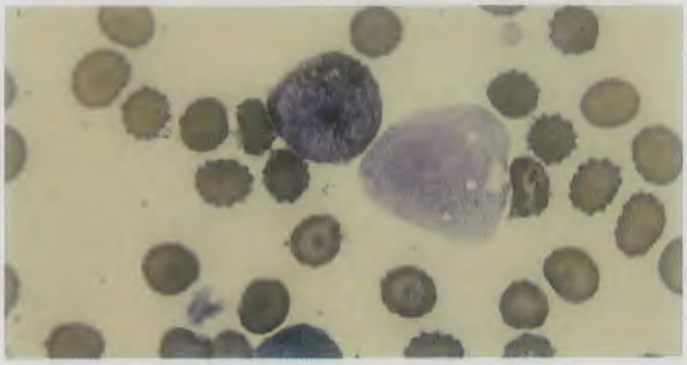

**Figure 2.**
The Sigma kit p-Phenylenediamine stains with a brown-black reaction product.

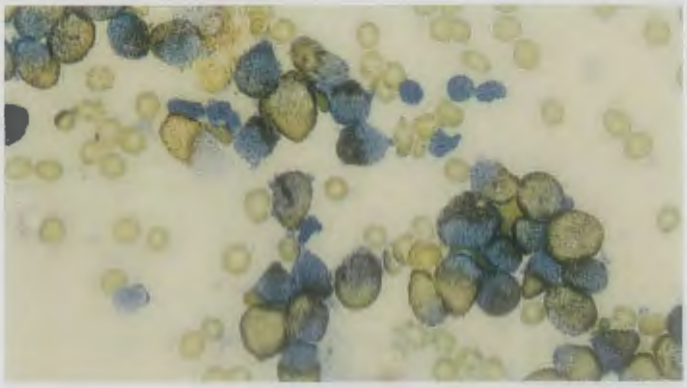

**Figure 3.**
The golden-brown granules of the 3,3' DAB stain are clearly visible in this photo.

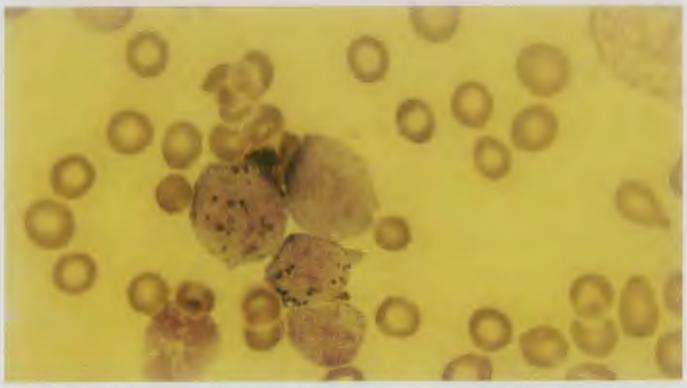

**Figure 4.**
The Sudan Black positivity is clearly visible in the lymphoblasts of this child with Acute Lymphoblastic Leukaetmia (ALL). The MPO stain was negative.

The advantages of this stain however, were the non-carcinogenicity of the substrate and it was quick and easy to perform compared to the SBB stain (only 20 minutes).

2. **Trial 2: Sigma Kit p-Phenylenediamine (390A)**

   Plate 2 illustrates the brown-black reaction product seen in this stain. This kitset was quick and easy to perform (30 minutes) and has been approved by the American safety authorities as an alternative to classical benzidine MPO.

   The kitset reagents kept exposure of the operator to p-Phenylenediamine to a minimum. Skin contact with this chemical has been described as harmful to target organs, and the chemical itself has a low flashpoint of 68°C which has storage implications.

   Although the kitset had small test numbers (10 tests per kit) and was expensive, it would probably be suitable for small laboratories with few requests for MPO stains per annum.

   Auer rods were not easily visible with this stain, and there was no consistency in staining quality from batch to batch, with resolution varying from smudgy to distinct granules, sometimes superimposed over the nucleus.

3. **Trial 3: 3,3'DAB**

   Plate 3 reveals the golden-brown reaction product seen with 3,3' DAB.

   This stain was quick and easy to perform (30 minutes), with a stable, strong reaction product. Auer rods were clearly visible. The stained product did not dissolve when lacquered.

## Discussion

All the MPO trial stains were lineage specific reacting positively with myeloid cells and negatively with lymphoid cells. Lineage was confirmed by immunophenotypic markers, and in I case by a SBB positive (MPO negative) Acute Lymphoblastic Leukaemia in this trial. Refer to Plate 4.

Of the three MPO stains, the 3,3' DAB substrate became our stain of choice. The 3,3' DAB stain is recommended by the International Committee for Standardisation in Haematology (ICSH)(5). It is sensitive, reproducible, quick and easy to perform, has a strong clear resolution product that is stable for storage, Auer rods are clearly visible, and is lineage specific allowing a quick and accurate diagnosis by the Haematologist. In contrast, the SBB stain is in our experience not lineage specific (reacting with both myeloid and lymphoid lineages), produces variable staining quality, as well as a prolonged incubation staining time.

There are of course limitations associated with any laboratory procedure and the 3,3' DAB MPO is no exception. Limitations are summarised below.

1. Unfixed slides at room temperature show a decline in MPO activity. Stain within a few days of collection(5).
2. MPO deficient cells (either acquired or defective) may not stain positive. In this setting, the Sudan Black B should be considered as a supplementary technique(5).
3. Safety. It is acknowledged that although the 3,3'DAB has reduced carcinogenicity it is still not without risks.

   Exposure of 3,3'DAB to chloride ions (as in 2% hypochlorite found in most laboratories) degrades the carcinogen to harmless non carcinogenic constituents that can then be flushed down the sink with copious amounts of water. All glassware, pipettes, gloves etc in contact with the 3,3' DAB are exposed to hypochlorite before disposal into hazardous waste bins.

## Conclusion

Although the ICSH recommended 3,3' DAB MPO stain has some limitations, in balance the advantages outweigh the disadvantages

compared with other MPO stains and the SBB stain, allowing a quick and accurate diagnosis of lineage by the Haematologist.


## Acknowlegements

Grateful thanks to the staff of Special Haematology laboratory, Auckland Hospital who assisted with this evaluation, Delwyn Spedding for her work on the 4-chloro-l-naphthol stain trial, and to Dr Rekha Thula (Haematologist) for her comments and careful evaluation of every slide in the trial.


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**Boehringer Mannheim Clinical Chemistry Award.**
Pictured is Clare Murphy, Quality Improvement Co-ordinator for Capital Coast Health Laboratory Services, accepting the award for the best clinical chemistry paper at the Annual Scientific Meeting of the NZIMLS, from John McKay, representative of Boehringer Mannheim.

Clare's paper was entitled 'Implementing the RHA draft national quality standards for medical testing laboratories for glucose near patient testing', and as a condition of the award, will be published in the Journal (March 1998).

# Original Article

# Viral Gastroenteritis Testing Capabilities of New Zealand Clinical Laboratories

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## Abstract

### Objective
Acute viral gastroenteritis is known to be a major cause of morbidity in New Zealand, although there is little information on its incidence. This study sought to gain information on current diagnostic testing capabilities and practices of medical laboratories in regard to viral causes of gastroenteritis.

### Methods
A mail questionnaire was sent to all 61 New Zealand clinical laboratories that test faecal specimens. Results of the 55 completed questionnaires returned were analysed.

### Results
Forty-eight laboratories advised that they tested for rotavirus under at least some circumstances. Ten laboratories reported testing for enteric adenoviruses, and only one tested for Norwalk viruses. No laboratories tested for caliciviruses or astroviruses. Testing methods for viruses were generally appropriate.

The responses of laboratories to potential outbreak situations were very variable. However, daycare situations, hospitals, and nursing homes would elicit the greatest response in terms of a search for a viral agent.

### Conclusions
Overall, laboratory capability to test for viral agents of gastroenteritis was very limited in New Zealand. Therefore, many viral gastroenteric illnesses are likely to go undiagnosed, and outbreaks undetected. Guidelines for laboratory testing of diarrhoea specimens in potential outbreak situations would be useful.

## Key words
Gastroenteritis, viral agents, New Zealand, clinical laboratories.

## Introduction
It has been estimated that in the United States up to 40% of the cases of infectious gastroenteritis are due to viruses(1). Although the situation might be assumed to be similar in New Zealand, there are no data to confirm or refute this speculation. Good data on the incidence of viral gastroenteric disease is dependent on laboratory identification of viruses in stool samples. This survey sought mainly to obtain information on the capabilities of medical testing laboratories to identify viral organisms in referred faecal specimens. A related survey - on the stool specimen referral practices of New Zealand general practitioners - will be published separately(2).

The objectives of this survey were:

- to determine the current diagnostic testing capabilities and practices of medical laboratories in regard to viral causes of gastroenteritis;
- to determine methods used in laboratory testing for gastroenteric viral agents;
- to determine laboratory responses to gastroenteric illness outbreak situations that potentially involved viral agents.

## Methods
A questionnaire asking about five types of virus that are major causative viral agents for gastroenteritis (rotaviruses, Norwalk or Norwalk-like viruses, enteric adenoviruses, caliciviruses, and astroviruses) was sent to all New Zealand clinical laboratories that test faecal specimens. Laboratories that did not return the questionnaire within the specified time frame were sent a reminder letter, if necessary followed up by a telephone call. The data from completed questionnaires were double entered into a database.

## Results
Of the 61 laboratories contacted, 57 returned questionnaires. Of those questionnaires, one was incomplete and the data provided were contradictory. Excluding this questionnaire gave us an overall response rate for satisfactorily-completed questionnaires of 91.8 %. A laboratory that reported that it did not receive faecal specimens was excluded from the analysis. The remainder of this report refers to the other 55 laboratories.

Forty-eight (87.3 %) laboratories reported that they had the

capability to test for rotavirus. Of these, two laboratories tested all diarrhoeal specimens for rotavirus. Thirty-seven laboratories tested routinely for rotavirus in infants and children. Of the other nine laboratories that test for rotavirus, six said they tested for it on specific request only, and three would test for it depending on clinical signs and symptoms.

Only 10 (18.2%) laboratories reported that they tested for enteric adenoviruses. Of these, one tested for it routinely on all stool specimens, four tested for it routinely in infants and children (with one of these commenting that they also tested for it on request for 'general virology'), three tested for it on specific request only, and two tested for it only on request for 'general virology'.

Only one laboratory reported testing for Norwalk and Norwalk-like viruses (referred to below as 'Norwalk virus'), and only according to clinical signs and symptoms.

No laboratories reported testing for either calicivirus or astrovirus.

Forty-six laboratories reported that under some circumstances they referred faecal specimens to other laboratories. Nine laboratories said they did not refer specimens, and one laboratory did not answer the question.

Table 1 summarises methods laboratories reported using to test for viruses.

To ascertain how laboratories would respond to specific gastroenteritis outbreak situations that could involve viral causes, we asked laboratories about the viruses for which they would test in a number of hypothetical situations, even if a clinician had not specifically requested viral testing. Twenty-three laboratories (41.1%) said they would not in any circumstances test or refer specimens for testing without being requested to do so by a clinician or a public health officer. The responses from the other 32 laboratories are summarised in table 2. The responses were variable but potential outbreaks in hospitals, daycare centres and nursing homes were most likely to lead to testing for a possible viral cause.

**Table 1:** Methods used by laboratories for testing for enteric viruses

| | Latex agglut. | EIA | EM or IEM | PCR | Cell culture | Not specified | Total |
|---|---|---|---|---|---|---|---|
| Rotavirus | 37 | 5 | 2 | — | — | 3 | 47 |
| Enteric adenovirus | 4 | — | 2 | — | 2 | 2 | 10 |
| Norwalk virus | — | — | — | 1* | — | — | 1 |
| Calicivirus | — | — | — | — | — | — | 0 |
| Astrovirus | — | — | — | — | — | — | 0 |

**Key:** Latex agglut = latex agglutination, EIA= enzyme immunoassay, EM= electron microscopy, IEM= immune electron microscopy, PCR= polymerase chain reaction

*Two further laboratories stated that PCR for Norwalk virus was under development

**Table 2:** Numbers of laboratories testing for viruses or referring to other laboratories for Viral testing in specified possible outbreak situations

| Possible outbreak situation | RV | EV | NV | RV/ NV | RV/ EV | EV/ NV | RV/ EV/ NV | Gen Viro |
|---|---|---|---|---|---|---|---|---|
| Hospital outbreak | 5 | 1 | 2 | 1 | 2 | — | 2 | 9 |
| Daycare outbreak | 16 | — | — | — | 3 | — | 1 | 7 |
| Nursing home outbreak | 8 | 1 | — | — | 2 | — | 1 | 10 |
| Secondary school outbreak | 2 | — | — | — | 2 | 1 | — | 9 |
| Foodborne outbreak | — | — | 5 | — | — | — | — | 9 |
| Family outbreak | 3 | — | — | — | 2 | 1 | — | 6 |
| Recent shellfish consumption | — | — | 2 | — | — | — | — | 8 |

**Key:** RV= rotavirus, EV= enteric adenovirus, NV= Norwalk virus, Gen Viro= general virology.

## Discussion

The laboratory examination of faeces for the cause of infectious diarrhoea has been stated to be among the most laborious and least cost-effective testing that takes place in the clinical laboratory, with a typical rate of recovery of pathogens from routine bacterial stool cultures in most laboratories of less than 10%(3). That is even more of an issue for viral enteric pathogens. Viral particles are shed intermittently, and numbers in stools often decrease rapidly after the first 48 hours of illness. Diagnostic tests can be expensive and require specialist equipment or technologies not available in most clinical laboratories. Also, treatment will often need to be initiated before results are available.

The reliance on laboratory diagnosis of viral gastroentefitis will, therefore, underestimate the size of the problem. However, laboratory confirmation is likely to be useful in tracing sources of outbreaks, such as one caused by a Norwalk-like virus, traced to oyster consumption, in Northland recently(4,5). However, prior to this survey there was little information on the capabilities of New Zealand laboratories to diagnose viral pathogens in routine faecal specimens.

Although completed questionnaires were not obtained from a few laboratories, the high response rate means that our results give a good picture of the viral testing capabilities of New Zealand clinical laboratories. One caveat should be added. There is the possibility that, in some cases, questionnaires were completed by individuals with a less than complete understanding of their laboratory's capabilities and procedures. If this occurred then it would have introduced errors into our results.

Although most laboratories had the capability to test for rotavirus, only ten laboratories could test for enteric adenovirus, and only one could test for Norwalk viruses. No laboratory reported the capability to test for either caliciviruses or astroviruses. In a separate survey we have shown that patients with viral gastorenteric illness are not likely to have stool samples referred to laboratories for testing(2). Taking these considerations into account, it is not surprising that that there is no reliable information on viruses as causative agents of gastroenteric illness in this country.

The limited extent of gastroenteric viral testing capabilities of laboratories in this country is of concern. The capability to detect viral agents in faecal specimens is important for several public health

reasons: to identify sources of contaminated food and water, to prevent spread of viral agents by persons in high risk occupations (eg, food handling, or work in child care or health care institutions), and to support outbreak investigation generally.

We were particularly interested in the response of laboratories to possible gastroenteric disease outbreaks, especially outbreaks in institutions, since outbreaks have the most potential for large scale illness and economic damage. Outbreaks are also situations where sources of infection are potentially most amenable to identification (through a combination of laboratory and epidermiologic means) and control.

Laboratories reported that they responded in varying ways to potential outbreak situations. Perhaps not surprisingly, given current funding arrangements for diagnostic testing, almost half of the laboratories indicated that they would neither test for viral agents nor would they refer specimens for such testing unless specifically asked to do so by responsible clinicians or public health workers.

The outbreak scenarios specified in the questionnaire were all ones that may be associated with viral outbreaks. Responses to the questionnaire reflected a reasonably widespread knowledge of this, although there was a great deal of variation (Table 2). For example, twenty laboratories indicated that they would specifically look for rotavirus (and sometimes other viruses) in a daycare outbreak, and a further seven would do 'general virology' in this situation. Potential nursing home and hospital outbreaks were the other two situations where an appreciable number (22/55) of laboratories indicated that they would seek a viral agent. However, again, the response was variable in terms of viral agents sought and many labs would refer for 'general virology'. This term appears to have no generally-accepted meaning, even when restricted to faecal testing.

Norwalk viruses have been associated with all of these outbreak situations. In other countries Norwalk viruses are one of the most common causes of foodbome viral illnesses(6). There have been recent New Zealand outbreaks associated with oysters(4,5). However, few laboratories mentioned that they would seek this virus in outbreak situations. This may be a function of the lack of Norwalk virus testing capability in this country, or a lack of awareness that the testing capability exists. All specimens would need to be referred to the one New Zealand laboratory that can detect Norwalk viruses.

Illnesses caused by caliciviruses usually occur in infants and young children, but can spread to adults. These viruses have been associated with shellfish ingestion and with outbreaks in hospitals and schools(1). Astroviral illnesses are also more common in children, but have been responsible for nursing home outbreaks(1). Not surprisingly, given the lack of an appropriate testing facility in New Zealand, these viruses were not sought by any laboratories as a matter of course in the outbreak scenarios listed in the questionnaire.

## Conclusions

Our results show that laboratory testing capability for viral causes of gastroenteritis in New Zealand is severely limited, and for some viruses non-existent. It follows that viral gastroenteric illness will frequently go undiagnosed, even when a specimen is referred to a testing laboratory. AJthough most viral gastroenteric illnesses are relatively mild and of limited duration, the viruses are highly infectious and their impact can be large in outbreak situations.

In our view the capability to test for astroviruses and caliciviruses should be established in at least one New Zealand clinical testing laboratory. Also, we believe that it would be desireable for guidelines to be established for laboratory testing of diarrhoeal specimens in potential outbreak situations. Such situations would include sick individuals identified as working in high risk occupations (eg, food handling, health care and child care industries). To be of most value, the guidelines would cover bacterial, viral, and protozoal causes of illnesses. The guidelines would also include advice on when to contact appropriate staff of public health units in the event of an outbreak being detected or suspected, and when specimens should be referred to another specialised laboratory for further testing.


## Acknowledgements

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# Original Article

# Trichostrongyliasis — A New Zealand Case.

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## Abstract

Trichostrongyliasis,a zoonosis in New Zealand may cause gastrointestinal symptoms and a blood eosinophilia. A recent case is described along with a brief review of the causative parasite. In most cases, human disease is not serious but diagnostic difficulties may arise, as the trichostrongyle eggs resemble those of hookworm.

## Key words

*Trichostrongylus* spp, Trichostrongyliasis, zoonosis, New Zealand.

## Case report

A 54 yr old female was generally unwell. Because of her rural lifestyle and close animal contact her vet recommended she visit her general practictioner for a medical check up. A faeces sample was submitted to the laboratory for routine culture and parasite examination.

No bacterial pathogens were isolated. However, examination of a formalin-ethyl acetate concentration(1) showed the presence of large (90-95µm x45-50µm), thin shelled, oval ova, tapered at one end, consistent with eggs of *Trichostrongylus* Spp(2). This initial identification was confirmed by Associate Professor J Andrews, Department of Biological Sciences,Victoria University as *Trichostrongylus* spp.

Examination of a second faeces sample also revealed the presence of *Trichostrongylus* ova. All haematological test results were within normal limits, the eosinophil count being 2% (absolute count $0.1x10^9$/L). Treatment with pyrantel embonate or mebendazole was recommended. No further specimens were received from the patient nor any other family members.

Cultures for filariform larvae and animal innoculation were not performed (the male adult worm is required to enable species differentiation) so identification was only to genus level.

## Discussion

*Trichostrongylus* spp have been shown to exist as long ago as 1250 AD. Examination of coprolites (desiccated faeces) excavated from the archaelogical site of the Anasazi in Arizona, revealed the presence of *Trichostrongylus* eggs. It is thought that diet and the lifestyle of foraging for food exposed the Anasazi agriculturalists to this helminth(3).

*Trichostrongylus* is found throughout the world, particularly in rural areas where herbivorous animals are raised. However human infections appear to be most frequent in the Middle and Far East(4). A study of world incidence reported 70% of a group of labourers in Southern Iraq to be infected and in Japan and Korea the range of incidence varied from 1% in some regions to over 82% in others(5). A study of the incidence of *Trichostrongylus* axei in sheep abomasa (fourth stomach) in New Zealand showed seasonal fluctuations. The highest incidence was recorded in late autumn and winter.Variation in the geographical distribution was also noted. The highest incidence was recorded in samples from central and southern districts of the North Island and west and northern districts of the South Island. The cool, moist conditions in central New Zealand provide optimal conditions for the development of the species(6).

There are more than 32 species of which 10 have been reported in human infections, (7) *T axei* being one of the species implicated in man. Studies in Iran show human infections to be zoonotic except for those of *T orientalis* which is found most commonly in Japan, Korea, China and Taiwan, and is transmitted primarily from human to humani(4).

The adult worms are slender,reddish-brown,5-10mm in length and have no distinct buccal capsule. They live with their heads embedded in the small intestinal epithelium. The species can be identified and differentiated by the form and shape of the posterior copulatory spicules of the male. The different species cannot be distinguished from the eggs alonei(4).

The eggs (75-95µm x 40-50µm) resemble those of hookworm, have colourless thin shells and are tapered at one or both ends. The inner vitelline membrane around the ovum is often wrinkled at the pointed end and the germinal mass does not fill the shell(2). The eggs are very resistant to drying,cold and immersion in water. Under suitable conditions freshly voided ova hatch in the soil in about 24 hrs.

The third stage infective semi-filariform larvae develop in about 60hrs. They are very resistant to cold and dessication, but are susceptible to high temperatures and rapid evaporation ratesy(4). The juveniles require grasses or other ground cover vegetation in moist, shady areas of high humidity for migration. When the temperature is high and the humidity low, 10 days exposure is lethal for infective stages. In contrast, hookworm juveniles are able to survive in relatively dry conditions and in the absence of vegetation(5).

Man is usually an incidental host with infection more common in people who have close contact with animals eg sheep, goats, deer, rabbits. He usually becomes infected by eating raw plants or chewing grass contaminated with infectious larvae. It is not thought that the larvae are capable of invading skin. Unlike hookworm, migration through the lungs is not required to complete the life cycle. The larvae are swallowed,reach the small intestine, attach to the mucosa, undergo two moults and become sexually mature in 25 days. Experimental infections have shown *Trichostrongylus* spp capable of persisting in vivo for as long as 8 years. This suggests there is little acquired immunity. The natural resistance of man to *Trichostrongylus* spp varies from being very susceptible to *T orientalis* and less susceptible to *T axei*.(4).

Diagnosis of infection with *Trichostrongylus* spp is confirmed by the presence of trichostrongyle eggs in the faeces. Larvae may be recovered from the faeces but must be differentiated from those of

*Strongyloides* spp. Identification of the species requires the innoculation of susceptible animals with the cultivated larvae. The adult worms are then recovered and identified. Generally infections are light with mild or no clinical symptoms. In light infections the eosinophil count is often normal. However a significant and persistent eosinophilia may occur in heavy infestations and is often the only indication of *Trichostrongyliasis*(4). In the presence of hundreds of worms, clinical symptoms may be experienced from epigastric distress,diarrhoea and gas, to headache, fatigue, bleeding from ulceration as the worms attach to the intestinal mucosa,dry skin leading to desquamation, anaemia, polyarthralgia and emaciation(4,7).

Infections may be missed because patients are asymptomatic, have only mild gastrointestinal symptoms,have only a mild eosinophilia or the eggs are mistakenly identified as hookworm eggs. Examination for faecal parasites may be indicated when patients have an eosinophilia with no other obvious cause. Treatment of a light asymptomatic infection may not be necessary except to eliminate the cause or potential cause of an otherwise unexplained eosinophilia. Heavy infections may be treated in New Zealand with pyrantel embonate (combantrim) or mebendazole (vermox).

Trichostrongyliasis may be more common in New Zealand than represented by reported cases due to the asymptomatic nature of many cases and the possibility of the eggs being mistakenly identified as hookworm Laboratories need to be aware of the presence of *Trichostrongylus* spp in New Zealand and be able to differentiate it from hookworm as the modes of transmission differ, along with the management, treatment and advice regarding prevention(7). Hookworm infections generally imply poor hygiene and unsanitary conditions whereas *Trichostrongylus* infections are usually zoonotic. Because *Trichostrongylus* is much more resistant to treatment than hookworm, misidentification can lead to unnecessary, prolonged and unsuccessful treatment(5).

Effective prophylaxis involves thorough washing and cooking of contaminated vegetables, preventing the use of infected animal faeces as manure, treatment of infected herds and even soil fumigation in areas with heavy infestation(4).

## Acknowledgements

The author wishes to thank Dr K Wood,Valley Diagnostic Laboratories, for the literature search, and Associate Professor J Andrews, Victoria University, for confirming the presumptive identification.

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# Transfusion Science

Special Interest Group

**TSSIG Members**

Geoff Herd, Sue Baird, Ray Scott, Christine van Tilburg, Holly Perry, Simon Benson, Andrew Mills, Sheryl Khull, Raewyn Clark, Tony Morgan, Diane Whitehead, Suzanne Williams, Les Milligan.

## A Review of the NZIMLS ASM in Wellington August 1997

I was fortunate to attend this years ASM in Wellington and have been asked to give TSSIG members a brief overview of the sessions I attended.

**Thursday 28th August**

For the first time the ASM offered a Bone Marrow and Peripheral Blood Stem Cell Forum. As part of my work involves the processing of these harvests I was keen to find out what is happening around the country.

The session opened with an overview of Bone Marrow Transplantation encompassing the selection, technique and results achieved.

John Dagger then gave us an insight into the HLA system, the testing involved and problems that are encountered with donor selection. This was then expanded on by Zlatibor Velickovic who led us into the complex world of molecular biology, bringing us up to date with the use of Sequence Based Typing and its value in identifying polymorphisms.

The structure and activities of the New Zealand Bone Marrow Donor Registry was next on the agenda, outlining the need for such an Organisation, with its links to the rest of the world.

Jane Humble discussed the problems arising with CMV infection in post transplant patients and described the difficulty in finding an appropriate assay to identify acute/ reactivated CMV infection.

This was followed by Dr Humble who described the infection hazards that arise post transplant and the effect on recovery.

Dr. Ken Romeril spoke on the selection, stimulation harvesting and efficacy of Peripheral Blood Stem Cell Transplantation, including the expanding use of PBSCT in solid tumour treatment, cell selection and expansion ex-vivo, gene therapy and the use of Interleukins to stimulate cell production.

The role of the Molecular Haematology Laboratory in analysing and interpreting haematopoietic progenitor cells, including the beginners guide to flow cytometry was presented by Jan Nelson.

This naturally flowed on to a description of the harvesting, cryopreservation, thawing and infusion of stem cells. It is always interesting to see how other centres do things.

A look at transplantation from the nursing point of view, one we rarely get to see in the laboratories proved enlightening, and Lesley McCulloch's survey of the patients experience of transplantation added yet another dimension to the subject.

Dr. Chris Hogan discussed the provision of specialist blood products as support for transplantation protocols.

After lunch I presented a case history of Wiskott-Aldrich Syndrome successfully treated with a Cord Blood Stem Cell transplant, Carole Watson described the trials and tribulations of importing the harvest from New York, and the thaw protocol used.

David Harte from the ESR spoke of his work on Hepatitis G, its disease significance and implications.

The detection and elimination of Yersinia enterocolitica from our donor population is an ongoing problem. Chis Kendrick bought us up to date on the work being done at Massey University using antibody screening to detect current infections.

To conclude the Transfusion Science forum Grant Storie from the Ministry of Health gave an overview of the directions he foresaw the industry taking, Kathryn Hope from CSL Australia described the Plasma Processing outlook and Walter Wilson of the NZ Blood Service Trust presented his vision for blood transfusion in the future. These presentations were followed by a panel discussion regarding the practise of Transfusion Science and the challenges we face for the future years. No hard information was given concerning the restructuring of the service, we have to just wait and see.

**Friday 29th August**

A selection of workshops were available, I chose to attend Performance Appraisal and then How To Give an Effective Presentation, both of which were interesting. Having just undergone the rigours of giving a presentation I found Jill Forgies talk full of handy hints and wished I could have had the benefit of her wisdom a few days earlier.

As always the trade stands were well presented, the latest technology there to view and, of course, the social functions just what was needed to revive one after a hard day straining the brain.

The last TSSIG meeting was at Wairaki at the NICE weekend which, so I have heard, was the success we've all come to expect. I would like to thank Sheryl Khull and Christine van Tilburg for all their efforts.

A couple of changes occurred at that TSSIG meeting — Sheryl stood down as convenor and we gained some new members. Sheryl has worked very hard for Transfusion Medicine in her time as TSSIG convenor and I want to thank her for all her efforts. In fact her shoes have been so big to fill its taken two people. Geoff Herd – Whangarei and Sue Baird – Invercargill, have taken on the role as c0-convenors. Thank goodness we live in modern times and technology makes the distances small — you couldn't get two blood banks further apart.

I would also like to welcome our new TSSIG members — many hands make light work — (we hope) this will be a busy year for Transfusion Medicine, July 1998 is not far away. We all want to make the transition to a National body a successful one for all concerned.

The TSSIG submitted a proposal to the Ministry of Health offering our expertise, in the hope that we will be part of the working group set up to co-ordinate the change to the new National body. We believe our involvement will help ensure that the interests of the industry as a whole are taken into account.

The next TSSIG meeting will be held at the Conjoint Annual Scientific HSA/NZSH/ASBT meeting in Auckland (October 12-15th). Time, date, venue and agenda to be advised.

Any agenda items can be faxed to: Geoff Herd (09) 430 4136 or Sue Baird (03) 214 7200.

# *NICE WEEKEND*

## 8-10 May 1998
## A Transfusion Science education opportunity organised by the TSSIG

## Please register me for the 1998 NICE Weekend

| | |
|---|---|
| Surname: | First Name: |
| Address: | |
| Address: | |
| Address: | |
| Phone: | |

Paper or Poster: (circle) Title:

**A brief abstract of your presentation must be forwarded by 17 April 1998.**

| | |
|---|---|
| I have attended the NICE Weekend | times before. |

| | | |
|---|---|---|
| Registration Fee | -$230 | |
| or f**or NZIMLS** members | -$200 | $ |
| Either: Private Room surcharge | -$120 | |
| or: Accompanying Person Surcharge | -$190 | $ |
| Late Registration Fee (payable after 17 April) | -$150 | $ |
| **I enclose a cheque, made out to 'NICE WEEKEND' for the amount of:** | | $ |

Applications received after Friday 17 April 1998 can only be accepted if accompanied by the late registration Fee.

The Private Room Surcharge is payable only if you wish to have a room to yourself.

The Accompanying Person Surcharge is payable only if you wish to bring an accompanying person who is not registering as a NICE Weekend delegate.

Signature:

**Please send form and cheque to Sheryl Khull, Transfusion Medicine, Palmerston North Hospital, Private Bag, Palmerston North, before 17 April 1998.**

**Haematology Self Assessment Journal Reading for MOLS Questionaire prepared by HSIG using a true/false format**
**Rreference Article:**
**Topic: Molecular Mechanism and Classification of von Willebrand Disease**
**Authors: Sadler, Matsushita, Dong, Tuley and Westfield**
**Journal: Thrombosis and Haemostasis Jul 1995 74(1) p 161-6**

Please circle your choice of correct answer

1. Nearly a hundred mutations of vWD have been described — True False
2. Specific mutations do not correlate to distinct vWB phenotypes — True False
3. Type 1 vWD is partial quantitative deficiency of vWF — True False
4. Type 2 vWD is a qualitative deficiency of vWF — True False
5. Type 3 vWD is rarely a complete deficiency of vWF — True False
6. Type 3 vWD is an autosomal dominant disorder — True False
7. Type 3 vWD has essentially no vWF in plasma or platelets — True False
8. Homozygous Type 3 vWD are predisposed to alloantibody inhibitors — True False
9. Type 3 vWD is caused most uncommonly by gene deletions but also by nonsense and frameshift mutations — True False
10. vWF stabilises factor V111 in the circulation and it mediates the adhesion of platelets to sites of injury — True False
11. Stabilisation of factor V111 requires a functional binding site for factor V111 on the vWF subunit — True False
12. Normal platelet adhesion requires a functional binding site on vWF for glycoprotein 1b(GP1b) — True False
13. Normal platelet adhesion is independent of the assembly of vWF into high molecular weight multimers — True False
14. Normal platelet adhesion requires normal regulation of connective tissue at the site of adhesion — True False

15. Defects in vWD that interfere with stabilisation of factor V111, normal platelet adhesion or defective regulation at the site of adhesion result in Type 2 vWD True False
16. Type 2N vWD refers to quantitative variants with markedly decreased affinity for factor V111 True False
17. vWD type 2N may be misdiagnosed as a haemophilia carrier True False
18. 2M vWD refers to qualitative variants with decreased platelet dependent function that is caused by the absence of high molecular weight multimers True False
19. Binding of vWF to sites of injury activates the GP1b binding sites in the vWF A1 domain allowing the adhesion of platelets True False
20. Two missense mutations within vWD A1 are known to cause vWD type 2M True False
21. The A1 domain allows stabilisation of the connective tissue site True False
22. Type 2A mutations involve any mechanism that decreases the concentration of large multimers as this will impair vWF function True False
23. The absence of large vWF multimers means the vWF has decreased platelet dependent function True False
24. Type 2A mutations may cause the absence of large multimers or may interfere with the assembly of large multimers True False
25. Type 2A mutations may inhibit the rapid disappearance of large multimers from the circulation True False
26. Multimer formation occurs in the nuclear apparatus True False
27. Type 2B vWD refers to qualitative variants with increased affinity for platelet GP1b True False
28. Type 2B vWD causes bleeding not thrombosis True False
29. All mutations known to cause vWD type 2B are within the A1 domain of the vWF subunit True False
30. Increased affinity of vWF for GP1b is thought to be due to the inactivation of an inhibitory domain True False
31. Type 1 vWD refers to total quantitative deficiency of vWF True False
32. vWD type 1 is the most common form of vWD True False
33. vWD type 1 can be difficult to identify consistently so misdiagnosis is a constant hazard True False
34. ABO blood type is a major genetic determinant of plasma vWF antigen levels with the normal range of people with blood type 0 20-30% lower than other blood groups True False
35. Some patients who are thought to be Type 1 may belong to the lower end of the normal distribution of plasma vWF levels for their blood type True False
36. Type 1 vWD can also be caused by deletion, frameshift and nonsense mutations as in Type 2 vWD True False

*If you are unable to obtain a copy you may contact me for one*
*Lee Glogoski*
*Ph. 09 276 0167 ext 8540*
*Fax. 09 270 4706*

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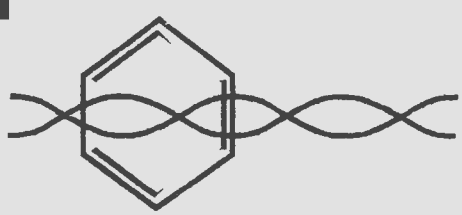
# Biochemistry

## Special Interest Group


Convenor: Alison Buchanan
Clinical Biochemistry
Main Building
Auckland Hospital
Ph: (09) 307 4949
Ext: 7553
Fax: (09) 307 4939

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*Dept of Clinical Biochemistry,*
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Thank you for the response to the last publication. All offers of help are appreciated.

At a recent breakfast meeting I attended, the invited speaker was from the corporate sector. 10 Golden Rules for success were outlined and I want to share them with you.

1. Adopt 'No Problem' as your motto
2. Remember your "shop front" - dress up, not down
3. Maximise your advantages
4. The boss is the boss, is the boss
5. Always show loyalty
6. Be innovative
7. Remember to have fun
8. Take responsibility for your mistakes
9. Adjust to change
10. Don't let your job be everything

I thought about how these Golden Rules could be applied in a laboratory setting. Some may be more difficult than others, but all of the rules can be applied.

Which ones can you relate to?

The Golden Rule that is relevant to many healthcare workers is No.9 - "Adjust to Change".

In the changing climate of the health sector, who has been untouched by change? This may have been on a small scale or on a scale that dramatically changes the work environment.

How have you handled the changes that have happened to you? Did you open your mind to the changes or did you "close ranks" and resist it?

Change for the sake of change can be detrimental, but change for the better can be an exciting challenge. Organisations need to grow to survive and change is part of the growth.

Change has even touched the Biochemistry Special Interest Group. As the responsibilities of the members of this group have changed, so too has the availability of their time to perform the functions of the Special Interest Group. The present convenor is one such person. Alison Buchanan has put in a number of years in this role. Her new responsibilities are taking most of her time and energy. She feels it is time for some 'New Blood' to take on this role.

The opportunities are there for interested biochemists anywhere in the country to take over the running of this group, to add new ideas, new life and new energy to Biochemistry in New Zealand.

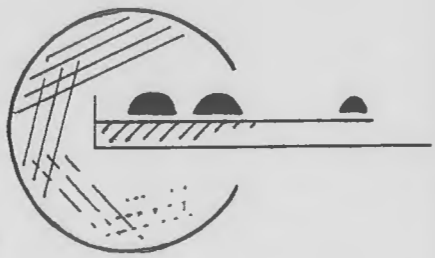
Do you have what it takes to meet the challenge?

*Lesley Stewart*
*Clinical Chemistry*
*Auckland Hospital*

# Microbiology

## Special Interest Group

**Convenor: Jan Deroles - Main**
**Contact Address: Medical Diagnostics**
**Palmerston North**



**Committee**

**Convenor**
Jan Deroles-Main — Medlab Central, P.O. Box 293, Palmerston North

Jenni Dowling — Diagnostic Laboratory, Auckland
Brian Hancock — Pathlab Waikato, Hamilton
Tom Henderson — Medlab South, Christchurch

**Secretary**
Sandy Newton — Diagnostic Laboratory, Auckland

**Treasurer**
Janet Wilson — Southern Community Laboratories, Dunedin

## 1998
## MSIG Seminar
## 14th March
## Flockhouse, Bulls

Write this date in your diaries and start writing those talks as the date has been confirmed as 14th March, 1998. You can't say that you haven't had enough warning.

The seminar is to be held at Flockhouse, a convention centre just out of Bulls (about 30 minutes from Palmerston North). All facilities are on site including heated indoor swimming pool, squash, tennis and basketball courts. Accommodation ranges from the super-thrifty to the luxurious and transport is available from Palmerston North airport if required.

The programme this year will start off as previous years with informal talks from the registrants (that is you). The afternoon format will change to sessions on a particular topic. These will probably be:

Enteric Pathogens
Seminal Fluids
Susceptibility Testing

The seminar dinner will follow soon after which, after much discussion, is included in the one off registration fee.

Registration forms should have been sent by the time this has been published. If you have not received one please contact Jan Deroles-Main (details above).


## Pacific Profile

Leading Pacific figures in the field of medical laboratory science will be featured in the future issues of the Pacific Way column of the NZIMLS Journal. This issue we begin with:

Name: Wilson Kikolo

Present Position: Head of Pathology Services
National Referral Hospital
Honiara
Solomon Islands.

Training and Qualifications: Diploma in Medical Technology
College of Allied Health Sciences
Papua New Guinea.

Previous employment: Solomon Islands Government
Honiara Diagnostic Laboratory

Main interests in laboratory work: In all, working in the Pathology Laboratory is very interesting and exciting because with the progress in science the laboratory has to continually update its thinking and techniques. The sections that I am most interested in are microbiology and biochemistry.

Highlight of my career: The highlight of my career was my appointment as Head of Pathology Services I had worked for eighteen years as a Junior Technician and Technician before taking the charge position and I hope to be able to work towards obtaining better recognition of the laboratory and the quality of the staff.

What are the main issues facing medical technology in the Solomons: A major issue is the need to improve the conditions of service for laboratory staff as at the moment they are unattractive compared to other professional colleagues both here in the Solomons and in the neighbouring Pacific countries. The continuing education for staff is a major factor in motivating staff to perform at higher professional levels. I see this as part of my determination to raise the level of quality management of the laboratory.

**Fiji Medical Laboratory Technologists Association**
**12th Annual Seminar – Suva**
**1/9/95 - 3/9/95**
**Theme: 'Challenge for the Future'.**
**Topic: Better Human Relations – Better Services.**
**Presented by: Mrs Berenadeta Lutua (Diploma in MLT, FSM)**
**Labasa Hospital, Labasa, Fiji.**

Today, I'd like to remind us all, that, in any modern hospital organisation, we are one of its most valuable assets — especially if properly trained, and experienced.

We are part of the manpower, and, we make up the most important of the five Ms on which the performance of any organisation is so much dependent on.

Despite the provision of the proper Material, enough Money, the best Method and sophisticated Machinery, Manpower holds the key, and without it, all else can be ruined or wasted.

On the other hand, having manpower without reaching the common goal of providing the best service, is also, a waste.

In addition to this, let's bear in mind that even though all our technical expertise and knowledge is required for good patient care, we have to interact with so many other humans to achieve our objective of providing the best service for the patient.

Therefore, we cannot deny that technical expertise alone will not be sufficient. It has to go hand-in-hand with a great sense of humanity and good human relations.

Let's take a closer look at what human relation is all about.

Firstly, it's concerned with people, and secondly, it's divided into industrial relations (between employer and employee) and the one we are more concerned with today, known as public relations. Public relations deals with how we relate to others and how others see us, and for it to be successful, the importance of effective communication cannot be stressed any further.

Also, no human activity is so constant and important as the act of communicating, and quite literally, life is made up of one communicative act after another. Yet, for most of us, our training in communication may not be enough to make us effective communicators. This can be proved by how often we badly use words (which are the tools of communication) resulting in bad human relations or destroying a relationship altogether.

Nevertheless, the following should initiate us to improve on our communication skills. Commonsense, our ability to learn and improve ourselves, concern for the patient and bearing in mind that no matter how busy one may be, with good human relations, that person may still go out of his or her way to be of help to you.

Therefore, it is very important to have good communication skills. And, at the heart of any communication amongst human beings, we have — behaviour.

Also, the right behaviour's very important, and an important one I'd like to share with you today is, behaving assertively. A person who behaves in an assertive way tends to feel confident and has a positive attitude towards others. He regards everyone as having equal value, therefore, respects all equally. The person also clearly understands that each person is an individual, who's unique, and needs to be treated with patience and understanding.

Moreover, acquiring communication skills, or becoming effective communicators require repeated practice. And, mastering

this specific behaviour and making it part of our own day-do-day communication would be a challenge in our role as technologists. This is especially so considering the very specific and technical nature of our work, whereby, we have to constantly provide timely and accurate test results for the doctors, to deliver good patient care. And, having to do this daily, is no easy task, especially, being an organisation man, whose life is controlled by time, and is always racing against it.

Nevertheless, for most of us, even though it may sound difficult, our ability to learn and be further developed will assist us to be patient, show respect and understanding, and be courteous at all times and under any circumstance. What a challenge; but can you imagine what we would find in our laboratories in the not too distant future? Yes — a very knowledgeable technical expert, who is also very human and is only too willing to be of service to others.

Therefore, we'll realise that even though technologists are not well recognised as other health workers, it's still very important for us to have good public relations.

Let's take a look at some of our common public at the workplace. These include fellow technologists, patients, blood donors, doctors, nurses and other hospital personnel. First of all, effective communication is needed amongst technologists. We need to work hand in hand as a team, communication freely and helping each other with each of our shortcomings, as no one is perfect.

Despite all our personal differences, we all belong to the same profession, and foremost on our mind should be our commitment to provide only the best service for the patients. With the current emphasis on getting the best equipment and the best quality control programme under way, in the same way, we need to improve on our outlook by having a positive attitude and treat our colleagues with respect, understanding and courtesy.

Next, the very reason why help from technologists are needed — the patients. We must at all times realise that most of the patients we come in contact with, have some degree of illness and discomfort.

They may be feeling apprehensive and frightened. Our willingness to be of assistance will help us to try to understand their feelings and be considerate of their disadvantage, thus treating them with kindness. Please bear in mind that without patients, we would not go to great lengths organising seminars, to better our knowledge, and to be of greater help to them.

We may also be learning so much, but one of the greatest challenges we face all the time is, to act on what we learn.

Also, I presume we all remember how we feel and the caring manner with which we treat our own family members when they are sick. Treating all patients equally like that would also be a great challenge for us all.

In addition to this, we have our Blood Donors. These are people from all walks of life, who may have to swallow their fear and summon up enough courage, before quietly walking into the blood bank with some form of apprehension.

With courtesy and respect, we should always be prompt in attending to these thoughtful people, and we should never forget how important they are. I am sure we all know the feeling of panic if told that the blood bank has run out of blood. As this is a situation we always try to avoid, all the credit should go to the blood donors. Especially, when considering the importance we place on always having a well-stocked blood bank.

Neither can we ignore the need to always have a cordial relationship with the doctors, for the welfare of the patients.

The relationship should be such that, we can ask each other polite questions and give helpful suggestions. And, we should always bear in mind that the patient will finally suffer the consequences of any communication breakdown between doctor and technologist.

In the same way, we need to realise that, nursing staff duties represent the centre and the most of hospital patient care. Therefore, a co-operative and co-ordinated relationship between the nurse and the technologist is also important. We should also have an understanding and mutual respect for both our contributions to the comfort and well-being of the patient.

Furthermore, as we all belong to the same organisation, the least we can do for other hospital personnel or for anyone we have to liaise with, is to have a daily cordial relationship, respect for one another and appreciate whatever role each have to play.

To conclude, we can see that daily, we have a lot of humans to interact with. Therefore, no matter how clever we may be, what social status we hold or what role we play, the inner self in all of us reacts favourably to a positive attitude, understanding and being treated in a courteous and respectable manner. And, to practice this ladies and gentlemen, is the challenge we are faced with, as from today.

And I presume that in the near future, with practice and confidence, we will be achieving great satisfaction from seeing and hearing people respond positively and happily to us when we talk to them.

Also, in the technical role we play in patient care, we may only be taking care of the physical need of the patient. But we should bear in mind that all humans also have psychological, spiritual and social needs. And even though we may not be able to satisfy all these needs, practising a loving concern for everyone, with a helpful attitude, should bring us much inner satisfaction, especially if people respond to you in the same way.

Finally, please remember that, whatever service we have to provide and in whatever field, at the receiving end, is a fellow human being. Therefore, our aim should be — to willingly give service. And feel happy about it, because what counts most in life is what we do for others, and remain humble through it all. To achieve this, we should pray for dedication, and eventually, we may reap success.

Thank you.

# COUNCIL NEWS

## Examinations

The QTA examination fee will increase to $125.00 from 1998. This examination has been subsidised by the NZIMLS in the past.

The fee for Fellowship will be $900 from 1998. If you are doing Fellowship by examination the fee will be $650 for Part I and $250 for Part II.

The new Fellowship regulations are in place and available from the executive office.

## Awards

The IAMLT awards programme has been circulated to each laboratory. You may be eligible to apply for an award so ask your charge scientist for the details.

## NZIMLS History

Since the writing of the 50 year history of the NZIMLS, a large amount of historical material has been received. Anne Paterson is sorting the material and it will then be archived at the Hocken Library at the University of Otago. This service is free and the NZIMLS retains ownership and has access to the material.

## Annual Scientific Meeting

A questionnaire on NZIMLS meetings was circulated at conference. This will be analysed to see what ideas members have on improving or changing the timing and format of NZIMLS meetings and a report will follow. Thank you to those people who filled in the questionnaire.

## Sponsorship

We are pleased to announce that Biolab Scientific Ltd have agreed to sponsor a membership package that the Council has been developing. This will be a cardboard folder for members to keep all NZIMLS information in. This would include dates of examination and meetings, addresses of MLTB, SIG convenors etc, rule book and details of awards. These will be updated annually or as appropriate.

## Council Committees

The following chart shows NZIMLS Council members responsibilities. Please contact the appropriate member if you wish to comment on their portfolio or if you have a concern. Comments may also be sent to the Executive Office where they will be referred to the appropriate person and placed on the agenda of the next Council meeting.

| | | | | |
|---|---|---|---|---|
| **EXAMINATIONS**<br>**Convenor: Les Milligan** | | | | |
| **Examinations**<br>Les Milligan<br>Trevor Rollinson | **BMLS Courses**<br>Massey Chris Kendrick<br>Jan Deroles-Main<br>Otago Les Milligan<br>AIT Anne Paterson | **MLTB/MOLS**<br>Les Milligan<br>Chris Kendrick | **Continuing Education**<br>Chris Kendrick | |
| **COMMUNICATION**<br>**Convenor: Anne Paterson** | | | | |
| **Public Relations**<br>Anne Paterson<br>Pip Sarcich<br>Tony Mace | **Conference/Industry**<br>Tony Mace<br>Anne Paterson<br>Grant Moore | **Sponsorship**<br>Anne Paterson<br>Tony Mace<br>Pip Sarcich | **Journal**<br>Rob Siebers<br>Shirley Gainsford | |
| **PROFESSIONAL AFFAIRS**<br>**Convenor: Shirley Gainsford** | | | | |
| **International/Political**<br>Shirley Gainsford | **Rules/Policies**<br>Grant Moore | **Awards**<br>Pip Sarcich | **Membership**<br>Grant Moore | **Finance**<br>Trevor Rollinson<br>Shirley Gainsford |

# New Zealand Institute of Medical Laboratory Science Minutes of the 53rd Annual General Meeting Held at the Wellington Town Hall on Wednesday 27th August 1997 at 4.00pm

## Chairperson
The President (Ms S Gainsford) presided over the attendance of approximately 36 members.

## Apologies
It was resolved that the following apologies be accepted:
- Geoff Day
- Judy Cull

*G Moore/M Lynch*

## Proxies
A List of 10 proxies was read by the Secretary.

## Minutes
It was resolved that the Minutes of the 52nd Annual General Meeting held on Wednesday 28 August 1996 be taken as read and confirmed.

*R Siebers/D Reilly*

## Business Arising

### Training of Students in Laboratories
- Council were advised that it is not necessary to be proactive by writing to laboratories concerned.

### Two and Three Year Budgets
- Council have spent a lot of time on the Institute's budgets and only now come to grips with it.
- At the stage now, where Council can start doing a projected budget for the next two years.

### Business Plan
- Council will consider publishing their business plan.

## Remits
It was resolved that Policy Decision No. 4 be reaffirmed.
"Policy Decision No 4 (1991): That the Code of Ethics as circulated to all members be adopted by the New Zealand Institute of Medical Laboratory Science (Inc)."

*T Rollinson/C Kendrick*

It was resolved that Policy Decision No. 6 be reaffirmed.
"Policy Decision No 6 (1979): That the Council must be informed in advance of national workshops, seminars or similar gatherings which are being conducted under the aegis of the NZIMLS organisations."

*T Rollinson/W Wilson*

## President's Report
It was resolved that the President's Report be received.

*S Gainsford/G Moore*

## Annual Report
It was resolved that the Annual Report be received.

*A Paterson/T Mace*

It was resolved that the Annual Report be adopted.

*C Kendrick/R Siebers*

## Financial Report
It was resolved that the Financial Report be received.

*T Rollinson/A Paterson*

The treasurer acknowledged the return of approximately $28,000 from the 1996 conference held in Auckland.

It was resolved that the Financial Report be adopted

*T Mace/J Shead*

## Election of officers
The following members of Council were re-elected unopposed:

| | |
|---|---|
| President | S Gainsford |
| Vice President | A Paterson |
| Secretary/Treasurer | T Rollinson |
| Region 1 Representative | P Sarcich |
| Region 2 Representative | T Mace |
| Region 3 Representative | C Kendrick |
| Region 4 Representative | G Moore |
| Region 5 Representative | L Milligan |

Therefore, no election was necessary.

## Awards
The award winners were announced and the awards where possible were presented by the President:

### Qualified Technical Assistant Awards
- Clinical Biochemistry Viivi Garam, Hutt Hospital
- Medical Cytology Kathryn Oliver, Wanganui Diagnostic Laboratory
- Transfusion Science Blood Products Lillian Roy Dunedin Hospital

### Specialist Certificate Awards
- Haematology Steven Schischka, Auckland Hospital
- Virology Peter Johns, Dunedin Hospital

## Honoraria
It was resolved that no honoraria be paid.

*T Rollinson/A Paterson*

## Auditor
It was resolved that Hillson, Fagerlund and Keyse be appointed as the Institute's auditors.

*T Rollinson/A Paterson*

## General Business

### Membership
- Noted that approximately 10 new members had been gained by the President attending the South Island Seminar and SIG meetings
- A Paterson considered that membership recruitment was not only Council's responsibility but members also.

- W Wilson noted that membership enrolment forms were part of the laboratory package for new employees. Council will explore this option.
- There is no membership fee differential for full and part time members.

### Financial

- T Rollinson asked for guidance with regards to the NZIMLS renewing its membership with the IAMLT.
- D Reilly spoke for the IAMLT which is a non-governmental organisation and is recognised by the World Health Organisations who approach the IAMLT on medical laboratory science matters. They offer awards, produce a publication and are involved in activities such as the Biomedical Science Day. It is a way for technologists to be involved in the world.
- W Wilson advised that one of the reasons for joining the IAMLT was that New Zealand cannot live in isolation which is even more so today. By being members of the IAMLT is one small way in which we can contribute and take a greater responsibility. Noted that the Australian Institute stopped their membership and have now re-joined.
- G Verkaaik suggested that the NZIMLS stay with the IAMLT as part of the growing of the profession.
- D Reilly commented on the finances stating that the Institute has a value of $48,000. Considered that the Institute should not be looking too much inwards and money should be used to make the profession advance.
- T Rollinson considered that the money is there to continue promoting medical laboratory science and to ensure that the Institute remains a going concern. Noted that the investment may have to be broken to help finance the South Pacific Congress.

### Venue for 1998 and 1999 Annual Scientific Meetings.

Palmerston North – 1998
Christchurch – 1999

Meeting closed at 5.17 pm

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# INSTITUTE BUSINESS
# Office Bearers of the N.Z.I.M.L.S. 1997-1998

### President
Shirley Gainsford
Valley Diagnostics, Lower Hutt

### Vice President
Anne Paterson
Lakeland Health, Rotorua

### Secretary/Treasurer
Trevor Rollinson
Southern Community Laboratories, Dunedin

### Council
Pip Sarcich, Chris Kendrick, Les Milligan
Tony Mace, Grant Moore

### Executive Officer
Fran van Til
P.O. Box 3270, Christchurch
Phone/Fax (03) 313-4761.
E-Mail:

Please address all correspondence to the Executive Officer, including Examination and Membership enquiries.

### Editor
Rob Siebers
Dept. of Medicine, Wellington
School of Medicine, P.O. Box 7343
Wellington South.
E-Mail:rob@wnmeds.ac.nz

### Membership Fees and Enquiries
Membership fees for the year beginning April 1, 1997 are:

For Fellows – $101.40 GST inclusive

For Members – $101.40 GST inclusive

For Associates – $48.10 GST inclusive

For Non-practising members – $44.20 GST inclusive

All membership fees, change of address or particulars, applications for membership or changes in status should be sent to the Executive Officer at the address given above.

Members wishing to receive their publications by airmail should contact the Editor to make the necessary arrangement.

# FELLOWSHIP

## *by* examination

includes Part one and Part two

*applications close*

**31st March 1998**

Contact the Executive Officer
NZIMLS
P.O. Box 3270
Christchurch

for application form & information booklet

# Review of the Arrangements for Licensing Medical Laboratory Technologists

## Proposal

1. This report recommends the continued regulation of medical laboratory technologists as well as a number of changes to the present arrangements for regulating this occupation.

## Background

2. The Medical Auxiliaries Act and the Medical Laboratory Technologists Regulations 1989 provides for the licensing of medical laboratory technologists (MLTs). MLTs take, prepare, and analyse human tissues and fluids to help in the prevention, diagnosis and treatment of disease. They also provide blood products for transfusion or medication purposes. The selection of the technology to perform a test, the establishment of control procedures, and the maintenance and calibration of the analysers used are the responsibility of MLTs. Training and experience is required in nine specialities: cytology, microbiology, biochemistry, haematology; cytogenetics, transfusion science, virology, immunology and histology. Training and experience is also required in the use of sophisticated equipment for conducting tests.

3. There are approximately 1200 registered MLTs working in New Zealand. In addition there are approximately 800 laboratory assistants who work under the direction and supervision of MLTS. The vast majority of MLTs are employed by Crown health enterprises and private laboratories.

4. Most laboratory tests are requested by medical practitioners. They are rarely requested directly by the public. Usually MLTs do not interface directly with the public, nor in many instances do members of the public choose which MLT will analyse the provided samples. Medical pathologists act as the clinical interface between the laboratory and medical practitioners. Their role is predominantly one of advice on the interpretation of results and the most appropriate treatment. The sharing of responsibilities between MLTs and pathologists varies depending on the distribution and availability of pathologists in laboratories around the country. For example, out of the 42 identifiable CHE laboratories in the country, 11 are staffed with specialist pathologists covering most disciplines, 10 operate with 'non-specialist' pathologists on a part-time basis, and 21 function with no pathologist on site but have a visiting pathologist.

5. MLTs are regulated in the United Kingdom Canada and numerous states in the United States of America. In Australia and some states of the United States MLTs are not regulated.

## The Need to Regulate MLTs

6. The risks associated with the practice of medical laboratory analysis and the preparation of blood products are those associated with incorrect analysis of samples and the transfusion of blood products which are either infected or incompatible with the recipient. These risks are managed in a variety of ways. In addition to the current licensing regime for MLTs, risks posed by incompetent practitioners are also managed through quality assurance mechanisms and supervision arrangements under which more experienced practitioners check the analytical results of those less experienced members of the laboratory. The area of greatest risk arises in the small to medium laboratories where only one staff member may be rostered on at night or during the weekends, or in an emergency situation where an MLT may be under considerable pressure and expected to cover several disciplines rapidly and accurately, and there is no time for peer review procedures to operate. In such cases, the correct analysis of samples is reliant on the skill, training and knowledge of the individual MLTs.

7. Arguments for and against the continued regulation of MLTs are discussed below.

8. The MLT Board and the New Zealand Institute of Medical Laboratory Science consider there is a need to continue to regulate MLTs because:

(a) statutory regulation ensures the public are protected from practitioners that have not received sufficient training to undertake the work of MLTs;

(b) there is the potential for incompetent practitioners to cause significant harm. Most laboratory tests are requested by medical practitioners who rely on the accuracy of results. By the time a practitioner realises that a laboratory result is wrong, the patient may have been hospitalised, an infection spread, or a death occurred. Such harm ultimately results in trauma to the patient and in costs to the health service;

(c) many of the procedures performed by MLTs are invasive eg blood collection on hospital wards or in laboratory specimen collection bays, taking swabs (eg an ear swab) from a patient with a suspected infection, and collection of skin scrapings (eg scrapings from a skin lesion suspected to be ring worm);

(d) statutory regulation provides employers with a means of identifying and employing safe and appropriately trained MLTs who are accountable for the tests they carry out. The Institute of Medical Laboratory Science says that without regulation "employers cannot always be relied upon to employ competent staff and in an effort to increase profits may employ unqualified incompetent persons if the opportunity is available". The Board believes "it is reasonable to suggest that an employer will unwittingly employ under qualified practitioners if regulatory provisions are relaxed". It considers this is particularly so, given the number of overseas trained applicants who do not meet the registration requirements;

(e) medical laboratory assistants work under the supervision and direction of MLTs. If MLTs are not regulated there is a risk that medical laboratory assistants will not be given adequate oversight in their work.

9. Arguments against the continued regulation of MLTs are:

(a) generally MLTs do not interface directly with the public. Any risks to the public axise from the possibility that medical practitioners requesting the tests will give the incorrect treatment if the laboratory makes an incorrect report on the condition of a consumer, rather than by the direct action of the MLT;

(b) Employers currently take responsibility for ensuring the quality of their laboratory testing. As part of this quality assurance they institute checking procedures to minimise mistakes. This includes employing competent MLTs. There is no evidence to suggest that without regulation employers will "employ unqualified incompetent persons". In Australia, for example, employers of MELTs are guided in their employment decisions

by the professional body, the Australian Institute of Medical Science. The costs arising from the need to repeat test procedures are likely to provide a significant incentive to employers to hire competent MLTs;

(c) there is little overseas evidence of reduced consumer safety where MLTs are not regulated;

(d) professional organisations such as the Institute of Medical Laboratory Science could provide a means of maintaining or enhancing professional standards without the need for regulation. If successful, membership of such organisations would provide employers with meaningful information about the competence of individual practitioners. Admittedly it would be more difficult to ensure that practitioners were meeting such standards since they would be voluntary;

(e) other statutory mechanisms such as the Health and Disability Commissioner Act 1994 and the Consumer Guarantees Act 1993 provide protections to consumers, and incentives for practitioners to provide competent services.

10. In the Ministry of Health's view, the risks of wrong diagnosis (which could in some cases be life threatening) are managed through a variety of measures of which licensing is but one. The other measures include quality assurance processes and management structures which ensure that the more highly experienced staff act as "peer reviewers" of the analysis carried out by less experienced technicians. As noted above there will be occasions in which these other measures do not operate or can only operate retrospectively. In these situations reliance on a safe outcome is dependent entirely on the competence of the individual practitioner. In the Ministry's view these occasions are sufficiently frequent, and the possible outcomes of incompetent practice so severe, that a continuation of some form of occupational registration is justified.

## Revision of the Medical Auxillaries Act 1966 and Medical laboratory Technologists Regulations 1989

### Registration: Title Protection

11. In addition to restricting those who may practise, the current Act contains title protection provisions protecting the title medical laboratory technologist". The Board and the Institute of Medical Laboratory Science propose that the titles "medical laboratory technologist" and "medical laboratory scientist" be protected. The term "medical laboratory scientist" is increasingly being used to describe the profession. It would be an offence for a person who is not registered to use these titles or to hold themselves out to be qualified to practise medical laboratory technology. This would ensure that untrained or unqualified people do not practise medical laboratory technology.

### Composition of the MLT Board

12. The MLT Board comprises representatives of the Director General of Health and Education; two medical practitioners; and five MLTs. Currently the majority of the Board members are appointed by the Minister of Health on the nomination of specified professional organisations such as the Institute of Medical Laboratory Science.

13. The Board, the Institute and the Ministry do not consider it is essential to have a Ministry representative on the Board, as long as the Board and the Ministry maintain close links with one another. The Board, the Institute and the Ministry all agree that there is no need to have a Ministry of Education representative on the Board.

14. The MLT Board supports retaining at least one pathologist on the Board because the role of pathologists and MLTs is intertwined. The Board values the medical practitioners' input and considers their professional expertise assists the Board in its functions. The Ministry agrees that there is a strong working relationship between MLTs and pathologists. It, however, questions whether it is necessary to have two medical practitioners on the Board, and instead suggests the appointment of one pathologist.

15. The MLT Board suggests a Board comprising four registered MLTs; one pathologist, and two lay people. The Institute suggests a composition of four registered MLTS, and four other persons appointed by the Minister of Health. It also suggests that the chairperson should be a MLT. The Ministry believes the legislation should empower the board members to elect a chairperson.

16. It is suggested that the MLT members of the Board, either be nominated by the Minister after consultation with the profession, or be elected by the profession. Representation through election would enable all registered practitioners to have a say in the composition of the Board. The Ministry notes that the Institute represents about 80% of the profession. The Institute and the Board are opposed to any change to the current nomination rights, and claim that the MLT profession is too small to bear the cost of a properly conducted election. Since the profession does not favour the election of practitioners to the board, it is suggested the Minister of Health appoint these persons after consultation with the profession. Having regard to the above arguments and those set out in "Reform of Health Sector Occupational Regulation Statutes", it is proposed that the MLT Board comprise:

(a) four registered MLTs holding annual practising certificates appointed by the Minister of Health after consultation with the profession;

(b) one pathologist appointed by the Minister of Health after consultation with the medical profession;

(c) three people appointed by the Minister of Health (one of whom may be a registered MLT).

### Other Matters: Exceptions to Statutory Prohibition

17. The Medical Laboratory Technologists Regulations allow for the granting of permanent exceptions from the requirement to be a registered MLT in order to perform medical laboratory technology. Permanent exceptions are granted to medical practitioners, scientific officers, medical laboratory assistants, and trainee medical laboratory technologists. These exceptions exist because MLTs are subject to a licensing regime which defines the practice of medical laboratory technology in such a way that it encompasses work carried out by other occupations. The retention of permanent exceptions is not necessary under a cerfication regime (which does not define the practice of medical laboratory technology). Whether or not statutory exceptions are required will be dependent on the retention of the present licensing arrangements.

### Recommendations

18. It is recommended that you:

**Need for regulation**

(a) either

(i) **agree** that medical laboratory technologists not be subject to regulation;

or

(ii) **agree** that medical laboratory technologists continue to be regulated [Ministry of Health view] and the titles 'medical laboratory technologist' and 'medical laboratory scientist' be protected;

### Board Membership

(b) **agree** that the Medical Laboratory Technologists Board comprise: four registered medical laboratory technologists holding annual practising certificates appointed by the

Minister of Health after consultation with the profession; one pathologist appointed by the Minister of Health after consultation with the medical profession; and three people appointed by the Minister of Health (one of whom may be a registered medical laboratory technologist).

# Reform of Health Sector Occupational Regulation Statutes

The Ministry of Health intends to present a report on the "Reform of Health Sector Occupational Regulation Statutes" to the Minister of Health and subsequently to Cabinet at the end of August 1997.

The report discusses whether the principles of the Medical Practitioners Act 1995, provide a suitable basis for regulating health occupations, then makes recommendations on the form the statutes should take.

Separate reports which address issues related to specific occupations are included. The above is the report for Medical Laboratory Technologists.



The Council of the NZIMLS is reviewing the NZIMLS Annual Scientific Meeting (ASM) and the relationship of Special Interest Groups (SIGs) to the ASM. We value your support and ideas and ask you to complete the following questionnaire and return it to Tony Mace, C/- Pathlab Waikato, P 0 Box 9115, Hamilton.

1. Are you a member of the Institute Yes ❑ No ❑

2. Should the ASM be held:
   a. Yearly ❑ b. Every two years ❑ c. Other ❑
   Comments:

3. Do you think more people attend SIG meetings than the ASM?
   a. Yes ❑ b. No ❑ c. Don't know ❑
   Comments:

4. If the ASM were other than yearly, should the SIGs have their meetings in the off year only?
   a. Yes ❑ b. No ❑ c. Don't know ❑

5. Should the ASM be always in August/September?
   a. Yes ❑ b. No ❑
   If not, when?
   Comments:

6. Should provincial towns/cities hold the ASM?
   a. Yes ❑ b. No ❑
   If yes, how could they be encouraged to do so?
   Comments:

7. If no to Question 6, should the ASM be held in the same place every time?
   a. Yes ❑ b. No ❑
   Comments:

8. If yes to Question 7, who would make up the committee?
   Comments:

9. Are SIGs fulfilling their goal?
   a. Yes ❑ b. No ❑ c. Unsure ❑
   Comments:

10. Should SIGs work
    a. Nationally ❑ b. Regionally ❑ c. Locally ❑

11. Should SIG's be only to Institute members?
    a. Yes ❑ b. No ❑ c. Unsure ❑
    Comments:

12. Should the ASM be only to Institute members?
    a. Yes ❑ b. No ❑ c. Unsure ❑
    Comments:

13. Any general comments you would like to make about the ASM and/or SIGs:

# NZIMLS President's Report

Last August I became the President of this Insitute. My initial excitement was cut short when I learned that there were no representatives for 3 regions.

By the end of the conference, however, 3 volunteers had been accepted on to the Council. At our first meeting we enthusiastically devised a strategic plan, the goals of which are listed in the annual report. Unfortunately at our second meeting we had to set some of these goals aside to spend much of the meeting discussing the Institute's finances and how to cut costs. Our problems were identified as:

I) Falling membership.
2) Income unknown.
3) Expenditure approved (over and above that required for the running of the office and Council) without knowing if funds would be available.
4) Cost of examinations and journal exceeds income.

These have been adressed by:

1) Trying to increase the membership. As a start I have attended all Special Interest Group meetings and the South Island Seminar, giving a presentation on the NZIMLS, followed by a letter to all registrants inviting them to join the NZIMLS.
2) Producing a business plan and monitoring cash flow.
3) Cutting Council meetings from 4 to 3 a year and reducing expenditure to what is absolutely necessary.
4) Implementing a cost recovery programme for the journal and examinations.
   From 1998 the fee for the QTA examination will become $125. Fellowship examination fees will be $900.
   We aim to produce the journal at a standard cost for each issue and have reviewed the cover, type of paper and size. The advertising income has increased this year but we know that to keep the advertising we must get the journal out on time and increase its scientific content.
5) Increased fees for non members using the NZIMLS.

In the last year the Fellowship regulations have been finalised and the new Fellowship will be available from 1998.

Submissions have successfully been made to the Ministry of Health (MOH) on continued regulation of medical laboratory scientists with the MOH now supporting regulation of our profession in its final report to the Government.

We have made a big turn around from the $41700 deficit of last year to a small profit of $1400. (However, a 1996 conference profit of $28,000 helped).

I thank the Special Interest Group committees for their work in organising excellent seminars and thank examiners and moderators of QTA and Specialist level examinations.

Thank you to Fran van Til, our executive officer for her fine work and to Trish Reilly for increasing the advertising in the journal.

I thank the Council members for their work, co operation and support. I hope that they retain their enthusiasm at this frustrating time when we cannot implement all our plans because of a lack of funds.

I must give special thanks to two Council members who have carried a large load this year.

Ann Paterson produced the history of the last 50 years of the NZIMLS. To do this Ann spent evenings over many months in a caravan at the back of their house leaving little time for the family. The result is a publication which we can all feel proud of.

Trevor Rollinson has been responsible for the new Fellowship qualification, whilst also being Treasurer in a difficult year. He has done well to keep us to a budget that has produced a small profit.

The viability of the NZIMLS still concerns me. It does not rest solely with the Council but with you, its members. I thank you for your support. If you would like to contribute more please encourage more people in your laboratories to join the Institute and take part in its activities.

**Shirley Gainsford**
**Valley Diagnostic**
**Lower Hutt**

# Letter to the Editor

## Health and Safety Network

Dear Sir

I write this letter to update members re progress on the formation of a Health and Safety network.

In July 1997 a memo was sent to medical laboratories throughout New Zealand to ascertain the level of interest re formation of such a network, some of the reasons for forming such a network being:

1. To ensure the health and safety of those working in medical laboratory science.
2. To share information, expertise and ideas e.g. newsletters, seminars (hopefully, one next year).
3. To work towards compiling national statistics relating to health and safety issues in our industry.
4. To improve communication on health and safety issues.

Several members of Council indicated that depending on a favourable response it may be possible to set up a Special Interest Group under the umbrella of the NZIMLS. So far the response has been extremely positive. I am at present putting the proposal of a Health and Safety Special Interest Group in writing to be put to Council when they meet in December.

I would appreciate further feed back and ideas from NZIMLS members and an indication from those who would like to be more actively involved in the formation of this group.

Susan Duncan
Wanganui Diagnostic Laboratory
163 Wicksteed Street

# New Products and Services

## Systems Innovation Increases Laboratory Efficiency

The latest innovation from Delphic Medical Systems is saving up to 50% in report turnaround time for Pathology departments in New Zealand hospitals and laboratories.

A Case Study commissioned by Delphic has found the Palms Anatomical Pathology system, (Palms AP) is improving efficiency in time, cost, and Pathologists' editorial control over their report procedures.

Histopathologist at Auckland's Greenlane Hospital and Clinical Director of Laboratory Services, Dr Judith Baranyai and manager of Rotorua's Diagnostic Laboratory, Dr David Taylor, have worked with the new Palms Anatomical Pathology (Palms AP) over the past six months, and said the investment has saved their laboratories both time and money.

Dr David Taylor expects the current daily savings in clerical time of 15% with Palms AP to increase to up to 75% when they introduce the Voice Recognition feature to their system. Rotorua Diagnostic is currently the only service in Rotorua using a Histology system like Palms AP. Since the system went on-line six months ago, Dr Taylor said interest from colleagues has been high, particularly in the system's flexibility and its potential to significantly reduce clerical time.

"Not only is administration time affected, but for me, time taken writing reports to referring GPs has been reduced by up to 80% with the system's Coded Phrases feature. This allows me to 'pre-write' between 75% to 80% of diagnoses through Palms AP's Comments Dictionary which has an impressive range of medical terminology in-built.

"Ultimately, the system has improved our lab's efficiency, which frees us up to take in more referrals from our local GPs," said Dr Taylor.

Dr Judith Baranyai specialises in Gynaecologic Pathology in Greenlane's Histopathology Department. Under Auckland Healthcare, Greenlane is the fifth installation of Palms AP in New Zealand. Auckland Hospital is scheduled to have Palms AP running in December this year, making communication between the two A+ sites flow faster.

"The main difference the programme has made is that we can produce final Pathology reports one or two days earlier than previously. Traditionally, a lot of interaction occurred between the histopathologist and clerical staff with typing interim reports, checking them for clerical error, editing and submitting them for final amendment before signing them out to the Clinician. Now we only need to see the report once onscreen, click in coded words and phrases where needed, and issue the report ourselves if necessary."

Dr Baranyai has also noticed significant reductions in paper usage through the need for hard copies of reports being eliminated.

"We are also required to submit data to the National Cervical Screening Registry. The previous system of hard copy submissions was quite time-consuming, now we can tag the information and send it to the Registry electronically. This eliminates risk of error and cuts down our time," Dr Baranyai said.

*Released on behalf of Delphic Medical Systems by PRaxis Public Relations, phone Clare Scannell on (09) 373 5068, or contact:*

*Louise Brewer*
*Marketing Services Manager*
*Delphic Medical Systems*
*Ph: (09) 630 3554*

## Victoria University Leads World With Move to Glass-Free Lab

Victoria University has scored a world first with the launch of a glass-free laboratory.

An animal physiology and cell biology teaching laboratory will carry out comparative research for 12 months between the use of Nalgene plastic in one laboratory and glass in the laboratory next door. The project is being run by Janet Butler, laboratory manager for the School of Biological Sciences.

"The use of plastic in research and teaching laboratories is a growing trend overseas, but nowhere else has a move been made to replace glass almost entirely with Nalgene plastic," says Mrs Butler. The glass equipment being replaced by Nalgene plastic includes measuring cylinders, reagent bottles, conical flasks, beakers and volumetric flasks.

Mrs Butler says the benefits of Nalgene plastic over glass include that it does not break and cause injuries, has lower operating costs through reduced breakages, and is easier to store and lighter to transport.

"Safety considerations are very important in laboratories and I think there will be a real shift towards Nalgene plastic for this reason," she says.

The Victoria University trial was encouraged by visiting overseas scientists and academics familiar with using plastic equipment, particularly in America and Britain.

"I was challenged by Nalgene to confront my pro-glass prejudices by doing a 12 month comparison between the two materials," Mrs Butler says.

Scientists, medical professionals and teachers will follow the glass-free laboratory research at Victoria with interest and many are expected to visit the laboratory to try the plastic equipment for themselves.

Nalgene plastic scientific and medical equipment is manufactured in the United States and distributed in New Zealand by Medic Corporation Limited.

Medic Corporation will assess the performance of the Nalgene plastic equipment throughout the trial and gain feedback from staff and students using the laboratory.

*For further information:*
*Janet Butler*
*Laboratory Manager*
*Victoria University*
*Ph: (04) 472 1000 ext 8138*
*Stephen Lee*
*General Manager, Scientific and Industrial Division*
*Medic Corporation Limited*
*Ph: (04) 577 0000*

## Furijebio HemSp Kit for Fecal Occult Blood

It is well known that early detection of colorectal cancer greatly

enhances the success rate of treatment for this condition. Detection of pathological intestinal bleeding using fecal occult blood testing methods, is considered a useful screening test to detect cancer in asymptomatic persons. The problem is being able to detect this accurately and specifically.

After testing the New Zealand market with the FUJIREBIO HemSp kit for fecal occult blood, MEDIC CORPORATION LTD are proud to launch this superior method of testing to all diagnostic and medical laboratories.

The test is a HUMAN SPECIFIC one which uses chicken erythrocytes to bind antibodies to particles via a haemagglutination process. As it is specific for and highly sensitive to fecal occult blood, there are NO DIETARY RESTRICTIONS for the patient. This makes sampling easier and minimises the incidence of false positives and negatives. Detection levels of human haemoglobin as low as 100-200 µ/g stool.

Results are obtained within a 30 minute incubation period. They are easy to read and reproducible which makes the FUJIREBIO HemSp kit the ideal method for mass screening.

For further information please contact your local MEDIC representative or phone product specialist, Sarah Maffey, (09) 6233300. Training seminars and specially-priced trial kits are available.

## Elecsys Vitamin B 12 and Folate

The measurement of serum B12 along with folate plays an integral role in diagnosing the etiology of megaloblastic anemia.

Boehringer Mannheim has developed two new assays for measuring B12 and folate in serum using the electrochemiluminescence (ECL) technology on Elecsys automated immunoassay analysers. The assays feature easy to use liquid stable reagents, consistent lot-to-lot results, sensitivity and precision, automated sample pre-treatment, and random access availability on the *Elecsys* 2010.

The dynamic range for the *Elecsys* B12 assay is 0 - 1476 pmol/L with an LDL of 22 pmol/L; folate ranges from 0 - 45 nmol/L with an LDL of 1.13 nmol/L. Reagents are stable on-board the 2010 for 8 weeks. Intraassay imprecision of <5% and total imprecision of <8% are routinely achieved for both assays.

The *Elecsys* assays are well correlated with existing methods. When compared with the BioRad Quantaphase 11, the *Elecsys* B12 yielded a slope of 1.0515 and intercept of 5.01 (pmol/L); folate slope was 0.9065 with an intercept 0.59 (nmol/L). Correlation coefficient was r=O.98 and 0.96 respectively.

No significant interference was found in the presence of serum proteins, triglycerides, bilirubin, haemoglobin, biotin or rheumatoid factor. B12 cross reactivity with cobinamide at 200µ/mL, and folate with aminopterin, amethopterin or folinic acid, was minimal.

The *Elecsys* serum B12 and folate assays will soon be available for use by all *Elecsys* users in New Zealand. Final in-field evaluations, including a limited release local trial, are scheduled for completion in November 1997.

*For further information contact your Boehringer Mannheim NZ representative or call David Beins on 0800 652634, (09) 2764157 or 025 2705111, or email BeinsD@BMNZ.co.nz.*

## Digoxin on Elecsys Immunoassay Analysers

Digoxin is widely prescribed for the treatment of congestive heart failure and various disturbances of cardiac rhythm. Therapeutic use of digoxin improves the strength of myocardial contractions and results in the beneficial effects of increased cardiac output, decreased heart size, decreased venous pressure and decreased blood volume. Digoxin therapy also results in stabilised and slowed ventricular pulse rate.

Rapid and accurate measurement of serum digoxin facilitates the effective management of patients manifesting these conditions.

Boehringer Mannheim has developed a new assay for measuring digoxin in serum using the electrochemiluminescence (ECL) technology on *Elecsys* automated immunoassay analysers. The assay features low cross reactivity to 57 tested therapeutic analytes and low interference by digitoxin and DLIS. In one study only 4% of digoxin-free DLIS samples measured by Elecsys recovered values >O. 19 nmol/L, whereas a popular alternate method measured 53% of the same cohort at >O.19 nmol/L.

The *Elecsys* digoxin assay cross reacts with the major digoxin metabolites, digoxigenin-bis-digitoxiside (70%), digoxigenin-monodigitoxiside (55%), and digoxigenin (15%) so as to closely approximate their relative bioactivities in vivo.

The dynamic range for the *Elecsys* digoxin assay is 0.0 - 6.4 nmol/L with an LDL of 0.19 nmol/L. Reagents are stable on-board the 2010 for 8 weeks. Lot recalibrations are recommended only once every 3 months. Intra- and total assay imprecision of <5.24% are routinely achieved.

The *Elecsys* assay is well correlated with existing methods. When compared with an mFPIA assay, the *Elecsys* digoxin yielded a slope of 1.0635 and intercept of 0.077 (nmol/L). Correlation coefficient was r=0.99.

*For further information contact your Boehringer Mannheim NZ representative or call David Beins on 0800 652634, (09) 2764157 or 025 270511 1, or email BeinsD@BNMZ.co.nz.*

## 3D Imaging Technique with Microscopes from Carl Zeiss

The world surrounding us - including the microscopically small world is three dimensional. Until now, however, images could only be viewed three dimensionally using stereomicroscopes. Carl Zeiss has now developed a 3D imaging method for classical light microscopy. High-resolution, true-colour and real-time microscope images with magnifications of 1000x and higher are now possible without any need to forego the familiar benefits of compound light microscopy, such as superior resolution and contrast. In addition to 3D viewing, the new technique has further benefits — the resolution has been improved by up to 15% and the depth of focus of the microscope image is two to three times better.

This all promises a new dimension in observation quality, for example in the semiconductor industry, where dirt and contamination in the various lacquer layers of wafer discs can be localized more quickly and reliably. In materials microscopy, the topography of opaque surfaces can be visualized. Last but not least, mention should also be made of the benefits provided for the life sciences, for example in the micromanipulation of cells in both the patch-clamp technique and in the IVF field — particularly in intracytoplasmatic sperm injection (ICSI) — in other words, for all applications where orientation in three dimensions is of major importance.

With special eyepieces, the 3D imaging technique can be implemented on almost the entire line of Zeiss microscopes. Special video equipment also permits the presentation of these true-depth 3D images on a suitable monitor.

*For further information please contact:*

Carl Zeiss (NZ) Limited
9 - 15 Davis Crescent
Newmarket, Auckland
Phone: (09) 520 5626
Fax: (09) 520 5619
email: info@zeiss.com.au
web: http://www.zeiss.de

Carl Zeiss (NZ) Limited
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Lower Hutt
Phone: (04) 566 7601
Fax: (04) 566 7501

# Abstracts of the 51st Annual Scientific Meeting of the NZIMLS, Wellington, August 1997.

**Health Services Directions Laboratory Services – Private Business or Public Service?**
**John Drayton, ACA, FNZIM**
**Health Consultant to CHE Board**

A number of Crown Health Enterprises have recently 'outsourced' the provision of hospital laboratory services generally by way of a service contract of up to five years duration.

The reasons for these decisions, the potential benefits arising and key issues to be addressed, will be covered in this address.

Attention will be given to the Coalition Agreement on health, current Health Authority policy and Laboratory's position as a core or non-core service.

Specific matters addressed include: the merits of 'outsourcing' as opposed to an 'in-house option', the contractual process, costs involved, cultural change, information systems, peer support, funding of services, service rationalisation and quality issues.

The address will conclude with some ideas on the future provision of 'integrated laboratory services.

**Surviving the Bureaucracy**
**Mr Graham Millar**
**Professional Counsellor/Facilitator**

After some twenty years as an Officer of The Salvation Army, much of it spent in counselling and educational roles, Graham Millar now operates his own Counselling practice, while retaining a supervisory role of the Army's frontline counsellors.

In recent years, Graham has specialised in Change Management counselling, both for individuals, and more particularly, groups and organisations.

His relaxed, uniquely New Zealand style as a group facilitator ensures a steadily increasing demand for his services, as does the economic drivers that influence New Zealand today.

**From Blood on my Hands to a Dolphin on my Doorstep**
**Kevin McLoughlin**
**Manager**
**Federal Hotel, Picton**

Surviving life as a medical laboratory technologist for 34 years could be classed as an achievement in itself. Shrugging off the vast grey blanket of security after such a time to start afresh requires courage, bravado and a sense of adventure as well as a desire for achievement.

With a nostalgic look-back at the changes in the health service as an introduction, the subject of stress in the medical laboratory worker is covered - including the stress caused by the frustrations of working in a huge pyramid of bureaucracy. Coping with change is a major determining factor in the measure of success either as individuals or as a service. We may have coped but have the changes worked or been worth all the heartache?

**One Person's Ceiling is Another One's Floor**
**Mike Southern**
**Clinical Territory Manager**
**Biolab Scientific**

In this brief presentation, I will not be providing 'step by step' ways to survive the bureaucracy, as the term 'surviving' I feel is misleading. Besides, what works for one person will not necessarily work for another.

With the benefit of hindsight, some issues become more easily understood, and the key to enjoying a happy working relationship with bureaucracy, is to understand what the issues are, and what individuals can do about them!

**Life in the CHEese**
**Jennifer Mitchell**
**Manager, Laboratory Services**
**Auckland Healthcare**

What is bureaucracy? Why does it exist? What's bad about it? What's good about it? Is there more or less now? Is it different? How can one survive it? Is it possible to do more than just survive?

These questions and more from a survivor of six months with Auckland Healthcare.

**Life, the Lab, and Everything: A Look at the 'Job', the Person, and the Marriage**
**Gerard and Beverley Verkaaik et al**
**Blenheim**

What a wonderful 'instrument the retrospectoscope is... if only we knew then, what we know now.... We would do it differently, but not necessarily any better; chances are we would just make different mistakes. We would learn to recover from them a little faster perhaps, but would the outcome be that much different?

Through a series of 'Dear Dad' letters, this presentation seeks to examine the dynamics of family life in a medical environment, the effects of personality of the 'job' and vice versa.

"As a teenager I vowed that I would never let my job take up as much space as my father let his... guess what."

This presentation has been thirty years in the making, and we're still on the learning curve. The chemistry however is stabilising; despite the variable environment, a steady-state reaction is in place and is not expected to reach endpoint or substrate depletion. In fact, like a good Marlborough vintage, it is enhanced by adversity and is improving with age.

What about the scientific content? Good science cannot be practised if stress levels are not managed well, whether the cause of stress is exogenous or endogenous is immaterial. The experiences presented shared and discussed in this session will be helpful to all involved in the Health scene.

**Responsible care™: SH & E Performance Standards Are Coming – Ready or Not!**
**Barry Dyer**
**Chief Executive**
**NZ Chemical Industry Council**

- A review of the present hazardous substances legislation
- An introduction to employer responsibilities

- The need for industry based performance standards
- Compliance auditing
- An integrated SH&E management system.

The primary aim will be to provoke discussion concerning the safe management of medical waste. A secondary aim will be to introduce the Council's Responsible Care™ programme as a comprehensive SH&E management system.

The intention would be to brief delegates on a new NZCIC Code of Practice tentatively called 'The Safe Management of Medical Waste'. This COP is intended to address all of the issues the health industry needs in a single performance standard dealing with medical waste.

The COP will be trialled throughout the industry and then adopted as a New Zealand Standard.

**Proposed System for the Transportation of Infectious Substances (Class 6.2 Diagnostic Specimens & Biological Products)**

**Grant Quinn**
**Containment Systems NZ Limited**
**Bill Clough**
**General Manager, Gryro Plastics Limited**

Manufacturers of Hazardous Goods Stores have designed and received Ministry of Health approval for four segregation devices for the transport of Class 6.1 and Class 8 products.

Hazardous Goods Containment Systems (NZ) Limited together with Gyro Plastics Limited, after extensive research have designed systems for the 'safe' handling and transportation of Class 6.2 products.

**Accreditation – The Costs and the Benefits**

**Graham Walker**
**Programme Manager - Medical Testing and Radiology**
**International Accreditation New Zealand**

The costs of accreditation are significant and are more or less measurable.

The benefits however, although usually readily obvious, are somewhat intangible.

Throughout the nineties, all medical testing laboratories have been subject to a greater or lesser extent, to cost savings and economies unprecedented in the history of pathology. Gone is the philosophy of 'just in case' requesting of medical tests. Instead, most clinicians are actively seeking to reduce their dependency on a comprehensive battery of pathology tests prior to diagnosis and patient treatment.

Increased competition in the pathology industry has applied additional pressures on most medical testing laboratories, and the state funded purchasers of pathology services are more and more seeking cost per test parity between CHE and Community medical testing laboratories.

This definitely is then, an every dollar counts environment in which careful consideration must be given to each and every dollar spent. The owners, managers and administrators of pathology laboratories, quite appropriately expect, a demonstrable return on even small sums of extraordinary expenditure.

How then can the significant cost of accreditation, be financially justified?

How can the best possible advantage be made of the direct and indirect cost of accreditation? How does accreditation affect the bottom line?

These are basic questions that may well be asked by the accountants of medical testing laboratories.

This presentation explores the direct and indirect costs of medical laboratory accreditation and develops discussion in relation to the costs of not having accreditation.

**The Pacific Paramedical Training Centre and the Development of Blood Bank Technology in the Pacific Islands**

**R Mackenzie, M Lynch, T Lakshman**
**Pacific Paramedical Training Centre**
**Wellington**

The improvement of Blood Bank Technology in the Pacific Islands over the past 17 years has in large measure resulted from technical training provided by The Pacific Paramedical Training Centre.

The Pacific Paramedical Training Centre was established on the Wellington Hospital campus in 1981, its mission to provide training assistance to the clinical laboratories and blood transfusion services of the Pacific Island countries.

In 1991 the Centre became a Collaborating Centre of The World Health Organisation. This status carries with it responsibilities for a range of medical laboratory programmes in the Pacific Island Region. These include training and laboratory development, a regional quality assurance programme and advisory services.

Blood Bank Technology has been and remains a major focus of the Centres training activities. To date some 120 blood bank technicians have attended PPTC courses from a variety of Pacific Island locations.

In this presentation:

- the training philosophy of The Pacific Paramedical Training Centre is defined.
- the unique nature and needs of the Pacific Island Blood Transfusion Services are described.
- Pacific Paramedical Training Centre Blood Bank Training Courses are discussed.
- the impact of past training courses on the present quality of Pacific Island blood transfusion services is reviewed.
- some future needs of the Pacific Island blood bank technology is outlined.

**Wiskott-Aldrich Syndrome – A Success Story**

**Carole Watson, Christine van Tilburg, Dr L Teague**
**Auckland Regional Blood Service**

In early 1996 a child was referred to Auckland's Starship Hospital with extensive seborrhoeic eczema and a sparse petechial rash. Family studies and clinical investigations led to the diagnosis of Wiskott-Aldrich Syndrome (WAS).

Wiskott-Aldrich Syndrome is an x-linked immunodeficiency disease associated with thrombocytopenia, recurrent infections, eczema and a predisposition to malignancy. In this case Stem Cell (Bone Marrow or Cord Blood) transplantation was considered the only viable option for long term survival.

After an extensive Australasian and International search an HLA partial match was found at the New York Cord Blood Bank, and arrangements were made to ship it to Auckland. As a New Zealand 'first' the importation of the Liquid Nitrogen frozen cord blood raised great interest.

On 30th September 1996 the frozen cord blood arrived at the Auckland International Airport, where it was collected by staff from the Blood Products Department of the Auckland Regional Blood Service. As we were in the process of purchasing a Cryo-shipper, the arrival of cord blood in an MUE Dry shipper gave us the opportunity to ascertain its suitability for our purposes.

After storage in our Liquid Nitrogen facility the cord blood was thawed and washed according to the New York protocol and its

infusion led to successful engraftment.

The case history will be presented, followed by a description of the cryo-shipper and the preparation of the cord blood for infusion.

**Hepatitis G Virus and its Implications for the Safety of the Blood Supply**
**David Harte**
**Kenepuru Science Centre**
**Institute of Environmental Science and Research Ltd, Porirua**

The detection of known hepatitis viruses by enzyme immunoassays and molecular techniques still leaves unidentified other hepatotrophic viruses responsible for acute and chronic liver disease. Studies in the USA have reported as much as 18% of community-acquired hepatitis and 12% of post-transfusion hepatitis are unrelated to infection with the known hepatitis viruses (hepatitis A, B, C, D and E viruses). Even after eliminating known hepatitis viruses, autoimmune disease, drugs and metabolic disorders, the aetiological agent(s) in unexplained cases of cryptogenic hepatitis, cirrhosis and fulminant hepatitis has remained unidentified, although the evidence often suggested a blood-borne virus.

Recently, investigators from Abbott Laboratories and Genelabs Technologies have independently identified and partially characterised a new blood-transmissible RNA virus. This virus has been provisionally named the GBVC agent by the group at Abbott Laboratories and hepatitis G virus (HGV) by the group from Genelabs Technologies. Since molecular characterisation of these two agents shows them to be extremely closely related, they are now regarded as two isolates of the same virus.

The discovery of HGV may help unravel some of the enigma associated with the identity of an aetiological agent responsible for some cases of non-A, non-B, non-C, non-D, non-E (non-A-E) hepatitis. It has also been reported responsible for cases of fulminant hepatitis and aplastic anaemia. To date, the full disease implications of HGV infection have not been determined, although the virus is purported to cause both acute and chronic liver disease.

The disease significance of HGV infection is still open to conjecture.

**Prevention of Transfusion Related Endotoxic Shock Caused by Yersinia Enterocolitica – A New Approach?**
**CJ Kendrick**
**Department of Microbiology and Genetics**
**Massey University**

The high incidence of gastrointestinal (GIT) pathogen *Yersinia enterocolitica* in the NZ population has contributed to a growing number of cases of transfusion related endotoxaemia in NZ. With a rate of approximately 1-2 cases per year since the first reported case in 1991 the incidence far exceeds rates reported in other countries. To date there have been 10 known examples of unit contaminations. In most cases the discovery followed the transfusion of infected blood. In two other cases the discovery was made after visual unit examination at the completion of the refrigerated shelf-life.

Endotoxic shock caused by *Y. enterocolitica* currently represents the greatest known danger for recipients of blood transfusions in NZ. The introduction of donor GIT symptom questioning and short dating of the blood supply in some centres have most likely reduced the total number of cases but have failed to prevent further examples.

One of the difficulties that transfusion laboratories are faced with is the inability of traditional laboratory procedures to provide a measure of safety. Recent investigations conducted at Massey University have demonstrated the potential for the use of an antibody screen to identify blood donors currently infected with pathogenic strains of *Y. enterocolitica*. The findings of the pilot study and further developments into this new approach to prevention are presented.

**Overview of Bone Marrow Transplantation**
**Associate Professor John Carter**
**Department of Haematology, Wellington Hospital**

There are a number of conditions where high dose chemotherapy followed by infusion of haematopoietic stem cells is the treatment of choice. Such conditions include aplastic anaemia, the acute leukaemias, certain inborn errors of metabolism and a number of solid tumours. The source of stem cells may be allogeneic or autologous and may be harvested from the donors bone marrow or increasingly frequently from the blood following mobilisation procedures to shift stem cells from the bone marrow into the peripheral circulation. The principles of bone marrow transplantation will be outlined and results of this treatment illustrated by recent international data from the International Bone Marrow Donor Registry.

**HLA – Transplantation**
**John Dagger**
**Technologist in Charge, Tissue Typing Section**
**Wellington Blood Service**

Donor selection for allogeneic bone marrow transplantation is based on HLA (Human Leucocyte Antigen) identity between donor and recipient.

An overview of the HLA system, methods of antigen definition, problems associated with donor selection will be presented.

**Molecular Techniques in HLA Typing**
**Zlatibor Velickovic**
**Department of Pathology, Wellington School of Medicine**

Development of molecular biology techniques in the last decade has led to a variety of new methodologies being implemented in tissue typing. Major breakthrough came with PCR (Polymerase Chain Reaction) which is now widely used in tissue typing laboratories worldwide. PCR based tissue typing methods performed in our laboratory are PCR-SSP, PCR-SSO and Sequencing based typing.

Sequence specific oligonucleotide probing of PCR products (PCR-SSOP) uses polymerase chain reaction (PCR) to amplify the part of a gene that is most polymorphic. Amplified PCR product is electrophoresed and transferred to a membrane. Labelled oligonucleotide probes specific to the polymorphism of the gene tested are then hybridized with the DNA. Detection of the labelled probe shows presence of a specific HLA type.

Sequence specific primers PCR (PCR-SSP) typing uses primers which will amplify only one specific allele sequence if present. Typing one sample requires a large panel of primer pairs. PCR products are separated on a gel. Detection of a band gives the typing result.

Both PCR SSOP and PCR SSP are standard methods currently in use by tissue typing laboratories. From a large study it has been concluded that more conventional typing must be interpreted with extreme caution with less than 28% of matched samples actually being so when measured by more recent methods. Both PCR SSOP and PCR SSP methods, however, although very specific, can detect only polymorphisms already known and these are mostly designed for Caucasian typing, new alleles are not detected. The definitive method overcoming such problems is sequence based typing (SBT). PCR

primers specific to the polymorphic region of the gene of interest are designed and PCR is performed. Products are visualized on a gel and then sequenced automatically. Sequencing is the most powerful method available for typing and gives a definite result so that all polymorphisms (including unusual or previously unidentified ones) can be identified. We are fortunate to have access to sequencing materials currently in development by Applied Biosystems (ABI) for eventual commercial release, which have enabled us to carry out this method of typing for loci of the Class I I HLAs in our current samples and which enable us to sequence Class I alleles.

**New Zealand Bone Marrow Donor Registry**
**Associate Professor John Carter**
**Department of Haematology**
**Wellington Hospital**

High dose chemotherapy followed by haemopoietic progenitor cells support is the treatment of choice for a number of conditions. In some situations the use of autologous stem cells is appropriate whereas in others an allogeneic donor is desirable. Unfortunately only between 20 and 30% of transplant eligible patients will have a fully matched allogeneic sibling meaning the others are without potential bone marrow donors. The use of matched unrelated donors as a source of stem cells is increasingly being used internationally and as a result worldwide there is expansion of donor registries to supply such donors. These have significant implications in terms of cost, BLA tissue typing and transplant outcome. More recently the use of matched unrelated donor cord blood stem cells has been generating interest. The role of registries and the transplant outcomes following transplants from unrelated donors will be reviewed and the development of the New Zealand Bone Marrow Donor Registry described.

**Serological Testing for Bone Marrow and Peripheral Blood Stem Cell Transplantation**

**Jane Humble**
**Serology Laboratory Microbiology Department**
**Wellington Hospital**

There are three areas of the BMT process involving Serological testing by our laboratory.

1. Pretransplantation testing for infectious diseases which may require therapy, including latent infections which may be reactivated following the use of immunosuppressive agents.
2. Evaluation of potential donors for latent or active infection which may preclude the use of the donor or provide useful information about the risk of reactivation of an infection.
3. Diagnosis and monitoring of post-transplantation infections. Tests routinely performed in our laboratory are HBsAg, Anti-HCV, Anti-CMV IgG and Anti HIV1 and Anti HIV2.

CMV infection causes us the most problems and the challenge is to find useful markers of acute/reactivated CMV infection.

**Infections in Bone Marrow Transplant Recipients**

**Dr M.W.Humble, BM,BCh,FRCPath,FRCPA.**
**Consultant Clinical Microbiologist**
**Wellington Hospital**

There are three time periods within which most infections related to Bone Marrow transplantation occur:

1. First Month Before Engraftment
   The major risk factors for infection include neutropenia and damaged mucosal surfaces due to pre-transplant chemoradiotherapy. The principal infections include Bacteremia and reactivated Herpes Simplex Virus infection.
2. Two-Three Months After Engraftment
   During this period there is profound impairment of both humoral and cellular unity. This is enhanced by the occurrence of Acute Graft-Versus-Host Disease (GVHD), which is the major risk factor for infection. In the presence of Acute GVHD, life-threatening infections such as Cytomegalovirus Interstitial Pneumonia and Pulmonary Aspergillosis may occur.
3. Four-Twelve Months After Engraftment
   Gradual recovery of immune function occurs during this period. The major risk factor for infection is Chronic GVHD, which may cause significant delay in immune recovery. Infections related to chronic GVHD include Varicella-Zoster Virus infection and respiratory tract infection caused by encapsulated bacteria (e.g Streptococcus pneumoniae, Haemophilus influenzae type b ).

**Peripheral Blood Stem Cell Overview**

**Dr Ken Romeril**
**Department of Haematology**
**Wellington Hospital**

Peripheral blood stem cell transplantation (PBSCT) is a general term referring to transplantation of unknown quantities of blood-derived true pluripotent stem cells and/or committed clonogeneic progenitor cells and/or postprogenitor cells. The term blood cell transplantation (BCT) is probably preferable to PBSCT.

There is convincing evidence that BCT may produce long-term engraftment in the recipient after conditioning regimes that include total body irradiation and that are considered myelo-ablative. The quality of the graft may be influenced by such factors as prior chemotherapy and radiotherapy treatment the patient has received, the age of the patient and other factors such as cytokines used for recruitment and the timing of cell collection,

BCT following successful mobilisation of progenitor cells results in faster reconstitution of neutrophils and platelets and is significantly less costly than autologous BMT. BCT is now the preferred method of transplantation in lymphoma, myeloma and breast cancer therapy with increasing, although not proven, use in chronic myeloid leukaemia.

There was an expectation that BCT may improve survival because of less tumour contamination compared to BMT. However, although there is evidence of less tumour contamination, malignant cells (eg. myeloma) can still be reinfused into the patient. Various methods such as CD34 positive selection are being trialled to reduce tumour cell contamination in the autograft.

BCT is a rapidly developing new technology and has allowed the use of ex vivo 'expansion' of stem cells and gene marking/gene therapy techniques. Allogeneic BCT is also gaining popularity as it offers donors a less invasive procedure to collect progenitor cells.

**CD34 Analysis: An Indicator of Stem Cell Numbers**

**Jan Nelson**
**Molecular Haematology Laboratory and Transplant Research Centre Auckland Hospital.**

Haematopoietic stem cells from bone marrow, cord blood or peripheral blood have the potential to reconstitute the bone marrow after myeloablative chemotherapy or irradiation. Peripheral blood is now the preferred source of stem cells in autologous transplantation for patients with haematological and other malignancies, with successful engraftment dependent on adequate numbers of stem cells. Indirect assay methods for the haematopoietic stem cell include total mononuclear cells counts, the traditional cell culture progenitor

assay for CFU-GM numbers and more recently, estimation of CD34 positive cells. Stem cell numbers in steady state peripheral blood are low (< 0.5%) but can be mobilised with cytokines eg. G-CSF, chemotherapy or a combination of both. CD34 is a protein on the surface of haematopoletic stem /progenitor cells and flow cytometric analysis is a rapid and reliable method of determining numbers in peripheral blood and apheresis products. Cells are stained with a monoclonal antibody to CD34 conjugated to a fluorochrome and the percentage of positive cells is determined from flow cytometric plots which delineate a population of cells with both positive fluorescence and low granularity (side scatter). Results are available in less than 2 hours and this provides a means of daily monitoring the peripheral blood for a rise in CD34 positive cells and an indication as to when apheresis is appropriate. The Auckland BMT programme utilises a strategy of cyclophosphamide 2g/m· followed by rhG-CSF 5Mg/Kg/day to mobilise peripheral blood stem cells with leucapheresis performed on a Fenwall CS3000 cell separator when the white count rises after the nadir. CD34 numbers are monitored in the peripheral blood as the white cell count rises (>5 x $10^6$/L ) approximately a week (Day 7 or 8) after the cyclophosphamide dose. This protocol produces a predictable rise in CD34 positive cells and adequate numbers (>20 per ml) are present for a period of 3 to 4 days in the majority of cases. Analysis of leucapheresis products shows a good correlation between peripheral blood CD34 positive cells and apheresis CD34 and CFU-GM numbers. The introduction of PBSC transplantation has resulted in an increased role for the laboratory in monitoring blood samples prior to apheresis, evaluation of the product infused into the patient and minimal residual disease. Results from our laboratory indicate that the ability to monitor CD34 positive cells in peripheral blood has provided a valuable indicator for the optimum time for collection and number of leucaphereses required.

**Stem Cell Processing – Collection Techniques**
**Joanna Delahunty**
**Staff Nurse – Oncology/Haematology Ward**
**Wellington Hospital**

This presentation will cover the process of collection of peripheral blood stem cells.

Prior to collection the patient will have been primed with a single dose of chemotherapy and a 7 - 10 day course of G-CSF (granulocyte colony stimulating factor) to stimulate the bone marrow to produce higher numbers of stem cells in preparation for the collection.

The patient is connected to the apheresis machine via either a central venous catheter or peripheral vein needles. Their total blood volume is circulated 2 - 2½ times through a centrifuge with the white blood stem cells being collected and the other blood components being returned.

**Cryopreservation of Haemopoietic Stem Cells**
**Glennis White**
**Immunology/Cryopreservation Laboratory**
**Wellington Hospital**

Cryopreservation of haemopoletic stem cells is a technique which has rapidly evolved from a research concept into a standard therapeutic tool.

Using this technique, a population of cells can be stabilised by subjecting them to cryogenic temperatures (below -140°C), enough to block all the enzymatic pathways and stop cellular metabolism.

The most dangerous events for the preservation of viability take place during freezing and thawing stages, where transformation of a liquid to a solid state and vice versa occur. Therefore, a cryoprotective agent is added to protect the cells during the freezing process. A relatively slow controlled rate of freeze provides reproducible standard cooling conditions.

Rapid thawing of cells is desirable. Once thawed the stem cells must remain cool. They must be infused into the patient immediately to minimise DMSO toxicity which is temperature dependent.

The ability of the cryopreserved stem cells to regenerate haemopoiesis is demonstrated by in-vitro CFU-GM cell culture assays. The CFU-GM assay gives a reliable indicator of the viability and quantity of frozen cells to be transplanted.

**Nursing a Transplant Patient**
**Leonie Johnson**
**Charge Nurse, Ward I**
**Wellington Hospital**

Bone marrow transplant patients often find the experience daunting and nurses need to provide psychosocial support while performing the physical and technical cares necessary. The patient may be nursed in isolation with limited visiting. Their looks often change, they have continuous IV feeding, antibiotics, morphine, blood products and fluids. Regular monitoring of their condition is vital, as it is often the nurse who will pick up the first change.

**Blood Product Support**
**Dr Chris Hogan**
**Medical Director**
**Wellington Blood Service**
**Wellington Hospital**

The blood product support of patients under-going transplantation procedures is becoming increasingly complex and resource-intensive. Issues including HLA allo-immunisation, transfusion-related graft-versus-host-disease, and the transmission of cytomegalovirus or other infections by transfusion require particular strategies. Such measures include leukodepletion, blood product irradiation and the provision of HLA matched cellular products. These topics will be discussed.

**Cyclosporin Measurement**
**Russell Cooke PhD**
**Biochemistry**
**Wellington Hospital**

The immunosuppresive drug Cyclosporin has had a major impact on transplantation medicine since it was first introduced fifteen years ago. Its role in renal, cardiac, liver and bone-marrow transplantation is well established and it is now being used in the treatment of auto-immune diseases. It is a cyclic polypeptide derived from the fungus *Tolypocladium inflatam.* Unfortunately however, it also has a number of major side-effects including nephrotoxicity, hypertension and hepatoxicity. Thus some form of therapeutic monitoring became a necessity. However, appropriate cut off points have not been easy to elucidate. It is now recommended that Cyclosporin be measured by a specific assay (HPLC or immunoassay) on whole blood taken just prior to a dose 'trough level'. Various aspects of the monitoring of blood cyclosporin levels will be discussed.

**Studies in Chemotherapy Resistant Genes in Leukaemia**
**Philip Wakem**
**Haematology Laboratory**
**Wellington Hospital**

There is clear evidence that resistance to chemotherapeutic agents has significant negative prognostic significance for patients with either de novo or relapsed leukaemia.

There is accumulating evidence that the use of assays to measure leukaemia cell chemoresistance and therefore the expression of chemotherapy resistance genes has clinical utility.

It is proposed that based on a review of the literature, appropriate methodologies for assaying chemotherapeutic resistance in leukaemia cells will be established.

These will include a functional assay of chemotherapeutic metabolism in the cell (eg. Rhodamine 125 dye exclusion) and also cell protein labelling studies which serve as markers for the transmembrane chemotherapy pump, ie. monoclonal antibodies, C219, 4E3 and UC12 and MRK16. Cell culture viability testing after subsequent exposure to a chemotherapeutic agent, (ie. Adriamycin) will be considered the reference standard procedure.

These studies will have implications for determining the choice of assay for routine clinical use to guide chemotherapy treatment decisions in individual patients, and the use of resistance modulators.

**Molecular Monitoring of Minimal Residual Disease**
**Peter Hollings**
**Hospital Scientific Officer, Genetic Services Wellington Hospital**

Bone marrow or stem cell transplantation is now the preferred treatment for younger patients with leukaemia who have HLA compatible donors. Fortunate patients are cured of their disease by this treatment, but others relapse, sometimes years after transplantation, due to the re-emergence of the leukaemic clone.

Much effort has gone into devising methods to detect and quantify minimal residual disease (MRD) in transplant patients. Knowledge gained by these methods could improve therapeutic strategies by identifying patients who are likely to relapse and who may therefore benefit from more intensive treatment, and by identifying patients who may have been cured of disease and who could benefit from less intensive treatment.

Techniques used for studying MRD can be broadly categorised as morphologic, immunologic, cytogenetic or molecular. Molecular techniques based on the use of the polymerase chain reaction (PCR), are vastly more sensitive than other methodologies and can identify one leukaemic cell in a population of a million normal cells.

The prognostic significance of molecular monitoring of MRD will be discussed with regard to transplant patients whose leukaemias are characterised by the recurring translocations t(9;22), t(15; 17) and t(8;21).

**Dendritic Cell Biology and Application as Anti-Cancer Therapy: Promise, Problems and Progress**
**Dr Ian Hermans**
**Wellington Clinical School**

The place of immunotherapy for the treatment of cancer has held scientific interest for some 30 years. The detailed (but still incomplete) complexities of the immune system are now well described and as a consequence new approaches to anti-cancer immunotherapy are being developed.

Considerable focus has been placed on activating the immune system (particularly cytotoxic T lymphocytes) by utilising tumour derived peptides directly. This approach has had, at best, mixed results.

T cells require more than antigen alone in order to become functionally activated. It is for this reason that considerable attention now falls on the role of antigen presenting cells, specifically Dendritic Cells (DCs).

The biology, function and application of DCs will be discussed in addition to the results of the DC based experiments undertaken by the Malaghan Institute of Medical Research.

**Fructosamine to HBA1c – A Transitional Experience in Diabetes Monitoring**
**Gerard R Verkaaik FNZIMLS, Peter J Moore, MNZIMLS**
**Marlborough Medical Laboratory**
**Wairau Hospital, Blenheim**

This paper follows the same group of diabetics presented at last year's conference.

For the last ten years, patients in Marlborough had been monitored by Fructosamine assay, on the basis of better reproducibility through automation relative to the manual HBAIc methods of the day.

With the advent of more reliable HBAIc assays, a comparative study of Fructosamine and HBAIC was undertaken with a view to reducing the frequency of follow-ups inherent in a Fructosamine based monitoring programme (monthly recall).

The study showed a significant difference between the two glycation monitoring systems. All three diabetic subgroups appeared to be under better control according to the fructosamine assay results than that demonstrated by the HBAIc assay.

This paper updates the observations on the same patients, one year after the change in monitoring systems was investigated, and also makes some comparisons between three HBAIc assay systems currently available.

**Implementing the RHA Draft National Quality Standards for Medical Testing Laboratories for Glucose Near Patient Testing**
**Clare Murphy**
**Wellington Hospital**

For some years the author and the diabetes nurse educator have seen the need to review the practice of glucose POCT/NPT at Wellington Hospital. Although the system in place was state-of-the-art when it was introduced, it was well past its prime in 1996. More important, there was no associated QC or QA programme.

An opportunity arose when a decision to replacement of the reflectance meters with electrochemical meters was needed. A quality improvement team of diabetes nurses, clinicians, charge nurses and laboratory staff was convened to look at the issues. The team first assessed all electrochemical meters on the market using data from literature, previous trials and knowledge of the companies involved.

The availability of the Medisense Precision G glucose meter with on-board QA facilities changed our whole way of looking at the project. We trialled this system and the BM Accudata glucose testing system in a busy medical ward, and chose the Precision G.

The implementation was held up for six months awaiting final approval and finance. Training over 400 staff, including key operators, over all shifts was a logistics nightmare. The diabetes nurse educators did the scheduling and Medisense/Medica Pacifica Staff did the training. Staff at our two hospital sites were trained in two blocks Kenepuru, gaining greatly from our experience in Wellington.

The success of implementation depends a great deal on training and follow-up. This has required time and commitment from both Capital Coast Health and Medica Pacifica. The nature of the Precision G QA system means we have had no problem with QC non compliance. However, it has proved more difficult than we thought to get users to identify themselves correctly when using the meter. We still have areas that are not on the system but they are low use or have special needs. Customised QA systems are being introduced for

these areas.

Overall we have been extremely happy with the QA program and could not have achieved the success we have had in implementing the RHA Draft National Quality Standards without the Precision G System.

**Maternial Serum Screening Update '97 – User Pays**
**Mary Stuart, Dennis Dixon-McIver, Bruce Knox, Dianne Webster**
**Laboratory Services, Auckland Healthcare**

**Introduction**

A pilot maternal serum screening (for chromosome abnormalities and neural tube defects - NTDS) program for women in the North Health region was ran from October 1994 to October 1996. It was not possible to secure continued RHA funding in spite of RHA enthusiasm for the final report, so the program moved to a 'user-pays' basis from November 1996. The cost of the test was $120. Coincident with this was a change in the risk calculation algorithm used from SAMSAS to αlpha, with the same analytes (AFP, $uE_3$, α-hCG and βHCG.

**Results**

Using annualised data, in the pilot program 2046 women under 35 were screened and 521 women over 35, under user pays this has dropped to 507 women under 35 and 306 over 35. The recall rates for chromosome abnormality are 13% and 14% and for NTD screening 1.4 and 1.6%. Under both schemes 94% of women with positive chromosome abnormality screens accept diagnostic testing (amniocentesis and karyotype). The screening found 5 NTDS, 2 trisomy 21s, 4 trisomy 18s, 6 other chromosome abnormalities, 2 cases of steroid sulphates deficiency, 8 sets of unsuspected twins and 6 unsuspected fetal deaths. Three cases have been missed, one each of NTD, trisomy 21 and trisomy 18. Repeat testing confirmed the original laboratory results and risk assessment. A phone survey indicated that 19 of 20 women who had serum screening would have had amniocentesis or chronic villus sampling if maternal serum screening wasn't available (and this would be at no charge).

**Discussion**

With the introduction of 'user-pays' there has been a sharp reduction in the number of women screened, especially women under 35. Both schemes reduced the overall number of amniocenteses done since a higher proportion of women over 35 than under 35 are screened. We continue to lobby for RHA funding for the program.

**Hypokaleamic Responses to Intravenous Salbutamol Between Subjects with Two Genetic Polymorphism's of the β2 Adrenergic Receptor**
**R Siebers, D Balfe, N Lever, F Stewart, C Burgess, R Beasley.**
**Wellington Asthma Research Group**
**Wellington School of Medicine**

**Introduction**

Studies of polymorphism's in patients with asthma have demonstrated substitution of arginine (Arg) by glycine (Gly) at the 16th amino acid position from the amino terminus in the majority of severe corticosteriod dependent asthmatics. In-vitro studies have demonstrated a greater level of agonist induced, β2 adrenergic receptor down regulation associated with this Gly 16 polymorphism compared with the Arg 16 polymorphism. We have tested whether there is in-vitro support for increased agonist induced β2 adrenergic receptor down regulation associated with the Gly 16 polymorphism.

**Methods**

Eight subjects with the Gly I6 polymorphism and eight with the Arg I6 polymorphism were investigated in a randomised double blind trial. Salbutamol (10 μg/kg body weight) was infused over a 5 min period prior to, and after 2 weeks of inhaled salbutamol (1600 μg/day). At the end of, and at 5, 10, 20, and 30 min after the infusion plasma K+ was measured as a β receptor response. Within-subject and between-group comparisons were made by analysis of variance.

**Results**

Maximal mean hypokalaemic responses occurred 20 min (T20) post-infusion. Delta K+ changes at T20 were essentially identical for the Gly I6 and Arg I6 polymorphism's; these being -0.89 mmol/ L (sd: 0.21) and -0.88 mmol/L (0. 15) respectively at the first visit. After 2 weeks of inhaled salbutamol the T20 delta K+ changes were -0.71 mmol/L (0.15) and -0.71/ L (0.17) respectively for the Gly I6 and Arg I6 polymorphism's. Delta K+ differences were also not significantly different at the other time points, both prior to and after 2 weeks of inhaled salbutamol.

**Conclusions**

Unlike in-vitro there is no evidence of enhanced in-vivo agonist induced β2 adrenergic receptor down regulation associated with the Gly I6 polymorphism.

**Cell-Dyn 4000 Evaluation**
**D Spedding, C Zorn**
**Department of Haematology**
**Auckland Healthcare**

An evaluation of the newly released Abbott Diagnostics Cell-Dyn 4000 was performed in our laboratory. The system was compared with our existing H*1, H*2 systems and areas in which Abbott's previous machine CellDyn 3500 fell short in our 1995 evaluation were targeted.

We ran the system in parallel to the H*1, H*2 comparing speed of throughput, handling of urgent samples, evaluation of primary and secondary modes, frequency of repeats, down time, routine maintenance. ease of calibration and equipment failure.

To compare flagging for left shift, blast cell and variant lymphocytes and to assess the accuracy of these, 400 cell manual differentials were performed on 259 blood films.

Comparative studies were performed for automated Reticulocyte and Nucleated red cell counts and manual counts.

We found that the Cell-Dyn 4000 performed better than the 3500 in all those areas that we had found to be deficient, and that it has demonstrated the ability to cope with large volumes of work including abnormals. The analyser is user friendly and while being used regularly required little maintenance.

The Cell-Dyn 4000 represents significant advance in haematology instrumentation and has the potential to expand haematological investigation.

**Analyser Selection – More Than Cost Comparison**
**J Kendall**
**Wanganui Diagnostic Laboratory**

**Introduction**

A discussion about the value of the CHCM when comparing Haematology analysers led to our investigation of a paper from Westmead Hospital.

**Method**

Calculations were entered into our computer system to check results.

**Results**
Discrepancies were found between the calculated and actual Haemoglobin result. This exercise also highlighted the incidence of hypochromia in our population.

**Discussion**
Different analysers have advantages and disadvantages. Selecting an analyser that suits your patient population rather than a budget is likely to be increasingly challenging.

### The StaRRsed ESR Analyser

**Jackie Crane**
**Medlab Auckland**

The StaRRsed is an automated closed sampler ESR analyser developed in Holland.

The analyser aspirates 1.7 ml EDTA blood by means of a closed vial sampler. The blood is mixed with diluent (Tri Na Citrate) and automatically drawn up to a column height of 200mm in one of 120 Westergren sedimentation tubes mounted in a rotating carousel. As the aspirate cycle for one sample finishes the carousel rotates to allow another tube to be filled from the next sample. The tubes are presented to an infra red reading device which is reported as a corrected ESR. The tubes are automatically washed and dried ready for reuse.

The StaRRsed has previously been shown to produce results which compare well with those produced by an ICSH selected Westergren method. It offers considerable benefits in consumable savings, health and safety, improved workflow with results being downloaded directly to the Laboratory Computer system.

The establishment of the 30 minute StaRRsed ESR method will be discussed and our initial trials comparing StaRRsed, Diesse and Westergren methods. I will also report on daily and monthly maintenance, on going quality control, the benefits in consumable savings, turn around times and an overall assessment of the performance of the StaRRsed after one year of routine operation in a large community Laboratory.

### Sedimatic: 100 MM Tube Performance for Erythrocyte Sedimentation Rate (ESR)

**Janene Madgwick, MNZIMLS**
**Haematology Department**
**Laboratory Services Auckland Healthcare**

Sedimatic is an automated Erythrocyte Sedimentation Rate reading system. Whole blood samples, collected into 100 mm Sedimatic collection tubes, are mixed on the Sedimix and identified with a barcode scanner connected to the main instrument of the system to which the tubes are transferred in racks. The system offers Quick Mode which allows results to be printed after 30 minutes. The purpose of this evaluation was to investigate the manufacturer's claim that ESR results using the Sedimatic system correlate better with the Westergren method than other systems which also use tubes shorter than the 200 mm Westergren type.

Results from Sedimatic 100 versus Westergren method and from Vesmatic versus Westergren are presented.

### When is Haemoglobin F Not Haemoglobin F?

**Mandy Wood, Dr George TC Chan**
**Department of Haematology**
**Laboratory Services Auckland Healthcare**

The Bio-rad Variant B thalassaemia Short Program is a fully automated solution for B thalassaemia testing. It provides quantitative results for HbA2 and HbF. The analyser utilises the principle of ion exchange high performance liquid chromatography or HPLC.

When analysing normal Variant chromatograms several haemoglobin peaks are observed. Those being HbF, P2, P3, HbA and HbA2. The P2 and P3 peaks are minor peaks associated with HbA.

Diabetics tend to exhibit elevated P2 peaks which is due to the presence of glycosylated haemoglobin or HbAlc.

According to the documentation regarding the Variant B thalassaemia short program the P2 peak and the HbF peak are two distinct peaks that are easy to distinguish from each other.

In practice however using the routine set up recommended by the manufacturer sometimes the Hbf peak merges with the P2 peak and the combined peak is reported as HbF by the Variant resulting in a spuriously high HbF level.

Any lab using this instrument should be aware of this occurrence and devise a protocol to confirm a high HbF level obtained by the Variant.

### Platelet Count, MPV, MCHC – Fact or Fiction

**Steve Schischka**
**Laboratory Services**
**Auckland Healthcare**

Platelet count, MPV and MCHC are subject to interference by many factors resulting in erroneous results.

Technologists must be aware of these interferences and the limitations of modern analysers.

### Effects of Storage on Coagulation Testing

**Xiao Chen**
**Diagnostic Laboratory**

It has been known for some time that the storage conditions will affect the coagulation tests.

This study has been performed to evaluate the effect of storage conditions on Prothrombin Time (PT), International Normalized Ratio (INR) and Activated Partial Thromboplastin Time (APTT). Blood was collected from warfarinised patients to test PT and INR. APTT was tested on coagulation screen patient's specimens. All samples were stored at five different storage conditions before they were measured by an MLA Electra 1000 Coagulometer. The results show that there was no clinically significant difference in the PT from 4 storage conditions compared with the baseline. The APTT was markedly prolonged when the plasma was stored at room temperature (RT) or at 4°C in polypropylene tubes for 24 hours. However, there is no clinically significant change in whole blood at RT 24 hours or plasma stored at -20°C 24 hours.

This study indicates that INR and APTT results are valid on whole blood stored at RT 24 hours or a plasma stored at -20°C 24 hours.

**Key Words:**
Blood Coagulation Testing, Activation, Specimen Storage, Prothrombin Time, Activated Partial Thromboplastin Time.

### New Platelet Function Analyser (PFA)

**Jackie Williams**
**Middlemore Hospital, Auckland**

Middlemore Hospital Laboratory had the opportunity and the funding to evaluate and if appropriate purchase a platelet function analyser. The Haematology Department does about 250 bleeding times per annum and we thought that the PFA would replace this time consuming and inaccurate test.

The evaluation was brief but on going as the bleeding times are not done frequently enough for a good trial and the procedure is invasive. However, comparisons were made between the two methods.

The results that we have obtained to date are very good and we are now using the PFA routinely to screen for possible bleeding problems pre surgery and also to exclude aspirin ingestion.

The presentation will outline the reasons for the PFA evaluation, what testing we did, what type of patients we normally would do the test on, what the test can predict.

**Discrepancies in the INR Caused by Lupus Anticoagulant**
**John Pountney**
**Haematology Department**
**Medlab North Shore Hospital, Auckland**

A case report will be presented of a 77 year old male on warfarin therapy whose INR was being measured using a recombinant thromboplastin - Dade's Innovin. The warfarin was discontinued but the INR stayed in the range of 4.0-4.5.

When the INR was tested at another laboratory, the result was 1.4. Subsequent investigations to find the cause of this discrepancy revealed the presence of a strong lupus anticoagulant. The patient has now re-started warfarin therapy which must be monitored using a biological thromboplastin.

Similar cases have been reported both in New Zealand and overseas and some authorities are recommending that Innovin should not be used in patients with lupus anticoagulant when monitoring anticoagulant therapy.

**Intracranial Haemorrhage – A Case Presentation**
**A J Day, A Lee**
**Department of Haematology**
**Auckland Hospital**

The incidence of ICH in neonates with severe or moderate haemophilia is reported as 1-4% and the outcome is often catastrophic. The occurrence of major ICH in three of twelve births in New Zealand in the past two years has prompted review of current practice and development of national guidelines for obstetric management and perinatal care of affected infants.

Two of the neonates, all of whom were full term, had traumatic deliveries (breech plus forceps and vacuum extraction). All had a family history of haemophilia but this was unknown at one delivery. Presenting features (days 4,7,7) were of irritability, poor feeding and floppiness. One child has since died and two others have neurological deficits.

These cases underline the need for better carrier identification, recognition of neonates at risk after birth trauma and education of parents, staff and family practitioner about early signs of ICH.

This case is one of a child that was not known at the time to have a family history of haemophilia. Even though he was diagnosed as having an ICH the treatment was unacceptably delayed through a misunderstanding of the clinical situation.

Ths is an example of the need for good communication between laboratories assisting in the diagnosis of a serious haemorrhagic defect.

**Core Laboratory Panel Discussion**
**John Peters and Bernard Chambers, Middlemore Hospital**
**John Sharman, Canterbury Health Laboratories**
**Lorna Gribble, Health Waikato**

John and Bernard propose to give a short presentation about the changes that have occurred at Middlemore Laboratory followed by a panel discussion on the topic of core/central laboratories.

The Haematology and Clinical Chemistry staff at Middlemore Laboratory were asked to look into the feasibility of moving the current Haematology equipment and staff into the space occupied by the Clinical Chemistry department. The reason for such a proposal was:

a. To make cost savings.
b. To test out the concept of a core laboratory for a future laboratory yet to be built.

A system known as process mapping was implied to identify similar processes and to identify steps required in the processes. Power, gas, heating, cooling, bench space, computer requirements were all investigated. We established early on that we were going to be very short on space and that we were against the proposal, but this was to no avail and we were instructed to get on with the job and basically make the core laboratory happen. Our system for specimen registration was looked into and recommendations made. To this end we worked hard to make the best of what we had knowing that we had a very limited budget about $100,000 and that it would be difficult for all of the staff.

The result of this amalgamation although in its infancy has been a much more crammed work environment for the two departments. The specimens registration area has been markedly improved and is functioning very well but has more changes to be done in the future.

We will invite everyone present to participate in a panel discussion about the concepts, pro's and con's of core laboratories.

**CD80 Co-Stimulation is Essential for the Induction of Airway Eosinophilia**
**Nicola Harris, Robert Peach, Joe Naemura, Peter Linsley, Graham Le Gros and Franca Ronchese**
**Malaghan Institute of Medical Research**
**Wellington School of Medicine**
**Bristol-Myers Squibb, Pharmaceutical Research Institute, Seattle, Washington 98121**

**Introduction**
T cell activation requires the recognition of antigen by the TCR and the delivery of costimulatory signals generated by accessory molecules. CD80 and CD86 (B7-1 and B7-2) are the ligands on Antigen Presenting Cells (APCs) which bind CD28 and deliver the costimulatory signals necessary for T cell activation. The reasons for the existence of two CD28 binding molecules are not well understood. To investigate the role of CD80 costimulation in T cell activation we created a mutant version of CTLA4-Ig which could selectively bind CD80 and block CD28-CD80 interaction but leave CD28-CD86 binding intact.

**Methods**
Mice were immunised ip with 2 $\mu$g OVA on day 0 and 14, followed by intranasal administration of 100 $\mu$g OVA on day 24. A bronchoalveolar lavage (BAL) was performed 4 days later and the cellular content of the BAL fluid analysed. Antigen induced serum antibody production and blood eosinophilia were also monitored.

**Results**
CD80 blockade prevented antigen-induced accumulation of eosinophils and lymphocytes in the lung but did not block antigen induced systemic blood eosinophilia or IgE production.

**Discussion**
Our results indicate that CD80 costimulation is not necessary for the

induction of Th2 immune responses but rather for the maintenance or amplification of local inflammatory responses.

**CTLA-4 Blockade During a Mycobacterial Infection**
**Joanna Kirman, Kathy McCoy, Graham Le Gros.**
**Malaghan Institute of Medical Research**
**Wellington School of Medicine**

**Introduction:**
The interaction of CTLA-4 with its ligands CD80/CD86 is thought to negatively regulate T cell activation. By blocking this negative signal *in vivo* using a neutralising antibody to CTLA-4 it could be possible to enhance an immune response leading to increased protection. We investigated the effect of CTLA-4 blockade in a chronic Th 1 -type infection, using a murine model of Mycobacterial lung infection.

**Methods:**
C57B1/6 mice were intranasally infected with *Mycobacterium bovis* BCG and were either treated or untreated with anti-CTLA-4 mAb. Cells from the draining mediastinal lymph node and their responses to antigen *in vitro* were examined. The course of infection was followed by viable Mycobacteria counts from organ homogenates.

**Results:**
Blockade of CTLA-4 lead to an earlier response in the draining mediastinal lymph node of BCG infected mice evidenced by an increase in total cell numbers.

Lymphocytes from the draining lymph node proliferated more and secreted more IFN-Y to Mycobacterial antigen *in vitro*. However the kinetics of Mycobacterial growth and clearance *in vivo* was not delectably affected by CTLA-4 blockade.

**Discussion:**
CTLA-4 blockade during a BCG infection in mice lead to an enhanced and earlier immune response, however, there was no detectable effect on the growth or clearance of the infliction. The lack of an effect on the course of infection may be due to the murine immune response to Mycobacteria already being highly efficacious. Enhanced bacterial clearance with anti-CTLA-4 treatment during a Mycobacterial infection might be detectable in a more susceptible host.

**Antiphospholipid Antibody Syndrome: A Case Report and the Use of Anti-β2 Glycoprotein ELISA in Diagnosis**
**Joanne McDonald* and John O'Donnell*+**
***Section of Immunology, Canterbury Health Laboratories and**
**+ Department of Rheumatology, Immunology and Allergy**
**Christchurch Hospital, Canterbury Health Ltd**

The patient, a 26 year old female, presented in May 1992 with a history of dizzy spells, speech disturbance, loss of balance, right hemisensory change and visual obfuscations. She had been diagnosed with juvenile rheumatoid arthritis in August 1981 (age 16). In 1988 she developed a photosensitive rash, thought to be drug related. She was found to be anti DNA antibody positive and ANA positive with mild thrombocytopenia. Her joint symptoms settled. In August 1990 she began suffering recurrent neurological symptoms, for which a CT head scan and carotid angiogram were performed proved normal. In 1991 she suffered a first trimester spontaneous abortion. High titre circulating anticardiolipin antibody and lupus anti-coagulant were detected. In January 1992 she suffered a second first trimester spontaneous abortion. An Echocardiograph revealed a heart valve lesion consistent with Libman-Sacks endocarditis. She was considered to suffer from the anticardiolipin antibody syndrome associated with SLE. Low dose aspirin and subsequently low molecular weight heparin were exhibited without obvious improvement in her intermittent neurological symptoms. She suffered a third pregnancy loss at 23 weeks gestation at which time the placenta was examined and found to be small, with approximately 20% of placental tissue infarcted. In early 1994 she fell pregnant again and was treated with prednisone, delivering a healthy boy following induction of labour at 31 weeks gestation, delivery being precipitated because of growth retardation.

This patient illustrates many of the clinical features of the antiphospholipid antibody syndrome. Recognition of the essential cofactor, β2 glycoprotein required for antibody binding in ELISA for anticardiolipin antibodies has lead to speculation of a pathogenic role for anti β2 glycoprotein antibodies. Our laboratory has identified 10 patients with the antiphospholipid antibody syndrome, as defined by clinical criteria and the presence of anticardiolipin antibodies. Eight of those 10 patients have positive antibodies to β2 glycoprotein. The clinical significance of antibodies to β2 glycoprotein will be discussed, along with potential mechanisms for the induction of a pro-thrombotic state.

**Correlation Between Anti Proteinase 3 Antibodies and ANCA Titre/: A Case Report**
**Mark van Voorthuizen* and John O'Donnell*+**
***Section of Immunology, Canterbury Health Laboratories and**
**+ Department of Rheumatology, Immunology and Allergy,**
**Christchurch Hospital, Canterbury Health Ltd,**

The patient, a 62 year old female, presented in July 1994 with painful, right otitis media and fever unresponsive to oral antibiotics. She had also developed a persistent cough. On admission to hospital she was suffering from a normochromic normocytic anaemia (HB 92g/L) and had a marked serum protein acute phase response (CRP 160mg/L). A chest x-ray revealed multiple pulmonary opacities, some of which were cavitating consistent with Wegener's Granulomatosis. Antineutrophil cytoplasmic antibodies with a classic pattern were detected by immunofluorescence. No significant urinary sediment was identified. A diagnosis of Wegener's Granulomatosis was made and the patient was treated with oral prednisone and pulse intravenous cyclophosphamide therapy. She made a good response with complete resolution of symptoms and x-ray changes. Over the course of 18 months she was weaned completely from all therapy and remained well for a period of approximately 8 months before undergoing a relapse. The relapse was heralded by a feeling of malaise with discomfort in her right ear and night sweats. The ANCA titre had risen. She underwent further therapy with oral prednisone and pulse intravenous cyclophosphamide therapy and again made a good response, however, on ceasing the course of pulse cyclophosphamide therapy she developed stridor and was found to be suffering from significant subglottic stenosis. She was recommended on a higher dose of prednisone and switched to oral cyclophosphamide and continues on this therapy.

This patient illustrates many of the clinical features of Wegener's Granulomatosis. During the course of her illness we have had the opportunity to measure serial titres of classic ANCA and following the development of an anti-PR3 ELISA we have had the opportunity to correlate ANCA titre with anti-PR3 antibody levels. In this patient there was a good correlation between both assays, however, on analysis of 18 other patients with varyinig serial measurements of both ANCA and antiPR3 antibodies, it is clear that it cannot be necessarily assumed that antiPR3 antibodies will correlate with ANCA titre. In addition, clinical disease activity may or may not correlate with one or other or both antibodies. Clinicians should be cautioned against using either test to monitor disease activity, unless they have shown that within a particular individual such a correlation exists.

**Organ and Tissue Transplantation, An Emerging Opportunity For Scientists**

**Shirley Ball, Professor Frank Billson**
**Lions NSW Eye Bank, Sydney Eye Hospital**
**University of Sydney, NSW, Australia.**

Advances in immunology and improving surgical and anaesthetic skills have made possible safer transplantation with good long term prognosis but still with many intricate hurdles.

Organ donation takes place in hospital intensive care settings and is highlighted by the further complication of brain death. Eye and tissue banks have the potential to obtain donors from many more members of the community.

It is the policy of the Lions NSW Eye Bank that the relatives/next of kin of all patients who die in hospitals be asked to consider giving permission for donation of the patient's eyes for the purpose of corneal transplantation unless there is a specific contraindication.

Corneal transplantation is the most frequently undertaken organ or tissue transplant in NSW. The limitation to corneal transplantation at this time is entirely related to a shortage of donors.

Requesting permission for corneal donation from grieving relatives is a difficult procedure, requiring genuine sensitivity. Eyes are suitable for corneal donation up to 12 hours after death; the process involves enucleation of both eyes by suitably trained personnel including doctors and coordinators. Great care is taken not to damage the cornea or the donor in any way. The eyes are examined by slit lamp and specular microscopy and the corneal button is surgically removed from the eyes.

The co-ordinator's role is a difficult but rewarding one; balancing the needs of the recipient with the willingness of donors to donate and the concerns of the grieving families. As the opportunity for transplantation increases, the future for co-ordination agencys such as the Eye Bank means there is an increasing demand for qualified professionals in this area.

**Molecular Diagnosis of Cytomegalovirus Infection and Disease in Bone Marrow Transplants**

**H Antoszewska, R Nagappan, M C Croxson**
**Dept of Virology & Immunology**
**Laboratory Services Auckland Healthcare**

**Introduction**

Human Cytomegalovirus (HCMV) infection is a major cause of mortality and morbidity after bone marrow transplantation.

The virus causes severe complications such as interstitial pneumonia, gastrointestinal disease and marrow suppression. Mortality rate in patients with pneumonitis is still 50-95%.

Antiviral agents such as Ganciclovir and Foscarnet have a clinical benefit either preventing or curing CMV disease. However, these treatments are associated with toxicity. Thus, rapid and sensitive tests for diagnosis of CMV infection and selection patients at risk of developing disease is very important in the management of bone marrow transplants (BMT).

**Methods**

Two PCR assays were developed to detect HCMV.

1. DNA PCR. The assay amplifies sequences coding for viral phosphoprotein 65.
2. RT-PCR. The assay detects messenger RNA for viral protein pp 150.

**Results**

Twenty bone marrow transplants were monitored for CMV DNA using PCR assay. At present, the detection of virus in blood is the most practical and clinically useful prognostic indicator of CMV disease.

**Discussion**

PCR proved to be very specific and a sensitive method for detection of CMV in both peripheral WBC and affected organs. However, not all viraemic patients develop clinical disease.

RT-PCR detects actively multiplying virus. Presence of late structural gene MRNA is a useful marker of CMV disease.

**Clinical Correlation of Antinuclear Antibodies with Rheumatic Disease**

**Mr PG Tustin**
**Charge Scientist Immunology**
**Valley Diagnostic Laboratory, Lower Hutt**
**1Dr WJ Taylor, MBCHB, Rheumatology Registrar**
**1Dr CNA Rajapakse, FRACP, Rheumatologist and Clinical Director**
**1Dr AA Harrison, PhD, FRACP, Rheumatologist**
**1Wellington Regional Rheumatology Unit, Hutt Hospital**

**Introduction**

AntiNuclear Antibodies (ANA) are often found in low titres in the general population which are not associated with ANA related disease. It was proposed to establish a study to determine the clinical usefulness of the ANA in consecutive unselected patients seen at two Rheumatology Outpatients Clinics to determine if it would be possible to identify a cutoff titre above which all patients have ANA related disease or be able to give a statistical guide of likely significance of individual titres if a cutoff titre could not be identified.

**Method**

One hundred and fourteen consecutive unselected patients seen at 2 Rheumatology clinics had their ANA titre measured on Hep2 cell substrate. Primary diagnosis, ANA titre, whether the diagnosis matched the ARA Diagnostic Criteria for a given disease and whether the disease was ANA related were recorded.

**Results**

100 % of patients with titres > 1: 1280 had ANA related disease.
100 % of patients with titres 1: 40 or less had no ANA related disease.
Patients with titres between 1:80 - 1:640 had varying percentages of ANA related disease.

**Discussion**

Although it was not possible to establish a single cutoff titre which would differentially select patients with ANA related disease from those without, it was possible to establish a 'High cutoff' titre which correlated to ANA related disease and a 'Low cutoff' titre where there was no ANA related disease. For those falling between these cutoffs it may be possible to provide probability statistics correlating ANA titre with ANA related disease within the local community. It is hoped this information, along with patients clinical picture will allow the general practitioners to make a more informed decision on whether it is necessary to refer patients to the specialist Rheumatology Clinic.

**Verocytotoxin Producing *Escherichia Coli* in New Zealand**

**Jackie Wright MSc, FNZIMLS**
**ESR, Porirua**

During the last 15 years, verocytotoxin producing *E. coli* (VTEC) have emerged as important foodborne pathogens. Syndromes associated with infection include: haemorrhagic colitis, haemolytic uraemic

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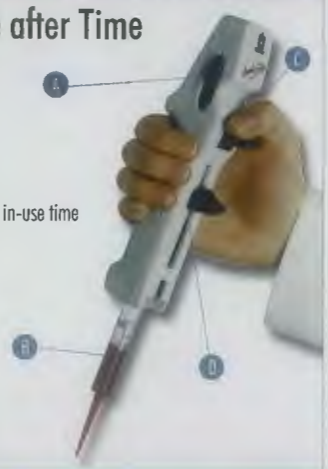

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syndrome (HUS), and thrombotic thrombocytopenic purpura (TTP). The acute mortality rate associated with VTEC HUS is reported to be between three and five percent.

From October 1993 (when VTEC 0157 was first confirmed in New Zealand) to the end of May 1997, a total of 23 New Zealand VTEC cases were confirmed. Most cases presented with bloody diarrhoea. Eight cases developed HUS and one, TTP. The TTP case died. This case was infected not with 0157, but another VTEC serotype. This highlights the need to look not just for OI57, but also for verocytotoxin.

VT can be detected by a variety of methods including: cell culture, enzyme immunoassay (EIA), reverse passive latex agglutination, gene probe testing and polymerase chain reaction (PCR). Serum scrology tests for anti-VT antibodies have to date not been successfully developed.

Kits for the detection of VT are commercially available. These kits detect actual toxin, not the genetic ability to produce toxin. Thus if VTEC infection is suspected, and a commercial VT test is negative, cultures should also be tested by a genetic method. Two VTEC O157 isolates confirmed in New Zealand in the last year were VT negative by EIA and cell culture testing, but positive by PCR.

ESR monitors VTEC in New Zealand under its contract to the Ministry of Health and requests that all VTEC isolates be referred to ESR for further testing.

**Detection of Small Round Structured Viruses and Their Occurrence in Outbreaks of Gastroenteritis in New Zealand**
**Gail E Meekin, Andrea Low**
**Molecular Virology Laboratory**
**ESR Communicable Disease Centre, Porirua**

Outbreaks of gastroenteritis are a major public health problem. Until recently, the causal agent of many outbreaks was attributed to unidentified, unculturable 'viruses'. The development of molecular detection methods has now demonstrated that Norwalk Virus and other Small Round Structured Viruses (SRSVs), are the major cause of food and waterborne nonbacterial gastroenteritis.

Referred faecal specimens from New Zealand cases of gastroenteritis were tested by DNA amplification methods, including reverse transcription and polymerase chain reaction (RT-PCR), to determine the presence of SRSVs. Molecular methods were developed to further discriminate these viruses for epidemiological purposes. Differentiation and typing of SRSVs was carried out by DNA dot blot hybridisation with specific probes and by DNA sequencing of selected strains.

Comparison of viral sequences of New Zealand strains of SRSV with internationally recognised SRSVs showed that the major types occurring in New Zealand since August 1995 were similar to those occurring overseas. The predominant New Zealand type is genetically similar to Maryland virus, a US strain. Sporadic New Zealand outbreaks have also been attributed to Auckland virus, which was identified as the most likely cause of gastroenteritis following consumption of contaminated oysters in 1994. A large South Island outbreak was attributed to Southampton virus. We have identified another distinct New Zealand strain, 'Napier virus'.

Molecular typing methods are now established for differentiation of SRSVs implicated in outbreaks of gastroenteritis. Application of these methods will provide information on disease transmission for epidemiological investigations of public health significance.

**Intestinal Parasitology: What Should We Be Looking For, What Should We Be Reporting?**
**Graeme Paltridge**
**Canterbury Health Laboratories**

This is a discussion paper which raises issues that have arisen over the past few years in the field of clinical parasitology and offers some suggestions for improving the service.

Historically, faecal parasite examinations have consisted of either a direct wet preparation or a concentrate. From about 1980, the stained film became de rigueur in some laboratories. A negative result from a stained fihn and concentrate excluded most of the helminth eggs and larvae that could reasonably be expected, as well as the 'significant' protozoa; *Giardia, E. histolytica* and *D. fragilis.*

Much however has changed over the past 5-I0 years. For example, what we previously called *E. histolytica* in many cases is probably *E. dispar* - a non-pathogenic look-alike. *Cyclospora* and *Isospora* are organisms that we should be aware of and *Microsporidia* is a significant cause of disease in AIDS sufferers. The question arises, "what should be looked for routinely and what selectively?" Various new preservatives and stains as well as antigen detection kits targeting *Giardia, Cryptosporidium* and *E. histolytica* are actively marketed. These have in many cases left the clinician rather confused as to what will be excluded when the parasite box on the requisition form is ticked. The laboratory technologist too may be perplexed as to what is the best testing process to follow. It therefore becomes important that we find the most practical way to examine samples in order to exclude the greatest number of organisms within cost and time constraints.

**How Organisms Are Classified and Why Their Names Are Changed**
**Patricia Short**
**ESR: Communicable Disease Centre, Porirua**

The eminent microbiologist Sydney M Finegold wrote "The primary purpose of nomenclature of micro-organisms is to permit us to know as exactly as possible what another clinician, microbiologist, epidemiologist, or author is refering to when describing an organism responsible for infection of an individual or outbreak".

Bacteria used to be classified and named by their observable characteristics such as colony morphology, gram stain appearance and biochemical reactions. With the advent of sophisticated analytical methods such as DNA hybridisation and cell wall analysis, the taxonomists have been able to re-assess relatedness and to split larger groups of bacteria into smaller, more cohesive and delineated groups which have had to be given new genus and species names. Nowadays newly discovered organisms are only classified and named after exhaustive analytical study.

Descriptions of new genera and species, and reclassifications of previously named organisms are published in several joumals, notably the International Journal of Systematic Bacteriology. It is important that laboratory workers keep informed about any changes that impact on their work, and lenient them in a consistent and practical way.

This presentation will outline how organisms are classified, named or re-named, and how to find out about any changes which are relevant to medical laboratory science.

**The E Test – Experience of a Large Tertiary Hospital**
**Keith Shore, MNZIMLS**
**Laboratory Services Auckland Healthcare**

The E test (AB Biodisk, Solna, Sweden) is a relatively new technique for determining anticrobial susceptibility. The test combines the ease of use of diffusion methods with the quantitative result available from dilution tests. E tests have been shown to be reliable for testing a wide range of non-fastidious and fastidious organisms.

## Giving an Effective Presentation

**Jill Forgie**
**Tutor**
**Christchurch College of Education**

Making an oral presentation effective is a craft which can be learned, practised and refined, like any other.

Few speakers are pure 'naturals'. They know the rules and treat their craft seriously. Even the best, most exciting information will be poorly received if poorly presented.

One of the key ingredients of good delivery is in what the audience perceive as the confidence of the speaker. What does your body language reveal about you? Do you let your audience know that you are authoritative and what you say can be relied on? How do you stand in front of an audience? Are you a pocket juggler or do you prefer to fig leaf position? Are you a pacer, or perhaps you execute the foot-wrap dance from behind the safety of the lectern? And for goodness sake, where do you look?!

A second thorny issue we will unpick is how to make the best use of your voice. We have all sat through the droners; the speakers whose voices were heaven for insomniacs and hell for anyone wanting the information. Everyone can use their voice effectively by building-in variety and applying some simple tricks of the trade.

A good presentation, regardless of its length and content, requires structure. We will look at how to grab your audience's attention and prepare them to listen to your message with an effective opening. Follow this with a logical speech body which guides them safely from Point A to Point B, and a sound and recognisable conclusion that leaves them sure of your message and wanting more.

No workshop such as this would be complete without time to examine how to get the best from the audiovisual aids you may choose to employ. No high technology I'm afraid, but strict adherence to the KISS principle, will enable you to really give power to your presentation.

The rules are simple and by the end of this workshop, you will understand them and know how to apply them. It will then be up to you, the skilled presenter, to go forth and conquer (after practice of course).

## Correlation of ANCA Titre with anti Proteinase 3 (anti PR3) ELISA in Serial Samples from Patients with Wegener's Granulomatosis

**Lisa Brennan+, John O'Donnell*+, Deborah Willis+ Immunology Section +, Canterbury Health Laboratories**
**Department of Rheumatology, Immunology and Allergy*, Christchurch Hospital**

Stored serum samples on eighteen patients diagnosed with Wegener's Granulomatosis were tested for both antineutrophil cytoplasmic antibodies (ANCA) titre by indirect immunofluoresence and anti PR3 antibodies by ELISA to determine if there was any correlation between the results of the two assays. Samples on each patient were collected for a period of between one to four years. (mean = two years). Analysis showed that there was no direct correlation between ANCA titres and anti PR3 ELISA units between patients. However, in five patients there was a correlation between the results obtained.

### Conclusion

In some patients with Wegener's Granulomatosis there is a clear correlation between ANCA titre by indirect immunofluoresence and anti PR3 antibodies measured by ELISA however such a correlation cannot necessarily be assumed and must be determined for each patient.

## The Prevalence of Wegener's Granulomatosis in the South of New Zealand

**John O'Donnell*+, Deborah Willis+, Lisa Brennan+, Immunology Section+, Canterbury Health Laboratories**
**Department of Rheumatology, Immunology and Allergy*, Christchurch Hospital**

The 12 month period prevalence (21 April 1996 to 21 April 1997) of Wegener's Granulomatosis was estimated using two separate methods. The prevalence within the catchment area of Christchurch Hospital, Canterbury Health Limited (approximately 400,000 persons) was determined by extracting information from the hospital discharge database. In addition outpatient sufferers were identified by searching the database of the Immunology Laboratory for cANCA positive patients with a diagnosis of WG as listed in their medical record. A total of 35 patients (male 20, female 15) were identified giving a 12 month prevalence of 88 cases per million. The mean age for males was 61 years (range 37-76) and for females 57 years (range 32-80).

As the catchment population for the Canterbury Health Laboratories extends beyond the Christchurch Hospital catchment, a separate analysis of cANCA positive sera, identified during the same period was also used to estimate the prevalence of WG. The Canterbury Health Laboratories in the South Island of New Zealand has a catchment population of approximately I million (28% of the New Zealand population of 3.6 million). 102 sera from separate patients were identified as positive (50 males, 52 females). The mean age for males was 61 years (range 36-76) and for females 57 years (range 32-80) giving the 12 month period prevalence of cANCA positivity as 102 cases per million. This figure is of a similar magnitude to the first estimate.

The 12 month period prevalence (21 April 1996-21 April 1997) for WG in New Zealand is approximately 90 cases per million with a likely equal ratio of males to females. The mean age of sufferers was approximately 60 years (range 32-80).

## Methaemoglobinaemia

**D Murton, S Carnoutsos**
**Canterbury Health Laboratories**

The ferrous iron of haemoglobin is exposed continuously to high concentrations of oxygen and is therefore oxidised slowly to methaemoglobin, a protein unable to carry oxygen. To restore haemoglobin function, methaemoglobin must be reduced to haemoglobin. Under physiological conditions this reaction is accomplished by the red cell enzyme NADH methaemoglobin reductase (MHR). Should methaemoglobin levels increase eg due to the presence of oxidant drugs, Hb M, or a deficiency in MHR – methaemoglobinaemia will result.

Most methaemoglonaemias have no adverse clinical consequences and need not be treated. Under certain conditions such as exposure to large amounts of oxidant or in young infants, rapid treatment is necessary.

Patients presenting with methaemoglobinaemia must be differentiated between congenital MHR deficiency, presence of Hb M, or the acquired form to enable correct treatment.

A case of methaemoglobinaemia presented to Canterbury Health Laboratories involving a cyanosed neonate. The investigation involved spectroanalysis, enzyme quantitation and electrophoresis. This could detemine the cause of the condition and the baby's correct treatment.

1. Wiley - Liss. American Journal of Haematology 1993; 42: 7-12

Our laboratory started using the E-test in 1994. Since then our use of E tests has been steadily increasing and is likely to continue to increase.

Our uses of the E test include confirmation of methicillin resistance in *Staphylococcus aureus;* susceptibility testing of *Streptococcus pneumoniae* to penicillin and *cephalosporins; viridans streptococci* from sterile sites to penicillin. *Neisseria meningitides* to penicillin, obligate anaerobes from selected infections and gram negative bacteria from serious infections requiring long term parenteral therapy.

**An Update on Emerging Antibiotic Resistances**
**Maggie Brett**
**Antibiotic Reference Laboratory**
**ESR Communicable Disease Centre, Porirua**

The recent global increases in antibiotic resistance have highlighted the public health problems posed by resistant organisms. The scenario of a post-antimicrobial era has been raised. However, surveillance data collected suggest that while resistance to some antibiotics is increasing and some novel resistance mechanisms have emerged, overall antibiotics are still effective in New Zealand. Recent problems with emerging resistance have occurred among staphylocci, streptococci, enterococci, gram-negative bacilli and *Mycobacterium tuberculosis.* The mechanisms of resistances, methods of detecting novel antibiotic resistances, and the prevalence of resistances among these groups of bacteria will be reviewed.

**The Examination of Seminal Fluid**
**Dr Diane Ormsby**
**Fertility Associates Wellington**

One in six couples who try to conceive a child are unable to after I year of trying. In approximately 50% of cases, the childlessness is caused by male infertility or subfertility. For this reason a semen analysis is often one of the first tests requested by a GP in the search for the cause of a couple's infertility, and this analysis is frequently carried out by a local medical laboratory. Whether or not the couple is referred by the GP to a specialist clinic such as Fertility Associates, the analysis forms the basis of the 'detective ground-work' on which the plan for investigation of a couple's infertility is formulated.

This presentation examines the different variables measured in a routine semen analysis and some of the methods used. The role of the semen analysis carried out by the medical laboratory in the overall assessment of fertility is examined. Suggestions will also be made on ways in which information about the 'history' of the semen sample might be collected in order to ensure that this initial semen analysis will provide additional valuable information.

**MRSA Now More Frequently Isolated in the Community Than in Our Hospitals**
**Heather Davies, Helen Heffernan and Maggie Brett**
**ESR Communicable Disease Centre, Porirua**

Since 1990, methicillin-resistant *S. aureus* (MRSA) isolations have increased each year. Between 1995 and 1996, the number of people from whom MRSA was isolated leapt from 762 to 1560. Much of the increase has been due to the emergence and predominance of two strains, designated WSPP I and WSPP2 MRSA. These two strains now account for nearly 80% of the MRSA being isolated, and the majority are isolated from community patients.

Overall, the proportion of MRSA being isolated from people in the community is increasing, and, in 1996, the proportion reached 60%. There have been no major outbreaks of MRSA in New Zealand hospitals in recent years, but there have been episodes of cross-infection. The incidence of MRSA is highest in the Auckland area, with rate of 109 per I 00,000 in 1996, compared with a national rate of 46 per 100,000. Rates were also higher than the national rate in the Hutt and Wellington Health Districts.

The proportion of MRSA that are multiresistant is decreasing. In 1996, only 7.1 % of all MRSA, and 1.4% of WSPP 1 & 2 MRSA, were multiresistant. Therefore, while methicillin-resistance is becoming more prevalent among *S. aureus,* treatment options are not usually seriously limited by multiresistance.

The increasing incidence of MRSA suggests that a reassessment of the current surveillance and guidelines for the control of MRSA is warranted.

**Mycosis Fungoides is Not a Fungal Infection**
**Kirsten J Stack**
**Southern Community Laboratories**
**Christchurch**

The following presentation is a case study of Mycosis Fungoides on a patient that presented to her doctor with itchy generallsed lesions of one month duration in October 1996. This disease is a Non-Hodgkins cutaneous lymphoma which is rare and difficult to diagnose, the difficulty being due to its overlap in appearances with other non speci ific inflammatory responses, in the early stages of the disease. The disease progresses through three phases, premycotic red patches, infiltrative plaques and tumour nodules. These phases are identifiable both clinically and histologically, but are not conclusive. The laboratory tests that can be carried out in addition to the above, to help confirm a positive diagnosis of this disease are T-cell gene rearrangement studies, surface marker studies and immunohistochemistry. In our patient the T-cell gene rearrangement studies were negative, and the surface marker studies inconclusive. The following immunohistochemical tests were performed. Leucocyte Common Antigen, CD45 (T-cell) and CD20 (B-cell), these showed the infiltrating cells present to be leucocytes of T-cell origin. Material was sent overseas to two specialists who both confirmed a histological diagnosis of Mycosis Fungoides. This disease is difficult to diagnose, and in our case was confirmed by a combination of immunohistochemistry, histological appearances, and by clinical appearances.

**Performance Appraisal**
**John Matthews**
**Senior Tutor**
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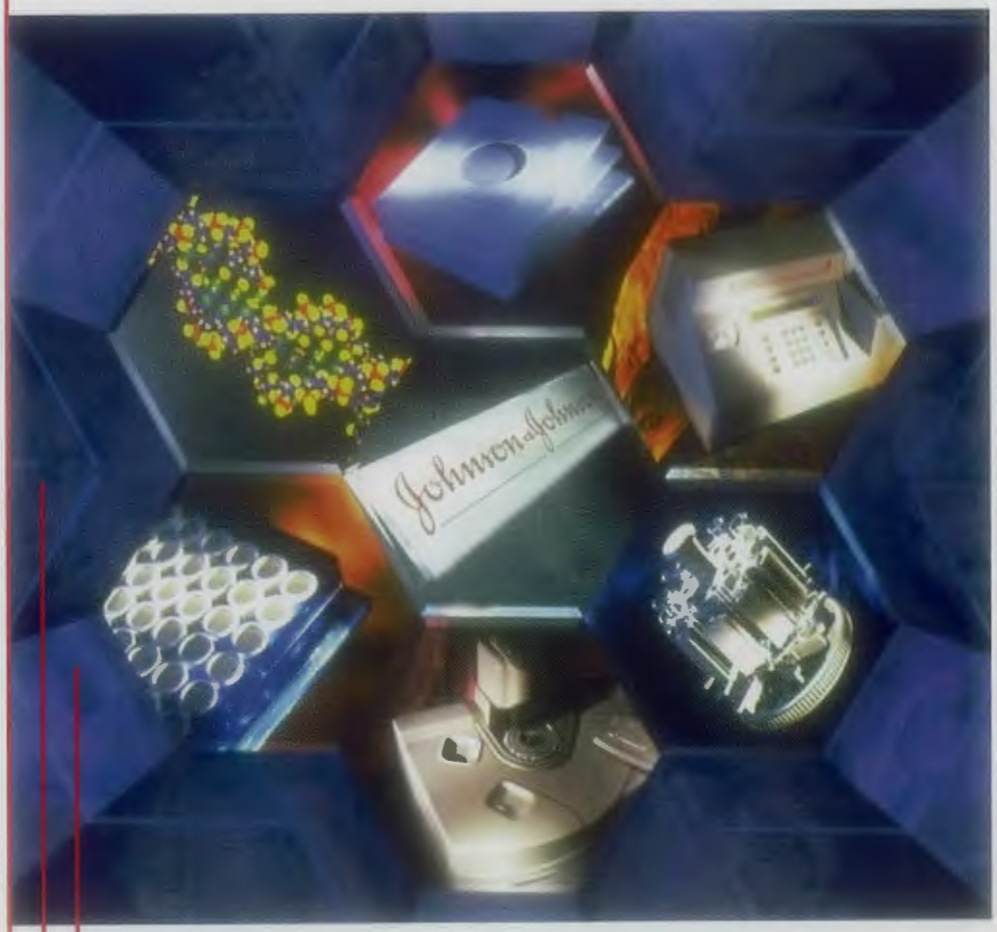

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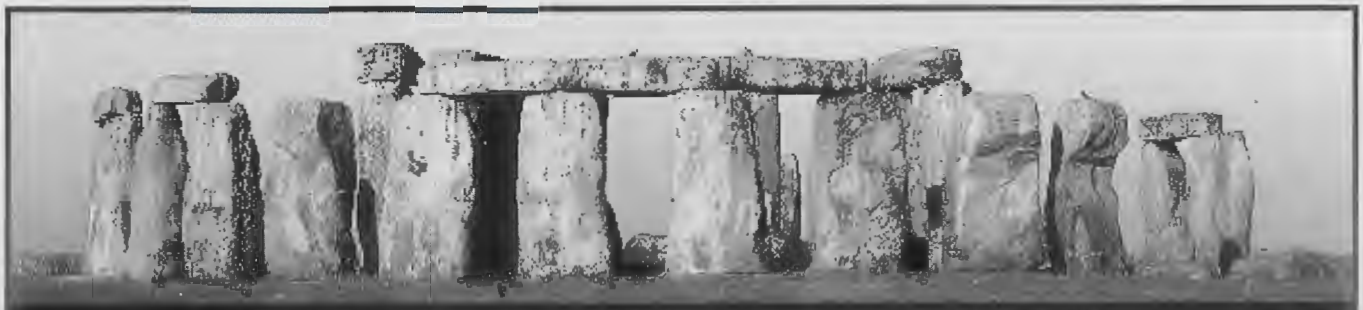

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