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Paediatric liver transplantation in New Zealand: the first 5 years
Justin Wilde, Simon Chin, Peter Johnston, John McCall, Stephen Munn, Chris Nixon, Alison Wesley, Yatin Young, Helen M Evans

Liver transplantation for children has been performed in New Zealand since 2002. It is the treatment of choice for end-stage liver disease and acute liver failure in children. Excellent outcomes that compare well with large overseas centres have been achieved to date. Sixty percent of paediatric liver transplants were performed using live donor (part of the parent’s liver) or split liver grafts (a liver divided between 2 patients)—so offering children liver transplants has not resulted in adult patients waiting longer. By doing liver transplants in New Zealand, families no longer have to relocate to Australia for long periods.

Unplanned overnight hospital admission after strabismus surgery
Mark Elder, David Steven, Spencer Beasley, David Wium

Modern squint surgery for children is typically planned as a day case procedure. About 6% have an unplanned overnight stay and this compares with a similar group of children having a hernia repair where the incidence is 1.1%. The main reason for unplanned stays was postoperative nausea and vomiting and this is far more common after eye operations than hernia repairs. Longer eye operations or more extensive operations make vomiting more likely.

Five-year experience of corneal scrapes at Wellington Eye Department, New Zealand
Kunaal Rajpal, Reece Hall, Helen Long, Anthony Wells

Bacterial keratitis is a potentially sight-threatening eye infection as experienced recently by boxer Anthony Mundine. It is caused by a wide range of different bacteria so constant surveillance and testing in the laboratory is necessary to identify antibiotics that work best on them. Our study concentrated on the different types and numbers of bacteria present on corneal scrapes (a small amount of tissue taken from the front surface of the eyeball for testing) taken from keratitis patients. In keratitis, bacterial resistance to antibiotics is increasing which is concerning. A more accurate database for recording corneal scrape details (than is currently available in Wellington) and a protocol for antibiotic sensitivities and resistance will greatly assist however.
The Auckland City Hospital Device Point Prevalence Survey 2005: utilisation and infectious complications of intravascular and urinary devices

Stephen Ritchie, Deborah Jowitt, Sally Roberts, on behalf of the Auckland District Health Board Infection Control Service

Invasive devices (intravenous and urinary catheters) are an important aspect of modern healthcare delivery, but contribute to infections acquired in hospitals. We reviewed every patient in Auckland City Hospital on a single day to determine the prevalence of device usage and device-related infection. Intravenous (IV) devices were present in 376 (45%) of 830 patients; and 25 (3%) of 830 patients had either confirmed infection or showed signs of infection. Overall, the usage of devices has not increased when compared to similar studies in the late 1990s. We found that a number of devices were not required and should have been removed—an important step in reducing device-related infections.

An outbreak of infectious syphilis in Wellington, New Zealand

Ruth Cunningham, Jane MacDonald, Margot McLean, Caroline Shaw

This study found that there is an outbreak of infectious syphilis in the greater Wellington region. This is in keeping with data from Auckland where clinicians are finding the same thing. This is worrying because infectious syphilis used to be very rare in this country. If not treated it can have severe complications, it can severely affect pregnancies, and it can increase the risk of HIV transmission dramatically. We want to alert doctors because this infection is easy to miss and can mimic other diseases. We urge the Ministry of Health to improve syphilis surveillance and make sexual health a health priority for this government.
Obesity in New Zealand children: a weighty issue

Rachael W Taylor

At present, childhood obesity is undoubtedly a hot topic in both the medical and lay media. Recent announcements of government initiatives, including the food and beverage classification system and new national administration guidelines for food and nutrition in schools, have caused a flurry of interest and analysis, much of it negative. However, obesity is an issue for New Zealand children; with 1 in 10 youngsters aged 5 to 14 years considered to be obese, and a further 20% classified as overweight. The latter statistic may be regarded as even more alarming, because if suitable intervention does not occur then these children are likely to progress to an obese state at some time in the future.

A viewpoint article1 by Grant and Bassin in this issue of the Journal suggests that action needs to go beyond school-based approaches and that more than just simple rhetoric is required if we are to truly address this multinational issue in our small corner of the world.

While resolution of some important controversies is important, we must make sure that such controversies do not impede progress. In childhood obesity, one of the main areas of controversy centres around the use of body mass index (BMI) as an index of body composition in children.

As highlighted in the featured article,1 some are concerned that BMI is essentially too crude a measure for the diagnosis of such an important condition, particularly in relation to ethnicity, sex differences, and more active children. It is unfortunate that such misperceptions surrounding BMI are so widely held. It is true that a particular BMI value cannot give a precise measure of body fat in an individual, but neither will bioimpedance which is often promoted as a superior technique.2

Cut-off values for BMI describe levels at which health risks become more apparent. Obviously, not every person with a high BMI will develop diabetes, dyslipidaemia, or high blood pressure, but their risks are far greater than those with lower levels of BMI. Studies in our laboratory3 and internationally4 clearly show that BMI cut-offs commonly in use5,6 correctly discriminate between children (3–18 years of age) with low and high levels of body fat as measured by dual-energy X-ray absorptiometry (the ‘gold standard’ for measuring body composition) more than 90% of the time. Moreover, BMI cut-offs perform just as well in both sexes and in children4 and adults7 from different ethnic groups. And yes, the odd very athletic child might be misclassified as being overweight when they are not overfat. However, those who criticise the use of BMI on these grounds appear to overlook the fact that such children (and adults) are few and far between in the population and they are generally easy to identify. Furthermore, although it has been suggested clinically that use of a skinfold thickness in addition to BMI will discriminate such children,8 in practice, BMI already performs so well that such additions are unnecessary.4
Grant and Bassin\(^1\) are correct in stating that more action is urgently required and that schools are not the only place where intervention is appropriate. However, it is clear that intervening in the school environment can result in positive outcomes. Our own community-based obesity prevention initiative, the \textit{APPLE project}, showed that a relatively simple intervention (addition of physical activity coordinators in schools and basic nutrition education) can significantly reduce the rate of excessive weight gain in primary-school-aged children. More importantly perhaps, such interventions can produce success even over a very short time period (2 years) if intensive enough.\(^9,10\)

What they may be unable to do, however, is reduce weight in those children who are overweight before the intervention is initiated. Such children may require more intensive intervention than is typically offered in community-based prevention efforts.\(^9,10\) Thus although school-based initiatives may indeed only represent one avenue for intervention, they may well offer an important contribution to the overall attempts to “stem the tide” of the obesity epidemic.

There is no doubt that the outcomes of other school and community-based obesity prevention initiatives currently underway in New Zealand (e.g. \textit{Project Energize} and \textit{OPIC}) will be of immense national and international interest. Obesity is a complex, multifactorial disease\(^11\) with much international research attempting to disentangle genetic, environmental, and societal causes. One might argue that scientific endeavour in New Zealand should concentrate not on identifying the causes, but rather on investigating the efficacy of potential interventions. A spectrum of possibilities could be trialled, ranging from legislative measures to the introduction of programmes at national, local, and individual levels.

Some interventions may offer benefits other than obesity prevention and it is always necessary to ensure that any attempted measures are not associated with harm. Regardless of the debate, what is becoming increasingly obvious is that both a top-down and a bottom-up approach is required if we are ever to “turn the tide” of increasing overweight and obesity. It is clear that the New Zealand Government is willing to try various initiatives, mostly under the umbrella of \textit{Healthy Eating}, \textit{Healthy Action} (HEHA) and \textit{Mission-On}. Such initiatives are attracting a considerable amount of government money. In addition, research funding is available from the Health Research Council and other funding bodies.

What is considerably less clear is how well this money is being spent, whether programmes are being properly developed including community involvement in design, and perhaps most importantly whether every approach is being effectively evaluated. There is no point spending a single dollar on obesity prevention unless each and every initiative is properly evaluated. We are better to do a few things well than to encourage a flurry of activity without ensuring a full evaluation of the process and outcomes of such initiatives.

Finally, given the multifactorial nature of obesity, it is necessary to remember that a ‘magic bullet’ that will prevent obesity in individuals is unlikely to emerge. If only we could identify a ‘smoking gun’, then the prevention of obesity might be tackled with
the similar multifaceted, cohesive, and far-reaching public health campaigns that have been employed for smoking cessation. We should be so lucky!

Competing interests: None.

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Strong forces at work on our senior doctors in New Zealand

Ian Powell

Senior doctors (and dentists) employed by district health boards (DHBs) and who are among the around 92% who are members of the Association of Salaried Medical Specialists (ASMS) have their minimum terms and conditions of employment provided in their national multi-employer collective agreement (MECA).

Prior to 1992, senior doctors had historically been covered by national agreements but this was prevented by a combination of the now repealed Employment Contracts Act and the opposition of the National Party Government at that time. During 2003–04 the first MECA under the Employment Relations Act was negotiated, a complex task involving merging 21 separate collective agreements into one.

The first MECA expired on 30 June 2006 (it continues in force until a replacement is negotiated) and negotiations for the second commenced in late May 2006. Virtually since the commencement of negotiations the parties (ASMS and DHBs) have been at an impasse. Prior to the unprecedented national stopwork meetings held between 17 July and 9 August, there had been 24 days of negotiation including 10 with an external mediator.

Recruitment and retention focus

The focus of the ASMS has been on recruitment and retention mindful of New Zealand’s historical vulnerability as a geographically isolated small country with a limited critical mass to sustain its medical workforce.

Our inability to retain the younger doctors that we train so well is increasing along with our dependence on recruiting in the highly competitive international medical labour market (of all OECD countries we have the highest proportion of overseas doctors). DHBs are also losing specialists, both in full and in time commitment, to the private sector.

The more expensive alternative to enhancing the MECA is the use of external locums whose costs are currently running (both resident and senior doctors) at over NZ$100 million. These have more than doubled over the past 6 years.

Specifically, while looking over our shoulders at recent Australian settlements which significantly enhance terms and conditions in response to their own serious shortages, the ASMS focussed on retention in the first instance (the better our retention the stronger our ability to recruit) but to also structure the MECA in such a way as to be more internationally attractive.

The gap between Australia and New Zealand is simply too great (after 7 years a specialist in the Australian state of New South Wales will earn at least A$50,000 more than a specialist in New Zealand) to achieve parity. In fact, many packages in Australia are between 50% and 100% greater than those in New Zealand.
Achieving parity with Australia is simply too much in our small country. Instead the ASMS has endeavoured to be smarter through means such as increasing the length of the salary scale higher to around the same level as in Australia (even if it still takes longer to get there); doubling the size of CME expense reimbursement to NZ$16,000 (even though still well short of the nearly A$28,000 in New South Wales); and increasing the rate for working on after-hours call and shifts to double-time recognising that this work is more pressurised than in Australia because of the latter’s natural critical mass advantage. We are also seeking an appropriate salary increase not less than the rate of inflation in order to give a retention message that DHBs value senior doctors.

Improving the MECA to partially offset the large advantage Australia has in competing against us for overseas-trained doctors and recruiting specialists in New Zealand is only part of what is required to address our vulnerability. Other measures, in particular by enhancing job satisfaction and clinician leadership, are also required but an enhanced MECA is an important part of the mix.

The DHBs have responded negatively to this challenge by seeking to constrain expenditure to the Government’s future funding track (estimated inflation over the next 3 years minus 0.5% in each year) which precludes the achievement of the ASMS’s objective of a more competitive and attractive MECA for recruitment and retention.

In addition, in what can only be described as a strategic blunder, they have sought to disempower and de-professionalise senior doctors, as well as increase managerial power, through counter-claims that seek to undermine time for non-clinical duties, sabbatical and consultation rights.

**Australian threat**

The ASMS was caught somewhat off-guard by the immediate extent of the Australian threat. But extensive anecdotal reports of westwards Tasman migration suggested that the situation was much worse that when our negotiations commenced in May 2006.

In July 2007 we conducted an electronic membership survey asking for the names of specialists who had resigned to take up positions in Australia since January 2006. This survey technique would inevitably understate the true picture but it nevertheless revealed a major threat to the viability of many specialist services in New Zealand with 80 specialists identified or around one a week.

Whether one looks at it as being nearly equivalent to the entire senior medical workforce of a medium size DHB, or the capacity to devastate specific services such as has already occurred with paediatric oncology in Wellington, the implications suggest a crisis.

**Stopwork meetings**

In response to the (by now over 13-month) long impasse in negotiations, the ASMS took the unprecedented step of convening national stopworks. The DHBs’ advocate embarked on a campaign to undermine them by a variety of means. He misused
Medical Council data. He claimed that the number of specialists employed had increased by nearly 300 between 2000 and 2005. However, he neglected to mention that this increase occurred up until 2004 with a new development in 2005, a slight decline. Further, the increase was embellished by the addition of Council approved vocational registration for five new branches of medicine (general registrants became specialists in effect by a stroke of a pen).

Other means included exaggerating the cost of the ASMS claims (by including existing operational costs), exaggerating the financial benefits of their position by a similar technique, and fabricating the average earnings of specialists in an attempt to embarrass them.

However, these efforts failed with the meetings attracting overwhelming attendances. The smallest was 8 in Westport (100% turnout) and the largest was around 260 in Auckland DHB; around 1740 doctors in total.

Of this number, a mere 4 voted to accept the DHBs’ proposal for settlement. Further, less than 50 voted against a recommendation that a national ballot be conducted on limited industrial action (excluding acutes and emergencies) should the impasse continue. There is a growing appreciation that the risks of inconveniencing patients during strikes is less than the longer term inconvenience and risk of harm of a medical workforce crisis.

If a further escalation in this bitter industrial dispute is to be prevented then the DHBs will need to come out of their corner and move from their own arbitrary parameters which are contrary to the objective of recruiting and retaining a sustainable quality senior medical workforce in New Zealand’s publicly provided health system.

**Competing interests:** None.

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Paediatric liver transplantation in New Zealand: the first 5 years

Justin Wilde, Simon Chin, Peter Johnston, John McCall, Stephen Munn, Chris Nixon, Alison Wesley, Yatin Young, Helen M Evans

Abstract

Aim To report the first 5 years of paediatric liver transplantation (LTx) undertaken by the New Zealand Liver Transplant Unit.

Methods The records of all patients aged 0 to 15 years assessed for LTx between 1 January 2002 and 1 November 2006 were examined. Demographics, criteria for listing, waiting time, transplant-hospitalisation details, and outcome to date are reported.

Results Thirty-eight children were assessed for LTx, of whom 33 were listed. One improved and was de-listed, 3 died on the waiting-list, and 1 remains on the list currently. Twenty-eight children have undergone 29 transplants; there were 25 primary and 4 re-transplants (3 had their primary transplant in Australia). The median wait-time was 122 days and median age at transplantation was 2 years 6 months. Fourteen (50%) were European, 10 (36%) Māori, 3 (11%) Pacific (mostly of Samoan, Tongan, Niuean, or Cook Islands origin), and 1 (3%) Asian. The most common diagnosis was extra-hepatic biliary atresia (59%) followed by alpha-1 antitrypsin deficiency and acute liver failure (14% each). There were 6 whole liver grafts and 23 partial liver grafts including 7 live donor and 10 split LTx. Median time in the Paediatric Intensive Care Unit (PICU) was 2 days and median hospital stay after LTx was 25 days. Time spent in Auckland immediately pre- and post-transplant for families from outside the region was a median of 14 weeks.

Postoperative morbidity includes biliary leaks or strictures in 10 (36%), vascular thromboses in 7 (24%), and culture positive bacterial infection in 14 (50%). Twelve (43%) experienced one or more episodes of acute rejection, 3 developed chronic rejection, and post-transplant lymphoproliferative disorder (PTLD) occurred in 2 patients. Despite these problems, graft survival is 97% and patient survival is currently 100%. All patients of school age are currently attending school.

Conclusion Liver transplantation is now established in New Zealand as the treatment of choice for end-stage liver disease and acute liver failure in the paediatric population. Excellent outcomes that compare well with large overseas centres have been achieved.

Liver transplantation provides life-saving treatment for end-stage liver disease (ESLD) and acute liver failure (ALF) in the paediatric population. The aetiologies of ESLD in children are different to adults, with the majority being conditions which do not recur in the transplanted liver.

Extra hepatic biliary atresia (EHBA) is responsible for 50–60% of cases, followed by intrahepatic cholestasis secondary to alpha-1 antitrypsin deficiency and other rare
diseases of bilirubin metabolism and excretion. ALF is responsible for up to 20% of LTx and can be due to infectious, metabolic, vascular, and toxic causes.

Children constitute about 10% of patients requiring LTx\(^1\) and share the same limited pool of donor organs with adult patients. There is an international shortage of donor organs, with New Zealand and Australia having a donation rate that is comparatively low.\(^2\) Innovative surgical techniques have been developed to overcome the problems associated with the donor shortage and the difficulties of finding size-matched grafts for paediatric patients. These techniques include split liver transplantation and live donor liver transplantation.

In split liver transplantation, a deceased donor organ is surgically divided (either in situ or ex situ) to provide two allografts. In live donor liver transplantation, a portion of a healthy donor liver is removed for transplantation. These techniques have allowed children to undergo timely LTx with appropriately sized organs and enable children to receive transplants without impacting negatively on the adult waiting list.\(^3\)

For patients with acute liver failure, the New Zealand Liver Transplant unit (NZLTU) has a sharing arrangement with Australia which gives priority to urgently listed patients, including paediatric recipients.

Figure 1. Paediatric grafts most commonly utilise segments II-III of the adult donor liver

Since paediatric liver transplantation was first introduced, long-term graft and patient survival rates have improved incrementally. Whilst improved surgical technique and perioperative care have contributed, the major factor has been more potent and effective immunosuppression, particularly the introduction of the calcineurin inhibitors (cyclosporin and tacrolimus) in the 1980s.\(^5\)
Calcineurin inhibitors now form the mainstay of immunosuppressive therapy, along with steroids which are given in the first 6–12 months. Another factor that has contributed to better long-term outcome is more effective monitoring, prophylaxis, and treatment of infectious diseases. In the current era, 5-year graft and patient survival rates for children are approximately 80 to 90%.1,6

Background to paediatric liver transplantation in New Zealand

The first New Zealander was transplanted in 1986 in the United Kingdom7 and the first New Zealand child received a transplant in 1988. Prior to 2002, most New Zealand children needing a liver transplant were referred to the Queensland Liver Transplant Service in Brisbane, Australia.8

In 1993, the Ministry of Health requested that the New Zealand Society of Gastroenterology provide national guidelines for liver transplantation9 and in 1996 a request for proposals from New Zealand and Australian hospitals was issued. The NZLTU, based at Auckland Hospital, was awarded the contract for New Zealand patients 7 years and older, and the first paediatric transplant was performed on a 14-year-old in 2000 (this case was included in previous report on the first 4 years of the NZLTU7 and is not included here).

The contract for younger paediatric patients was awarded to the NZLTU in 2001, based at Starship Children’s Hospital, Auckland. The first transplant under the paediatric contract was performed in February 2002.

Initial contract discussions were held with the Health Funding Authority in late 2000 and early 2001 which led to a suitable contract price and volumes of 6–7 per annum. The reimbursement for liver transplantation included the transplant assessment, travel, and accommodation for the patient and one caregiver, the transplant itself, and 90 days of postoperative care. The funding level has been sufficient to cover the costs associated with the delivery of the service and has been maintained by the Ministry of Health as a national services budget item with suitable inflation-related adjustments. The contract price was NZ$180,000 in 2001 and is now NZ$224,745.

Methods

Paediatric Liver Transplant Protocol—A multidisciplinary team provided care according to a detailed written protocol. Children referred for consideration of LTx underwent comprehensive medical and psychosocial assessment. After listing, patients waited at home for a liver to become available, if they were medically stable and able to reach Auckland by road or air within several hours of being contacted. Pre-transplant inpatient care was provided, whenever necessary, in a specialised ward or the Paediatric Intensive Care Unit (PICU).

Patients who received partial grafts underwent orthotopic liver replacement with caval preservation and a ‘piggyback’ procedure. Four of six patients receiving whole grafts had caval interposition. Direct portal vein anastomosis was used except in one patient with portal vein thrombosis who required an interposition graft from the superior mesenteric vein. Direct hepatic artery reconstruction, using magnification, was used—except in two patients undergoing re-transplantation who required interposition grafts from the infrarenal aorta.

Biliary reconstruction was with Roux-en-Y hepatico-jejunostomy—except in older children receiving whole liver grafts when a duct-to-duct anastomosis was used. Doppler ultrasound examination was undertaken at the conclusion of surgery and daily for the first week. Heparin was given for 5–7 days as prophylaxis against vascular thrombosis.

Potential live liver donors were assessed according to a strict protocol that included independent medical, psychosocial, surgical, radiological, and anaesthetic assessment. Splitting of deceased donor
livers was considered whenever an ‘optimal’ donor organ was offered and splitting was logistically feasible. All live donor hepatectomies and deceased donor split procedures were performed by one surgeon (JM).

Following LTx, all patients were managed in PICU for ventilatory and inotropic support before transfer to the ward. Auckland-based children were discharged home when stable and those from outside Auckland were discharged to Ronald McDonald House, usually for a period of up to 3 months. Perioperative antimicrobial prophylaxis consisted of amoxicillin and cefuroxime for 24 hours, oral nystatin for 2 weeks, and oral cotrimoxazole for 12 months. Cytomegalovirus (CMV) prophylaxis with 12 weeks of oral valganciclovir was given to donor positive-recipient negative patients. All patients were monitored for EBV and CMV by monthly quantitative PCR. Increased EBV load was managed with a reduction in immunosuppression. After 12 months, EBV monitoring was done according to clinical indication. Increased CMV loads were treated with ganciclovir.

Primary immunosuppression comprised tacrolimus and corticosteroids. Steroids were weaned with the aim of discontinuing at 1-year post transplant. Clinical or biochemical suspicion of acute allograft rejection was confirmed on liver biopsy. Episodes of acute rejection were treated with high-dose intravenous methylprednisolone for 3 days. All children undergo routine liver biopsy at 1-year post-LTx, prior to discontinuation of steroids. Renal function at 1-year post-transplant was assessed using EDTA clearance. Those with EDTA clearance of <60 mL/min/1.73m² were converted from a calcineurin inhibitor to either sirolimus or mycophenolate mofetil.

Results

Demographics—From January 2002 a total of 38 children were assessed for LTx at NZLTU. Thirty-three were accepted and placed on the waiting-list—1 improved and was de-listed, 3 died while waiting (sepsis in 2 and uncontrolled variceal bleeding in 1), and 1 remains on the list currently. See Figure 2.

A total of 29 paediatric LTx have been performed on 28 patients; 25 were primary transplants and 4 were re-transplants (3 had their original transplant in Australia and 1 in New Zealand). The number of patients assessed and the number transplanted during each year of the programme is shown in Figure 3.

Figure 2. Outcomes for 38 children assessed by New Zealand Liver Transplant Unit (NZLTU)

ESLD=End-stage liver disease; ALF=Acute liver failure; OLT=Orthoptic liver transplant.
The median waiting time from listing to transplantation was 122 days (range 1 to 699). The median age at transplantation was 2 years 6 months, with a range from 6 months to 14 years of age; 15 patients were male and 13 female; 14 (50%) were European, 10 (36%) Māori, 3 (11%) Pacific (mostly of Samoan, Tongan, Niuean, or Cook Islands origin), and 1 (3%) Asian. Twelve patients were from Auckland, 11 from other locations in the North Island, 3 from the South Island, 1 from Rarotonga (Cook Islands), and 1 from Samoa (now resident in Auckland).

**Figure 3. Number of paediatric assessments and transplants per year**

![Graph showing number of assessments and transplants per year](image)

**Diagnosis**—EHBA was the primary diagnosis in 17 (59%) of the children—including 6 of 14 (43%) European children compared to 8 of 10 (80%) Māori children. The other 2 Māori children received re-transplantation for chronic rejection of livers previously transplanted in Australia for EHBA.

Thus all Māori children transplanted had EHBA as their original primary diagnosis. The second most common primary diagnoses were alpha-1 antitrypsin deficiency, and acute liver failure, each present in 4 (14%) cases (Table 1). One child with EHBA had an incidentally-found hepatocellular carcinoma in the explanted liver.
Table 1 Primary liver disease in 38 patients assessed and 29 patients transplanted

<table>
<thead>
<tr>
<th>Primary liver disease</th>
<th>Assessed</th>
<th>Transplanted</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-stage liver disease</td>
<td>Total=31</td>
<td>Total=25</td>
</tr>
<tr>
<td>Extra hepatic biliary atresia</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>Alpha-1 antitrypsin deficiency</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Progressive familial intrahepatic cholestasis</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Cryptogenic cirrhosis</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Chronic allograft failure</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Acute hepatic failure</td>
<td>Total=7</td>
<td>Total=4</td>
</tr>
<tr>
<td>Non-A non-B hepatitis</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>HSV neonatal hepatitis</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Wilson’s disease</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Aminata phalloides poisoning</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Acute allograft failure</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Total=1</td>
<td>Total=0</td>
</tr>
<tr>
<td>Protein C deficiency</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

The median PELD (paediatric end-stage liver disease) score at listing for children under the age of 12 was 14 with a range from -7 to +32. PELD is used in some centres to prioritise children on the waiting-list. It is calculated using bilirubin, markers of synthetic dysfunction (albumin and INR), with additional weighting to those children aged under 1 year and those who are malnourished (<2 standard deviations below the mean for height and/or weight).10

Of note, the children with acute liver failure had a higher median PELD score of 26 (range 12 to 31). However, those who died on the waiting-list did not have a higher score than the rest of the children (median PELD = 11; range -7 to 17). The one child who improved and was de-listed had a score of 15. Two children over the age of 12 had MELD (model for end-stage liver disease) scores of 8 and 11. This is a similar scoring system for adults and children over 12 and is calculated using bilirubin, INR, and creatinine. PELD and MELD scores are not comparable.

Operative and postoperative course—There were 5 whole liver grafts and 24 partial liver grafts. Of the partial liver grafts, 7 were from live donors and 10 were split liver grafts. The remaining 6 were reduced size grafts. Average ischaemic time was 7 hours 40 minutes, and average operating time was 6.5 hours. Median stay in PICU was 2 days (range 1 to 28) and total hospital stay after LTx was 25 (range 11 to 109) days.

Readmission data are only available for Starship Hospital. Eleven patients (39%) required readmission between 1 and 20 times. The total number of readmission days in these 11 patients was a median of 7 (range 0 to 158).

The 15 patients who were not from Auckland resided in Ronald McDonald House. The median number of nights spent pre- and post-LTx (includes transplant assessment, time spent waiting in Auckland, and post-transplant convalescence) was 138 days (range 5 to 558), or 20 weeks.

Complications—One live donor developed a wound infection. There were no other donor complications and all were discharged from hospital within 1 week of surgery. Surgical complications were mainly vascular and biliary, and 80% of these occurred in the first 15 transplants.
Vascular complications occurred in 7 (24%) children. There were 3 (10%) hepatic artery thromboses; 2 occurred early post-transplant and were successfully managed by re-operation, 1 occurred late with no adverse effect on the graft.

Two patients had early portal vein thrombosis, both were successfully managed by re-operation, and two had hepatic venous outflow obstruction successfully managed by placement of endovascular stents. One graft was lost on day 1 post-LTx due to venous thrombosis. This patient was urgently re-listed and underwent a successful re-transplant 2 days later.

Biliary complications occurred in 10 (36%) children; bile leaks in 4, and strictures in 8 (2 with bile leaks went on to develop strictures). Leaks were managed by percutaneous drainage and/or re-operation. Strictures were managed in the first instance by percutaneous transhepatic dilation and stenting, and re-operation if the stricture failed to resolve. Five children had a total of 6 open surgical revisions of the biliary anastomosis. Eight patients had re-laparotomy for other reasons, including 2 for intestinal perforation.

Two intraoperative complications did not involve the liver graft. In the first, as seen on a postoperative chest X-ray, the tubing of a child’s pre-existing implantable venous access device (Port-a-Cath) had dislodged and impacted in the left pulmonary artery. It was unclear how this occurred. The tubing was successfully removed radiologically.

In the second intraoperative complication, a right jugular central line became dislodged during the transplant operation, with extravasation of intravenous calcium into the surrounding tissues. As a consequence, the patient had necrosis of the right sternocleidomastoid and trapezius muscles. The wound was debrided with later application of a skin graft, which will require further revision when the child is older.

The median number of biopsies per patient, including the 12-month protocol biopsy, was 2 (range 0-10). Twelve (43%) patients have had 19 episodes of histologically proven acute cellular rejection and 3 developed histological evidence of chronic rejection. All have responded to adjustments in immunosuppressant regimen and there has been no graft loss due to rejection.

Fourteen children (50%) had one or more episodes of culture positive bacterial infection. In addition two patients had tissue invasive CMV infection and one had Varicella zoster virus infection. There have been no episodes of fungaemia or tissue invasive fungal sepsis.

Two children developed PTLD. The first was a 4-year old-boy, transplanted 3 years earlier for EHBA. He was found to have PTLD during bronchoscopy for recurrent pneumonia. He responded well to rituximab (a monoclonal antibody against CD20 which targets B-lymphocytes) and a reduction in his immunosuppression levels.

The second was a 3-year-old girl transplanted 2 years previously for EHBA. She was known to have a high EBV load, and presented with a 2-week history of rapidly enlarging cervical lymphadenopathy. Histology and cytology confirmed a diagnosis of Burkitt’s lymphoma, the farthest end of the PTLD spectrum. She was treated with a combination of rituximab, changing immunosuppression from tacrolimus to sirolimus, and a course of cyclophosphamide-based chemotherapy. Both children with PTLD have had complete remissions and have maintained normal graft function.
Renal dysfunction occurred in 3 children (11%) with one requiring short-term renal replacement therapy for acute tubular necrosis in the early post-transplant period. One child developed asymptomatic mild cardiac septal hypertrophy not requiring treatment, possibly secondary to immunosuppression.

Patient survival is 100% and graft survival is 97%. All children are living at home and those who are of school age are attending school. Although not formally tested, neurodevelopmental progress and functioning is felt to be age-appropriate in all children.

Discussion

In 2000, a 10-year report was published on the experience of children from Auckland who had received liver transplants. All children were transplanted in Australia, the majority at the Queensland Liver Transplant Service in Brisbane. The families of children transplanted in Queensland needed to reside in Australia for 14–71 weeks with a median of 24 weeks. Good outcomes were achieved although there were high rates of morbidity.

The report concluded that a New Zealand paediatric LTx programme could expect to perform liver transplants on up to six children annually. When it was subsequently proposed that paediatric LTx be undertaken in New Zealand, concern was expressed about the ability of a small volume centre, like NZLTU, to deliver outcomes that would be comparable to those achieved in Australia.

However, after 5 years and 29 transplants in New Zealand, graft and patient survival stands at 97% and 100% respectively. This compares favourably with all overseas benchmarks including Australia, Europe, and North America. These results have not been achieved without morbidity, however, and the complication rates (particularly vascular and biliary) were significant.

In the multicentre North American Studies of Pediatric Liver Transplantation (SPLIT) database, 39.1% of patients had culture-positive bacterial infections, while 15.6% had vascular complications and 14% had biliary tract complications. Our rates of vascular and biliary complications were higher than this for the first 15 cases but have been lower thereafter. This implies a learning curve during the early cases. Vascular and biliary complications must be managed expeditiously and well to avoid graft and patient loss, and in the first 5 years of the paediatric programme only one graft was lost and there was no loss of life. It is also gratifying that no grafts to date have been lost to rejection.

As survival rates have improved and the population of children with transplanted livers has increased, attention has turned to long-term outcomes and the effects of immunosuppression given over many years. Children are often Epstein-Barr virus naive and therefore more prone to PTLD, which is a manifestation of unchecked B-lymphocyte proliferation driven by EBV in the face of impaired T-cell immunity.

The incidence of PTLD in paediatric liver transplantation is 5–10% and treatment is with a combination of reducing immunosuppression, anti-B-lymphocyte antibodies, and conventional chemotherapy. Fortunately both of our cases responded well to these measures.
Although children are not usually prone to recurrence of the original disease in the transplanted liver, histological abnormalities (namely chronic allograft hepatitis and de novo autoimmune hepatitis) have been shown to increase over the first 10 years post-transplantation.\textsuperscript{13}

Poor adherence with immunosuppressive medication is also a potential threat, especially during adolescence. Another major long-term goal is preservation of renal function. In the past, when calcineurin inhibitors were the only reliable immunosuppressive agents available, chronic renal failure occurred in up to 20\% of liver allograft recipients by 10 years post-transplant.\textsuperscript{14} It is anticipated that the availability of renal sparing immunosuppression may provide a good alternative for patients who develop renal impairment on calcineurin inhibitors.\textsuperscript{15}

As expected, and in line with international figures, EHBA and alpha-1 antitrypsin deficiency continue to be the two most common reasons for LTx in the paediatric population.

Māori and Pacific children continue to be over-represented amongst paediatric LTx recipients, primarily felt to be due to a high incidence of EHBA amongst these groups. This is an area that requires clarification with a formal study.

The median time in Auckland for families from outside the region based on admissions to Ronald McDonald House is 20 weeks which compares favourably to the median of 24 weeks which families had to live in Queensland when transplants were performed there. However, this figure includes all visits to Auckland both pre-and post-LTx. The immediate perioperative stay was much shorter, at a median of 14 weeks.

Since LTx have been performed in New Zealand, families are spending a shorter period away from home.

Twenty-five percent of paediatric LTx to date have been performed using live donors, and 35\% using split liver grafts. This has enabled 60\% of children to receive a graft without impacting on the number of deceased donor organs available overall. Despite the expansion of the donor pool that these technical innovations provide, three children (10\%) died while on the waiting list. Furthermore, during the same 5-year period about 15\% of adult patients awaiting transplantation died or were delisted because of deterioration in their condition.

The shortage of donor organs, therefore, continues to be the greatest challenge facing New Zealanders of all ages who require a liver transplant.

**Conclusion**

In summary, despite the small size of the programme and New Zealand’s geographic isolation, paediatric liver transplantation in New Zealand has proven to be both feasible and effective. All 28 children transplanted so far are alive and there was only one graft loss which was treated successfully with re-transplantation. While vascular and biliary complications were more frequent than in larger centres, most occurred in the first 2 years of the program.

Sixty percent of paediatric LTx were performed using live donor or split liver grafts, and we need to continue to pursue these alternatives to mitigate the shortage of deceased donor organs. One major advantage of providing LTx for children in New Zealand is the shorter period away from home for families.
Zealand is to the families who no longer need to re-locate to Australia for long periods.

**Competing interests:** None.

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**Acknowledgement:** We acknowledge the assistance of the NZ Liver Transplant Advisory Group, chaired by Associate Professor Phil Bagshaw.

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**References:**

Unplanned overnight hospital admission after strabismus surgery

Mark Elder, David Steven, Spencer Beasley, David Wium

Abstract

**Purpose** To examine the reasons for unplanned overnight hospital admission in paediatric patients undergoing strabismus repair, to identify preventable causes (particularly postoperative nausea and vomiting), and to compare the rate of unplanned overnight stay with a group undergoing inguinal hernia repair.

**Method** A retrospective review of consecutive patients under age 17 having strabismus surgery over a 5-year period between January 1995 and December 1999 was undertaken at Christchurch Hospital, New Zealand. A control group, from a similar period, of children having elective inguinal hernia repair was used to compare the rate of overnight stay.

**Results** 375 patients had strabismus surgery, of which 51 stayed overnight; 19 of these were from remote locations and stayed for geographic reasons only, 9 stayed overnight preoperatively only, thus leaving an unplanned overnight stay rate of 6.4%. This compared to a rate of 1.1% in those having hernia surgery. The reasons for overnight stay were postoperative nausea and vomiting (50%), anaesthetic complications (18%), late afternoon surgery (14%), social factors (14%), and pain (5%). Significant associations were found between postoperative nausea and vomiting and the extent and duration of surgery. Possible associations not reaching significance included a higher rate of postoperative nausea and vomiting in those receiving nitrous oxide, and those with evidence of stimulation of the oculo-cardiac reflex.

**Conclusions** The provision of suitable accommodation and careful planning of the type and timing of surgery would be expected to reduce the overnight stay rate after strabismus surgery.

Strabismus surgery is often expected to be a day case procedure. Unplanned hospital admission postoperatively is therefore often regarded as a negative outcome. Despite this, a review of the literature revealed only two previous studies on this aspect, in 1975 and 1990. This study investigated the reasons for overnight stay in paediatric patients undergoing strabismus repair to identify preventable causes. Postoperative nausea and vomiting (PONV) were examined more closely. The rate of overnight stay in this group was compared with that of children undergoing routine inguinal hernia repair. This control group had anaesthetic requirements and duration of surgery similar to those of strabismus surgery.

Christchurch Hospital in the South Island of New Zealand is a tertiary referral centre that covers a population of 500,000, some of whom live in geographically isolated areas. All children undergoing strabismus repair were evaluated at a preoperative assessment that involved orthoptic review, a nursing assessment explaining the
admission process and the pre- and postoperative care requirements, a medical review by an intern, and an ophthalmic review by the operating surgeon.

All patients attended the Day Stay Surgical Unit on the day of surgery where they were seen by their anaesthetist. Children under 2 years of age were assigned to lists covered by paediatric anaesthetists. Standard strabismus surgical techniques were used by the six consultant surgeons involved. As Christchurch is a teaching institution, residents participated in many of the cases on both the anaesthetic and ophthalmic sides. Anaesthetic techniques varied over the time of the study, between anaesthetists and according to the needs of each case. Prophylactic antiemetics were given routinely: ondansetron, droperidol, metoclopramide, and cyclizine.

Patients were observed in recovery until deemed stable enough to return to the Day Stay Unit and thereafter discharged home from the Unit when alert, comfortable and tolerating oral fluids. This Unit closed at 1930 hours—patients not sufficiently recovered were admitted to a paediatric surgical ward. Analgesia typically included intraoperative paracetamol suppositories and short- or long-acting opiates and opiate analgesia if required postoperatively. Sub-tenons anaesthesia was given by some surgeons.

Methods

Consecutive patients in the paediatric age group (16 years or less at time of operation) undergoing strabismus repair as a primary procedure over a 5-year period from January 1995 to December 1999 at Christchurch Hospital were identified. These were analysed retrospectively by case note review. Information was gathered on the type of surgery completed, the anaesthetic management and, if an overnight stay occurred, its reason. A ‘significant’ oculo-cardiac reflex response (OCR) was defined as a 20% or greater drop in pulse rate during surgery or the requirement of intraoperative atropine for significant bradycardia. Associations between postoperative nausea and vomiting and possible causative factors were examined with the Chi-squared test with Yates’ correction.

Consecutive paediatric patients having elective inguinal hernia repairs between September 1996 and March 2000 were used as a control group.

Results

A total of 378 patients in the paediatric age group were identified as having had strabismus surgery, however three sets of patient records could not be found, thus leaving 375 for analysis. Fifty-one of these stayed at least one night in hospital, of whom 19 were from remote areas and were planned admissions for geographic reasons only. A further nine stayed the night before surgery and were not relevant to postoperative causes of unplanned overnight admission. One was a planned admission to allow review of an adjustable suture.

Thus out of the remaining group of 346 who were expected to be day cases, 22 had unplanned admissions, thus producing an unplanned overnight stay rate of 6.4% (22/346). The reasons for overnight stay in this group of 22 are summarised in Table 1. Those that stayed due to being done later in the day (14%) were those that were deemed to have been able to be discharged on the same day if their operation was done earlier in the day.
Table 1. Reasons for overnight stay

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>PONV</td>
<td>11</td>
</tr>
<tr>
<td>Anaesthetic complications</td>
<td>4</td>
</tr>
<tr>
<td>Late afternoon surgery</td>
<td>3</td>
</tr>
<tr>
<td>Social</td>
<td>3</td>
</tr>
<tr>
<td>Pain</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>

PONV = post-operative nausea and vomiting

Table 2. Duration of anaesthesia according to operation type

<table>
<thead>
<tr>
<th>Surgery</th>
<th>Average duration</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(minutes)</td>
<td></td>
</tr>
<tr>
<td>One muscle</td>
<td>27.8</td>
<td>20-60</td>
</tr>
<tr>
<td>Two muscles</td>
<td>41.0</td>
<td>20-90</td>
</tr>
<tr>
<td>Three or more</td>
<td>44.0</td>
<td>20-90</td>
</tr>
</tbody>
</table>

Several potential associations with PONV were examined. These included the use of nitrous oxide as an anaesthetic agent, the number of muscles operated on, the stimulation of the oculo-cardiac reflex, and the duration of surgery. No cases of PONV requiring admission occurred in the 68 patients who had single muscle surgery; all 11 cases of PONV occurred in those who had 2 or more muscles operated on (11/307, 3.6%). This difference was significant (p<0.05).
The average duration of anaesthesia according to surgical type is shown in Table 2. Longer operations were associated with PONV, which was the cause of unplanned overnight stay in 3 of 297 patients whose operations took 45 minutes or less (1.0%) and in 8/78 whose surgery took longer than 45 minutes (10.3%, p<0.001).

The anaesthetic complications that required admission were (in one patient each) postoperative tachycardia, laryngospasm, a family history of malignant hyperthermia, and inadequate fluid intake. The social factors that prevented discharge were an unsuitable home situation in two cases and the concurrent admission of a sibling for a medical condition in one case.

Trends that did not reach significance were PONV and nitrous use, and PONV and the OCR. PONV occurred in 10 of the 323 (3.1%) patients receiving nitrous oxide and 1 of the 52 (1.9%) that did not. Evidence for the stimulation of the oculo-cardiac reflex (OCR) occurred in 63, 4 of which (6.3%) developed PONV. Seven cases of PONV occurred in the 312 (2.2%) with no evidence of the OCR.

Within the group that stayed overnight more extensive analysis found no association between PONV and the use of any single antiemetic, analgesic, or anti-OCR agent; the use of sub-tenons local anaesthetic at the end of the operation; or any particular anaesthetist or surgeon.

647 patients were in the inguinal hernia group, of whom 97 stayed overnight: 34 for geographic reasons, and 55 were planned (due to age [n=44] and various other reasons [n=11]).

All those under 6 weeks of age and all premature infants under a gestational age of 50 weeks were admitted overnight routinely for observation. This left a group of only six whose overnight stay was unplanned. One was due to PONV, one to pain and one to late afternoon surgery. In three, no reason was evident. The unplanned overnight stay rate was therefore 1.1% (6/558). The average age of this group was 9 months, lower than that of the 6 years and 5 months of the strabismic group.

**Discussion**

The unplanned overnight stay rate in this study group after strabismus surgery was 6.4%. This is similar to the only other reported rates of 4.7%\(^1\) and 7.9%.\(^2\) This compares with a rate of 1.1% in paediatric patients undergoing inguinal hernia repairs.

It is appreciated that the age of the hernia patients was younger than the squint patients but it would be expected that there would be a higher incidence of unplanned overnight stays in this younger group. The hernia patients were the natural control group as there are large numbers, and in this study were anaesthetised in the same hospital, over the same time frame by the same paediatric anaesthetists.

The numbers of strabismus patients admitted overnight for geographic and social reasons and due to late afternoon surgery suggest that (with suitable timing of surgery and provision of suitable non-hospital accommodation) the overnight stay rate could be decreased. The preoperative assessment should be structured to identify potential social problems and schedule surgery to allow recovery. Those admitted for geographical reasons clearly could have been easily identified and catered for in other accommodation. This would have likely financial and social benefits.
Paediatric strabismus repair carries an increased risk of postoperative nausea and vomiting\(^3,4\), with mean rates as high as 59% reported from surveys\(^5\). PONV was found to be a significant cause of overnight stay, being the cause of admission in 50%, higher than the 38% described elsewhere\(^2\).

Significant relationships between PONV and the number of muscles operated on and the duration of surgery were found. These factors should be taken into account when planning the type of surgery to be performed; however, the primary responsibility is obviously to perform the surgery that will give the best visual and cosmetic outcome and further research into the suitability of single muscle surgery is required.

Association between the duration of surgery and anaesthesia and an increased risk of PONV has been found elsewhere\(^4,8\). One factor evident in this review was the wide range of anaesthetic duration. Surgeons must consider the efficiency of their techniques and be aware that prolonged surgery may have some negative consequences. This will be particularly relevant when resident teaching is occurring.

A previous study has documented an increased risk of PONV following stimulation of the OCR\(^9\), a trend that was also apparent in our study. Meta-analysis of studies reporting postoperative emesis rates has suggested a link between the use of nitrous oxide\(^6,7\), especially in high-risk groups\(^6\) such as children undergoing ear-nose-throat (ENT), strabismus, and bowel surgery. This link was suggested but not confirmed by our study.

Therefore we recommend that

- Parents are told of the 1/20 chance of an unplanned stay (i.e. we have real data for them);
- Longer squint operations and extensive operations should be done on morning lists if at all possible; and
- The use of nitrous oxide should be avoided where possible for squint operations.

Competing interests: None of the authors has a commercial interest in any of the findings presented.

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References:


Five-year experience of corneal scrapes at Wellington Eye Department, New Zealand

Kunaal Rajpal, Reece Hall, Helen Long, Anthony Wells

Abstract

**Aim** To determine the causative organisms of bacterial keratitis in Wellington and to identify the antibiotic sensitivities of each bacterium isolated. These results will then be compared with certain patient characteristics and clinical outcomes.

**Methods** Corneal scrapes collected between 2001 and 2005 were retrospectively analysed and collated on a database. Corneal scrapes were collected by an ophthalmologist and processed by trained microbiological staff.

**Results** 34 scrapes were collected; there was a positive Gram stain in 38% of cases. A positive culture was obtained in 85% of scrapes. The commonest Gram-negative organism was *Moraxella* spp. (12.5%). The commonest Gram-positive organism was coagulase-negative *Staphylococci* (25%). The Gram-negative and Gram-positive bacteria were all sensitive to chloramphenicol. Ocular surface disease was the most common risk factor.

**Conclusion** Our study shows similarities and differences with other ophthalmology centres around the World, this emphasises the recognised regional variation of bacterial keratitis. The two most important points to be taken from our results are: an accurate database for recording corneal scrape details and a protocol for testing antibiotic sensitivities and resistance needs to be established in Wellington; and a future study needs to be carried out on the next five years of corneal scrapes.

Bacterial keratitis is a serious disease which is potentially sight-threatening. Studies from different centres around the World have shown large regional variations in the types of organisms cultured for corneal scrapes.

Studies have shown there is an increasing concern regarding antibiotic resistance in the treatment of bacterial keratitis. In Wellington, ophthalmologists typically use combinations of antibiotics to cover both Gram-negative and Gram-positive organisms before they are informed of the microbiological results. This may be expensive, unnecessarily toxic to the corneal epithelium, and could be leading to the problem of antibiotic resistance. Chloramphenicol is typically used throughout New Zealand due to its broad-spectrum action, cost, and effectiveness in treating keratitis.

Predisposing factors such as contact lens wear leading to bacterial keratitis are well documented; it is well known that, trauma, and certain ocular conditions can also lead to bacterial keratitis.

The effectiveness of treatment may be measured by looking at some aspect of the patients’ clinical outcome. Recording the patients’ initial visual acuity and their visual acuity at their last consultation has been used in previous studies to assess clinical outcome.
By analysing the patient demographics and presenting ocular histories, we may be able to see if certain factors lead to different clinical outcomes.

**Methods**

This is a retrospective observational study of all microbiological corneal scrapes collected from the Wellington Microbiology Department database from 1 January 2001 to 31 August 2005. The Wellington Hospital Ophthalmology Department provides tertiary eye services to a population of approximately 400,000.

All patients suspected of bacterial keratitis were scraped for microbiological culture, Gram stain, and antibiotic sensitivity. The corneal scrapes were collected by ophthalmologists and given directly to microbiology staff. The sample was then put on a slide for Gram stain, and inoculated on sheep-blood agar, chocolate agar plates, and enrichment meat broth. A positive Gram stain was identified if a Gram-negative or Gram-positive organism was seen on light microscopy. A culture following inoculation was positive if organisms were grown along the line of inoculation.

Data collected from the microbiological reports included gram stain, type of bacteria cultured, antibiotic sensitivity, resistance, and serology when applicable.

These results were collated and matched with certain variables from the outpatients’ chart. The following variables were collected from each file: patient sex and age, visual acuity at presentation, and resolution of bacterial keratitis. Certain risk factors were also noted: contact lens wearer, ocular trauma, and pre-existing ocular conditions. All data was recorded and analysis was performed using Microsoft Excel software.

A method measuring clinical outcome using visual acuity, as used by T Bourcier et al, was used in this study. Visual acuity was recorded from the patients file at initial examination and last visit.

A “good” clinical outcome was considered when visual acuity at last visit was better than visual acuity at initial examination. A “poor” clinical outcome was considered if they had lost one to three lines of visual acuity; “very poor” was recorded if they had lost greater or equal to four lines of visual acuity or if the patient underwent keratoplasty.

**Results**

Thirty-four corneal scrapes were collected between January 2001 and August 2005. The mean age of patients was 54 years (age range 20 to 88 years). Of the 34 scrapes there was a positive Gram stain in 38% (13/34) of cases, no organisms were seen on Gram stain in 59% of cases (20/34), and in 3% (1/34) of scrapes no Gram stain result was stated.

Out of the 13 positive Gram stains, 12 correctly identified the Gram nature of organism seen on culture. One Gram stain identified Gram-positive cocci, however the culture grew *Serratia liquefaciens*.

A positive culture was obtained in 85% (29/34) of scrapes. Of the 34 scrapes, 40 micro-organisms were identified on culture; 1 patient had 3 organisms identified on culture, 9 patients had 2 organisms identified on culture, 19 patients had 1 organism identified on culture, and 5 patients had no microbes identified.

Of the 40 microorganisms grown, 7 were Gram-negative, and 33 were Gram-positive. The most frequent Gram-positive organism cultured was coagulase-negative *Staphylococci* (25%) (Table 1A). The commonest Gram-negative organism grown on the culture media was *Moraxella* spp. (12.5%) (Table 1B).

The Gram-negative bacteria were all sensitive to chloramphenicol, however 50% of *Serratia liquefaciens* were resistant to cephalothin and 25% of *Moraxella* spp. were resistant to amoxycillin.
The Gram-positive organisms were all sensitive to chloramphenicol; 88% of \textit{Staphylococcus aureus} and 10% of coagulase-negative \textit{Staphylococci} isolates were resistant to penicillin and one isolate of \textit{Streptococci pneumonia} was resistant to neomycin.

Visual acuity was noted in the 34 patients, 62% (21) patients had a “good” outcome, 17% (6) had a “poor” outcome, 9% (3) had a “very poor” outcome; 12% (4) of patients’ visual acuity was not stated; 2 of these 4 patients were lost to follow up and the remaining 2 did not have their last visual acuity documented.

Influencing factors for bacterial keratitis found in this study are shown in Table 2.

Ocular surface disease was the most common risk factor 35.2% (12); contact-lens wear [29.4% (10)] was the second most common predisposing factor.

Table 1A. Percentage of Gram-positive organisms recorded in the corneal scrapes

<table>
<thead>
<tr>
<th>Organism</th>
<th>Percentage (%)</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{Staphylococcus} (coagulase-negative)</td>
<td>25.0</td>
<td>10</td>
</tr>
<tr>
<td>\textit{Corynebacterium} spp.</td>
<td>7.5</td>
<td>3</td>
</tr>
<tr>
<td>\textit{Streptococcus pneumoniae}</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td>\textit{Staphylococcus aureus}</td>
<td>20.0</td>
<td>8</td>
</tr>
<tr>
<td>\textit{Propionibacterium} spp.</td>
<td>5.0</td>
<td>2</td>
</tr>
<tr>
<td>\textit{Peptostreptococcus} spp.</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td>\textit{Bacillus cereus}</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td>\textit{Staphylococcus epidermis}</td>
<td>15.0</td>
<td>6</td>
</tr>
<tr>
<td>\textit{Staphylococcus warneri}</td>
<td>2.5</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1B. Percentage of Gram-negative organisms

<table>
<thead>
<tr>
<th>Organism</th>
<th>Percentage (%)</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{Moraxella} spp.</td>
<td>12.5%</td>
<td>5</td>
</tr>
<tr>
<td>\textit{Serratia liquefaciens}</td>
<td>5.0%</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2. Risk factors noted for bacterial keratitis

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Wellington (n)</th>
<th>Paris\textsuperscript{2}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact-lens wearer</td>
<td>29.4% (10)</td>
<td>50.3%</td>
</tr>
<tr>
<td>Corneal trauma</td>
<td>2.9% (1)</td>
<td>15.0%</td>
</tr>
<tr>
<td>Previous surgery</td>
<td>14.7% (5)</td>
<td>4.0%</td>
</tr>
<tr>
<td>Ocular surface disease</td>
<td>35.2% (12)</td>
<td>21.3%</td>
</tr>
<tr>
<td>No risk factor</td>
<td>17.6% (6)</td>
<td>9.4%</td>
</tr>
</tbody>
</table>

Discussion

Compared to most other studies, the number of corneal scrapes in our study was low. It is therefore important to consider our results with a certain amount of practicality.

The mean age of 54 is a little higher than a previous study in Paris of 39.\textsuperscript{2} Our high positive Gram stain and culture rates are comparable to a previous study done in
Christchurch, New Zealand\textsuperscript{3}—perhaps explained by similar techniques in performing the corneal scrape and the laboratory practice in both microbiology departments. This highlights the importance of set procedures being in place for culture and Gram stain.

The numbers and types of organisms grown vary in different centres around the World (Table 3).\textsuperscript{2–6} Coagulase-negative \textit{Staphylococci} was the most prominent Gram-positive organism (25\%) as seen in many centres;\textsuperscript{3,11} there was also a surprisingly high rate of \textit{Staphylococcus aureus} reported in certain countries (e.g. Paraguay).\textsuperscript{11}

Much like the study done in Christchurch,\textsuperscript{3} our report had a surprisingly high incidence of \textit{Moraxella} \textit{spp}.

These results do allow us to observe emerging trends in causative organisms and hence highlights the importance for ongoing surveillance and monitoring antibiotic resistance.

\textbf{Table 3. Percentage of organism species isolated in corneal scrapes at different World centres}

<table>
<thead>
<tr>
<th>Organism</th>
<th>Wellington</th>
<th>Christchurch\textsuperscript{3}</th>
<th>London\textsuperscript{4}</th>
<th>Paris\textsuperscript{4}</th>
<th>India\textsuperscript{4}</th>
<th>USA\textsuperscript{5}</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{Staphylococcus} spp.</td>
<td>62.5%</td>
<td>30.5%</td>
<td>33.4%</td>
<td>37.9%</td>
<td>54.2%</td>
<td>60.60%</td>
</tr>
<tr>
<td>\textit{Streptococcus} spp.</td>
<td>5.0%</td>
<td>17.5%</td>
<td>19.0%</td>
<td>6.2%</td>
<td>14.8%</td>
<td>10.90%</td>
</tr>
<tr>
<td>\textit{Corynebacterium} spp.</td>
<td>7.5%</td>
<td>16.0%</td>
<td>0.7%</td>
<td>1.6%</td>
<td>15.1%</td>
<td>NS</td>
</tr>
<tr>
<td>\textit{Propionibacterium} spp.</td>
<td>5.0%</td>
<td>4.7%</td>
<td>0.2%</td>
<td>10.1%</td>
<td>1.5%</td>
<td>NS</td>
</tr>
<tr>
<td>\textit{Bacillus} spp.</td>
<td>2.5%</td>
<td>1.5%</td>
<td>1.1%</td>
<td>NS</td>
<td>1.3%</td>
<td>NS</td>
</tr>
<tr>
<td>\textit{Moraxella} spp.</td>
<td>12.5%</td>
<td>19.3%</td>
<td>5.9%</td>
<td>0.3%</td>
<td>1.3%</td>
<td>3.3%</td>
</tr>
<tr>
<td>\textit{Serratia} spp.</td>
<td>5.0%</td>
<td>1.5%</td>
<td>3.0%</td>
<td>3.6%</td>
<td>NS</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

NS = not specified.

All bacteria were sensitive to chloramphenicol. There was a high incidence of penicillin-resistant organisms (specifically \textit{Staphylococcus aureus}); this does not highlight any problems, however, as penicillin is not used in clinical practice.

In the Christchurch study, 100\% of Gram-positive bacteria and 89\% of Gram-negative bacteria were sensitive to chloramphenicol.\textsuperscript{3} There is an increasing awareness of ciprofloxacin resistance and its use in monotherapy in bacterial keratitis. It is therefore important to have accurate data on regional sensitivities.

Set protocols should be in place when considering which antibiotics to test. Over the last 5 years, different antibiotics were tested at different times and for different organisms—this variability needs to be corrected and a standard list of antibiotics used in clinical practice should be tested for on each case.

From our study it seems viable for monotherapy of both Gram-positive and Gram-negative organisms to be treated with chloramphenicol. Another important factor when taking into consideration antibiotic resistant results is that corneal concentrations of antibiotics can be higher than the MIC50 used in the laboratory. An organism that is said to be resistant in the laboratory may not be at higher antibiotic concentrations achieved clinically.

The most common predisposing factor recorded was ocular surface disease 35.2\%, contact lens use was second 29.4\%. In another study looking at predisposing factors
the most common risk factors were contact lens use 50.3% and ocular surface disease 21.3%. Another study showed contact lens use and ocular trauma were the two most common predisposing factors.

Clinically, according to the equivalent system used by T Bourcier et al the clinical outcomes were similar. In our study, 62% of patients had a “good” clinical outcome compared to 60% in the Paris paper. There was a difference in the proportion of poor and very poor clinical outcomes. This highlights the high morbidity associated with bacterial keratitis.

Presently there seems to be a variable number of antibiotics, which are tested. It is recommended that, collaboration between the ophthalmology and microbiology staff occurs so that a protocol can be established and standard list of antibiotics tested. Ciprofloxacin should be tested on all organisms isolated from corneal scrapes.

We would like to repeat the study in 5 years under a new protocol so that effective surveillance of the epidemiology of bacterial keratitis in the Wellington region can be monitored. This will ensure a high standard of clinical practice when treating this disease.

Competing interests: None.

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References:

The Auckland City Hospital Device Point Prevalence Survey 2005: utilisation and infectious complications of intravascular and urinary devices

Stephen Ritchie, Deborah Jowitt, Sally Roberts; on behalf of the Auckland District Health Board Infection Control Service

Abstract

**Background** In November 2005 a point prevalence survey of all inpatients at Auckland City Hospital was conducted to define the utilisation of intravascular and urinary devices; to measure the prevalence of infectious complications from these devices; and to provide quality assurance information about the use of these devices.

**Methods** All 830 inpatients admitted on a single day under paediatric; adult medical; adult surgical, and women’s health were visited by a member of the survey team and data regarding devices *in situ* was collected.

**Results** Intravenous (IV) devices were present in 376/830 patients (45%; 95%CI 42–49), and 25/830 (3%; CI 2–4) had either confirmed infection or showed signs of infection. 33/830 patients (4% CI 3–6) had intravascular devices *in situ* that were not required. Urinary devices were present in 93/830 patients (11%; CI 9–13), and 13/91 (14%; CI 8–23) had bacteriuria. A large proportion of urinary devices (19/91, 21%; CI 13–31) were found to have been inserted for inappropriate reasons.

**Conclusion** This study provides information on the current utilisation of devices in our hospital that can be extrapolated to other public hospitals in New Zealand. Healthcare workers require ongoing education to ensure prompt removal of devices that are not required for patient care.

Hospital-acquired infections (HAIs) are an important and often preventable cause of excess morbidity, mortality and cost.1–4 A report from the Office of the Controller and Auditor-General in 2003 made a number of recommendations regarding infection control practice in New Zealand hospitals.5 Recommendations were also made about the surveillance of HAIs to “provide the Minister of Health, patients, and the general public, with information about rates and types of hospital-acquired infection that is necessary for reasonable assurance about the safety and quality of public health care”. Fundamental to this ideal is the reporting of surveillance data that can be generalised across different district health boards (DHBs).

HAI can be measured in a number of ways.5,6 Perhaps the best method to determine HAI rates is to measure the cumulative incidence of infections over a defined time period, with the denominator of all admissions to hospital. This is beyond the resources of most district health boards; however targeted surveillance can be achieved. Using bloodstream infection (BSI) as an example; an estimate can be obtained by determining the rate per 1000 admissions by obtaining information only from patients with positive blood cultures. However, this method has limitations when
making comparison between hospitals as it does not measure important patient variables.

The most important risk factor for the development of HAI is the use of invasive devices: intravenous vascular catheters, urinary catheters and mechanical ventilation.\textsuperscript{7–10} A device point prevalence survey can be utilised to provide information about these important variables and can assist in data comparisons between hospitals.

In November 2005 the Auckland District Health Board (ADHB) Infection Control Service performed a hospital-wide point prevalence survey focusing on intravenous (IV) devices and urinary catheters. The primary aim of this survey was to measure the prevalence of infectious complications from these devices and to complement available surveillance data regarding HAI. The secondary aim was to provide quality assurance regarding the use of these devices in the hospital and provide information about changes that have occurred since previous point prevalence surveys were carried out at ADHB in the late 1990s.\textsuperscript{4,11}

**Methods**

**Background and setting**—ADHB has a number of localities, but devices are predominantly used by inpatient medical and surgical services in two large tertiary hospitals (Auckland City Hospital and Starship Hospital) on a single site (Grafton, Auckland). These hospitals provide a full range of tertiary services and provide secondary medical and surgical care to a population of approximately 450,000 to 500,000. There are four intensive care units on the Grafton site: Department of Critical Care Medicine, Cardiovascular Intensive Care Unit, Neonatal Intensive Care Unit, and Paediatric Intensive Care Unit.

**Data collection and ethical considerations**—The Device Point Prevalence Survey was a survey of all inpatients on the Grafton site on 23 November 2005. A census list of all inpatients at 0600 hours was obtained from Decision Support Services. Patients admitted under ADHB services that are not on the Grafton Campus and inpatient psychiatry services, where devices are not routinely used, were excluded. The rapid patient turnover in the adult and children’s emergency departments meant that the census data from 0600 hours was not valid when these departments were visited in the early afternoon. For this reason these data are not presented. None of the patients in the emergency departments had been in hospital for longer than 24 hours.

All inpatients under emergency, medical, surgical, paediatric, and women’s health services were surveyed. The survey team comprised of infection control nurse specialists, clinical microbiologists, and infectious diseases physicians; all experienced in the recognition of nosocomial infection from past surveillance studies at ADHB. To ensure that the mix of experience was adequate for the present study, practitioners reviewed patients in pairs.

Data was collected on all patients who had a device in situ. A standardised collection form was used. We modified a form previously used at the Princess Alexandra Hospital, Brisbane, Australia (Personal Communication, J Shackelroth, 2005). This form was trialled by two members of the survey team prior to the study day and the other members of the survey team subsequently received instruction in its use.

To avoid differences in interpretation between pairs of survey team members, the data was collected as “tick boxes” wherever possible. Data collected included information about the type and number of devices, the duration the device had been in situ, the reason for insertion of the device, the type of practitioner who inserted the device, and whether any signs or symptoms attributable to the device itself were present. Information was obtained by patient interview, nursing staff, medical staff and from clinical records. All devices were inspected by a member of the survey team.

Urinary devices were considered to have been inserted for inappropriate reasons according to the criteria of Gokula et al.\textsuperscript{12} Immobility and incontinence were considered to be appropriate reasons only if alternative measures were considered to be of risk to the patient—e.g. fracture or contamination of a wound or surgical site.

A study description was submitted to the Northern X Ethics committee, who advised that formal ethical approval was not required for a quality assurance audit.
Measuring infectious complications—Infectious complications were defined by the presence of positive microbiological cultures in patients with a device present on the day of the survey. This was performed by database matching between the patients with devices in situ and the microbiology laboratory database. The laboratory database provided a list of all positive cultures from blood and urine 4 days before and after the survey date, and from catheter tips 7 days following the survey date. All intravenous devices were inspected for signs of infection: pain, redness, swelling, and purulent discharge.

When a match was found between the databases, or if any signs of infection were identified on inspection, then the full clinical records were reviewed by the infection control team to determine the significance of each episode. Urinary infection was defined as a colony count \( \geq 10^6 \text{/ml} \) of a recognised pathogen.\(^1\)

Data analysis—Data is presented by service according to the following groupings: adult medical, adult surgical, women’s health, paediatric (combined medical and surgical), adult intensive care, and paediatric intensive care. This survey was a descriptive study and data is presented numerically with proportions and 95% confidence intervals. Testing for statistical significance was performed by two-tailed Fisher’s exact test.

Results

A total of 910 patients were present on the 0600 census. 830 patients met the criteria for inclusion after 18 patients who were not available for review were excluded. Intravenous (IV) devices were present in 376/830 (45%; 95%CI 42–49); urinary devices were present in 93/830 (11%; CI 9–13), and 74/830 (9%; CI 7–11) had both in situ.

Intravenous devices—A total of 490 IV devices were present in 376 patients; device utilisation by service is shown in Table 1 and the number of intravenous devices by type of device is shown in Table 2.

<table>
<thead>
<tr>
<th>Service</th>
<th>Number of patients</th>
<th>Number of patients with an IV device</th>
<th>Number of patients with a urinary device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td>306</td>
<td>111 (36%; 31-42)</td>
<td>22 (7%; 5-11)</td>
</tr>
<tr>
<td>Surgical</td>
<td>195</td>
<td>110 (56%; 49-63)</td>
<td>34 (17%; 12-23)</td>
</tr>
<tr>
<td>Paediatric</td>
<td>142</td>
<td>84 (59%; 51-67)</td>
<td>5 (4%; 1-8)</td>
</tr>
<tr>
<td>Women’s health</td>
<td>116</td>
<td>29 (25%; 17-33)</td>
<td>11 (10%; 5-16)</td>
</tr>
<tr>
<td>Adult ICU</td>
<td>19</td>
<td>19 (100%; 82-100)</td>
<td>17 (90%; 67-99)</td>
</tr>
<tr>
<td>Paediatric ICU</td>
<td>52</td>
<td>23 (44%; 31-59)</td>
<td>4 (8%; 2-19)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>830</strong></td>
<td><strong>376</strong></td>
<td><strong>93</strong></td>
</tr>
</tbody>
</table>

Percentages and 95%CI are given in parentheses.

The majority of IV devices were inserted by doctors and nurses; only 14/490 (3%; CI 1–5) were inserted by phlebotomists or medical students. The reasons for the insertion and retention of the IV devices are shown in Table 3. No reason could be identified for 33/490 devices (7%; CI 5–9) in 33/830 patients (4%; CI 3–6); all of these were peripheral IV cannulae.

Greater than one device was present in 13/33 (39%; CI 23–58) patients when only one was required; 11/33 (33%; CI 18–52) had been in situ for longer than 72 hours and 4/33 (12%; CI 3–28) exhibited signs of infection.
Table 2. The numbers of different intravenous (IV) devices used in 376 patients; percentages are expressed as a proportion of the total number of IV devices (490) used.

<table>
<thead>
<tr>
<th>Type of IV device</th>
<th>Number (%; 95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral cannula</td>
<td>345 (70%; 66–74)</td>
</tr>
<tr>
<td>Non-tunnelled CVL*</td>
<td>56 (11%; 9–14)</td>
</tr>
<tr>
<td>PICC^</td>
<td>26 (5%; 4–8)</td>
</tr>
<tr>
<td>Arterial</td>
<td>24 (5%; 3–7)</td>
</tr>
<tr>
<td>Other, e.g. umbilical</td>
<td>12 (2%; 1–4)</td>
</tr>
<tr>
<td>Tunneled CVL*</td>
<td>10 (2%; 1–4)</td>
</tr>
<tr>
<td>Port-a-Cath</td>
<td>10 (2%; 1–4)</td>
</tr>
<tr>
<td>Haemodialysis catheter</td>
<td>7 (1%; 1–3)</td>
</tr>
<tr>
<td>Total</td>
<td>490</td>
</tr>
</tbody>
</table>

Percentages and 95%CI are given in parentheses; *CVL = central venous line; ^PICC = peripherally inserted central catheter.

Table 3. The reasons for insertion and retention of 490 intravenous (IV) devices in 376 patients

<table>
<thead>
<tr>
<th>Reason for IV device</th>
<th>Number (%; 95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotics</td>
<td>156 (32%; 28–36)</td>
</tr>
<tr>
<td>Hydration</td>
<td>134 (27%; 23–31)</td>
</tr>
<tr>
<td>Other IV medication</td>
<td>109 (22%; 19–26)</td>
</tr>
<tr>
<td>Surgery / anaesthesia</td>
<td>62 (13%; 10–16)</td>
</tr>
<tr>
<td>No reason identified</td>
<td>33 (7%; 5–9)</td>
</tr>
<tr>
<td>TPN*</td>
<td>23 (5%; 3–7)</td>
</tr>
<tr>
<td>Transfusion</td>
<td>22 (5%; 3–7)</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>16 (3%; 2–5)</td>
</tr>
<tr>
<td>Other (e.g. blood pressure monitoring)</td>
<td>14 (3%; 2–5)</td>
</tr>
</tbody>
</table>

The percentages are expressed as a proportion of the number of devices and more than one reason could be given for each device; *TPN = total parenteral nutrition.

Peripheral IV cannulae—Overall, 345 peripheral IV cannulae were present in 305/830 patients (37%; CI 34–40); only paediatric patients had peripheral IV cannulae sited in the lower limb. Most of the peripheral IV cannulae had been in situ for 24 to 48 hours but 42/345 (12%; CI 9–16) of these had been in situ for longer than 72 hours. Determining the duration that a peripheral IV cannula had been in situ was greatly facilitated by the presence of the date of insertion recorded on the IV dressing of 149/345 cannulae (43%; CI 38–48). Phlebotomists were more likely to date cannulae they had inserted (13/13, 100%; CI 75–100) compared to all others (136/332, 41%; CI 36–46) p<0.001; and nurses were more likely to date cannulae they had inserted (46/86, 54%; CI 42–64) when compared to doctors (90/232, 39%; CI 33–45) p=0.022. The remaining peripheral cannulae were inserted by midwives and medical students.

Recording the date of insertion on dressings did not help to ensure that cannulae remained in situ less than 72 hours: when the date was recorded 19/149 devices remained in situ for more than 72 hours (13% CI 7–18) compared to 23/196 devices without the date recorded (12% CI 7–16) p=0.87. This is inclusive of the paediatric
service where the date is not routinely recorded as cannulae are not changed unless they are not working or if signs of infection are present.

**Infection of intravenous devices**—Signs of infection (pain, swelling, erythema and/or purulent discharge) were found in 22/345 (6%; CI 4–10) peripheral IV cannulae. Only one of these had microbiological assessment (an exit site swab) yet this device was retained. There was an increase in signs of infection if the device had been *in situ* longer than 72 hours (6/44; 14%) compared with those *in situ* less than 72 hours (16/301; 5%); p=0.047.

There were three microbiologically confirmed infections of devices *in situ* on the day of the survey. The first was an infection of a non tunneled central venous line (CVL) caused by *Acinetobacter calcoaceticus* isolated from blood cultures and catheter tip culture. The second and third were caused by *Staphylococcus aureus* infection of an umbilical venous line and of a Hickman’s CVL. All three patients had their lines removed and received appropriate antibiotic therapy.

Confirmed infection of an IV device was seen in 3/376 patients with vascular devices *in situ* on the day of the survey (0.8%; CI 0.1–2); when suspected infection of peripheral cannulae is included this rose to 25/376 (7%; CI 4–10) as shown in Table 4.

**Table 4. The prevalence of microbiologically confirmed infection and suspected peripheral intravenous (IV) cannula infection per inpatient, device, and patient with device *in situ***

<table>
<thead>
<tr>
<th>Infection prevalence</th>
<th>Peripheral IV cannula with signs of infection present (%; 95% CI)</th>
<th>Microbiologically proven infection (%; 95% CI)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per total inpatients</td>
<td>22/830 (3%; 2–4)</td>
<td>3/830 (0.3%; 0.07–1)</td>
<td>25/830 (3%; 2–4)</td>
</tr>
<tr>
<td>Per device</td>
<td>22/345 (6%; 4–10)</td>
<td>3/490 (0.6%; 0.1–2)</td>
<td>25/490 (5%; 3–7)</td>
</tr>
<tr>
<td>Per patient with device <em>in situ</em></td>
<td>22/305 (7%; 5–10)</td>
<td>3/376 (0.8%; 0.1–2)</td>
<td>25/376 (7%; 4–10)</td>
</tr>
</tbody>
</table>

Percentages and CI are given in parentheses.

**Urinary devices**—Urinary drainage devices were utilised in 93/830 patients (11%; CI 9–13); the utilisation by Service is shown in Table 1. Two patients had suprapubic catheters and the remaining 91 had per-urethral indwelling catheters (IDC). The majority of the IDCs had been *in situ* for less than 1 week (64/91 (70%; CI 60–79) and only 3/91 (3%; CI 0.6–9) had been *in situ* for greater than 1 month.

Documentation regarding IDC insertion was only found in 56/91 (62% CI 51-72); in the remainder the reasons for insertion were obtained from nursing or medical staff and are shown in Table 6. One in five IDCs were considered to have been inserted for inappropriate reasons (19/91, 21%; CI 13–31). In 4 cases, no reason for insertion could be identified; 3 were inserted for incontinence; and 12 were inserted for immobility.
Table 6. The reason for insertion and retention of per urethral indwelling urinary catheters (IDC) in 91 patients

<table>
<thead>
<tr>
<th>Reason for IDC</th>
<th>Number (%; 95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perioperative</td>
<td>34 (37%, 27-48)</td>
</tr>
<tr>
<td>Urine output measure</td>
<td>24 (26%, 18-37)</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>20 (22%, 14-32)</td>
</tr>
<tr>
<td>Immobility</td>
<td>15 (17%, 10-26)</td>
</tr>
<tr>
<td>Incontinence</td>
<td>5 (6%, 2-12)</td>
</tr>
<tr>
<td>Unknown</td>
<td>4 (4%, 1-11)</td>
</tr>
<tr>
<td>Palliative care</td>
<td>1 (1%, 0.3-6)</td>
</tr>
</tbody>
</table>

The percentages are expressed as a proportion of the number of IDCs and more than one reason could be given for each IDC. 19/91 (21% CI 13-31) were considered to have been inserted for inappropriate reasons.

Complications of urinary devices—One in five patients had the urinary drainage bag level with or above the level of the IDC (18/91, 20%; CI 12–29) which allows reflux of urine back into the bladder. Five patients had symptoms related to their IDC (6%; CI 2–12) but only one had microbiological assessment performed.

None of the patients with urinary devices in situ had bacteraemia, but 13/91 (14%; CI 8–23) had bacteriuria. Even though none of these patients had symptoms, eight patients received treatment in response to these culture results, and only one had their IDC removed.

Discussion

This survey, conducted at Auckland City Hospital in November 2005, has documented the point prevalence of device related infections in context of the utilisation of IV and urinary devices. Of concern, 7% of patients with a vascular device in situ had evidence of infection associated with the device and 6% of patients with IDC had symptoms suggestive of infection.

Whilst only one of five patients with an IDC with symptoms suggestive of infection was investigated, 8 of 13 patients with asymptomatic bacteriuria received antibiotics unnecessarily. The present study has also raised a number of important issues regarding infection control and minimisation of device related infection.

When compared to surveys performed yearly between 1996 and 2001 at ADHB, the prevalence of peripheral IV cannula and IDC usage has not changed; yet the use of central venous lines was approximately 1.6 times higher than in any of those years. Hospital-acquired bloodstream infection is more likely to complicate central venous lines than peripheral IV cannula, yet peripheral cannula do need to be inspected frequently. There is a clear association between clinical signs of intravascular device infection and microbiologically confirmed infection.

The current policy at ADHB is to remove peripheral cannulae after 96 hours; we plan to review this policy as the present study found that peripheral IV cannulae that had been in situ for more than 3 days were more likely to exhibit signs of infection: pain, erythema, swelling and/or pus.

The majority of peripheral IV devices did not have the date recorded on them when inserted, however, in the present survey, recording the date of insertion on the IV dressing did not appear to influence the duration that the device remained in situ.
Regardless, recording the date of insertion on the dressing is simple and with further education will facilitate the timely removal of peripheral cannulae.

We were able to identify a number of patients who had peripheral cannulae in situ which were not in use. In most cases this appears to have occurred when a cannula that had been in use was no longer required. The prevalence of unnecessary IDCs was also high, but not as high as other reports. Alternatives to placement of IDCs should be employed whenever possible; the use of non-invasive urinary drainage devices have been shown to reduce adverse events and death.

The present study has identified that doctors and nurses are equally responsible for the placement and maintenance of invasive devices and should be targeted for education strategies.

Our education strategies will highlight the following recommendations:

- Devices that are not required should be promptly removed;
- In adult services, peripheral cannulae should be exchanged after 3 days;
- All IV lines should be inspected twice each day;
- Peripheral cannulae should be removed if signs of infection are present;
- The date of insertion should be clearly recorded on the dressing of all peripheral cannulae;
- Non-invasive means of urinary drainage should be utilised whenever possible;
- The reason and time of placement of urinary devices should be clearly indicated in the clinical record;
- Urine specimens should only be obtained if infection is suspected;
- In most cases, prompt removal of urinary catheters will provide sufficient treatment.

This point prevalence survey has complemented other surveillance data collected at our institution and has highlighted a number of areas for improvement. We believe that the results from adult medical, surgical, and women’s health services may be able to be generalised to other secondary care facilities in New Zealand, where the patient mix and provision of care are likely to be very similar.

It is highly likely that the issues identified in this study, that is, the retention of IV devices in situ beyond the recommended length of time and the placement of IDC’s for inappropriate reasons, occur at other hospitals in New Zealand.

The cost of HAI for the ADHB was estimated in 1999 at $23 million. Most of this additional cost falls on the hospital sector and relates to increased length of stay. Recent estimates from the UK suggest that about 15% of all HAI can be avoided.

The prompt removal of invasive devices when they are no longer required or when early signs of infection are present are important manoeuvres to reduce both the incidence and significant cost of HAI. Healthcare workers require ongoing education to ensure they undertake infection control practices such as hand hygiene, as well as simple measures aimed at reducing device related infections.

Put simply: for any invasive device, if it is not needed, remove it.
Competing interests: None.
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Acknowledgments: We acknowledge these ADHB staff who assisted with the survey: members of the Infection Control Service, clinical microbiologists, microbiology registrars, infectious diseases physicians, and registrars.

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References:

An outbreak of infectious syphilis in Wellington, New Zealand

Ruth Cunningham, Jane MacDonald, Margot McLean, Caroline Shaw

Abstract

Aims To estimate the incidence of infectious syphilis in the Wellington region between 2004 and 2006, and to characterise those with infectious syphilis, in terms of demographic and risk factors, in order to inform control of the disease.

Methods Based on information from regional laboratories, a questionnaire was sent to the requesting clinician for all individuals with positive syphilis serology between January 2004 and December 2005. The questionnaire was also used for cases of infectious syphilis seen at regional sexual health clinics in 2006. All information was recorded anonymously.

Results 120 questionnaires were returned (67%), and 15 cases of infectious syphilis were identified (5 in 2004, 10 in 2005), including 3 cases not known to the sexual health clinics and hence not reported to the Institute of Environmental & Scientific Research (ESR). Another 15 cases of infectious syphilis were identified from sexual health clinic records in 2006 up to October. These 30 cases of infectious syphilis were predominantly men who have sex with men (MSM) (80%), and mainly born in New Zealand (83%). Few cases reported recent sex overseas, indicating local transmission, and anonymous partners were common. The annual incidence (per 100,000 population) of infectious syphilis is estimated at 1.3 in 2004, 2.6 in 2005, and 5.9 in 2006.

Conclusion Wellington is experiencing an outbreak of infectious syphilis, principally amongst MSM, but with crossover into the heterosexual community. Efforts are being made to control this outbreak through education of clinicians, partner notification, and offering screening and education in non-medical settings to at risk groups. We call on the Ministry of Health to enhance syphilis surveillance as a matter of urgency.

Syphilis is a sexually transmitted disease that was a significant cause of morbidity and mortality until the 1940s, when the introduction of effective treatment with penicillin led to a dramatic reduction in new cases of syphilis, at least in developed countries. Since that time, syphilis has been relatively rare in developed countries, but with periodic outbreaks in specific communities, including men who have sex with men (MSM). Syphilis, however, continues to be prevalent in many developing countries, including some Pacific Island nations such as Samoa.

Syphilis is caused by the spirochaete Treponema pallidum subspecies pallidum. Primary syphilis can present with a classical painless ulcerative lesion (chancre), which heals spontaneously over a few weeks.
If untreated, secondary syphilis, characterised by muco-cutaneous lesions (Figures 1 and 2), variable body rash (Figures 3 and 4), and lymphadenopathy develops after a few weeks to months. However, both stages can be asymptomatic or unrecognised, or can present with a variety of systemic illnesses including focal neurological deficit, meningitis, or liver disease.

Figure 1 Figure 2

Figure 3 Figure 4

Untreated syphilis remains infectious for up to 1 year, and if left untreated one-third of cases will progress to tertiary syphilis years later. Syphilis in pregnancy results in a high rate of perinatal death or complications, and vertical transmission can occur up to 5 years after infection if untreated. Syphilis cannot be distinguished from other treponemal disease such as yaws by serological blood tests alone and a high degree of suspicion and good clinical assessment are extremely important.

Since 2000, an increase in new syphilis infections has been noted in the major cities of the US, Canada, Europe, and Australia, mainly among MSM disproportionately infected with HIV.\textsuperscript{1–4} Recent outbreaks in the United Kingdom have also been characterised by increasing rates amongst heterosexual men and women, which is of particular concern because of the potential for congenital syphilis infections.\textsuperscript{5} The geographic dissemination of this increase in developed countries is thought likely to be related to frequent travel and the use of the Internet to recruit sexual partners.\textsuperscript{3}
In New Zealand, infectious syphilis remains rare, with between 13 and 47 cases reported to Institute of Environmental & Scientific Research (ESR) per year by sexual health clinics between 2000 and 2005. However, a recent review of Auckland Sexual Health Clinic data, from 2002 to 2004, suggested that syphilis was becoming an increasing problem in Auckland.6 With an increasing number of cases seen at Wellington sexual health clinics over 2005–6, it was suspected that Wellington was facing a similar issue.

Syphilis surveillance in New Zealand is sentinel in nature, occurring through reporting of infectious syphilis (primary, secondary, and early latent) cases diagnosed by sexual health and family planning clinics. Cases diagnosed in other settings such as primary care and through antenatal or immigration screening are not reported nationally. In addition, there is currently no capacity for laboratory-based surveillance. It is therefore difficult to characterise syphilis in New Zealand from available routine data.

The aims of this study were to estimate the incidence of new diagnoses of infectious syphilis in the region, and to characterise those with infectious syphilis in terms of demographics and risk factors, in order to inform control of the disease.

Methods
Cases of syphilis were identified from data from laboratories in Wellington and the Hutt Valley, and were defined as all individuals who had positive serological syphilis tests between January 2004 and December 2005, inclusive. The serological screening tests used for the time period of this study were the non-treponemal tests RPR (rapid plasma reagin) or VDRL (venereal disease research laboratory), both reasonably equivalent non-specific tests, which give a dilutional titre ratio indicating stage of disease or effectiveness of treatment, and the specific treponemal test TPHA (treponemal pallidum haemaglutination assay) or TPPA. The confirmatory test was either FTA (fluorescent antibody test) or ITP (immunochromic treponemal pallidum test). Results were presumed to be false positive if RPR was < 1:4 and all other were tests negative, and were not included in the study.

A questionnaire was sent to the requesting health practitioners (general practitioners (GPs), hospital based specialists, and sexual health specialists) for each positive serological result (except false positives). This questionnaire requested basic demographic information as well as information on the reason for testing, symptoms, the stage of disease, and any treatment, referrals, and contact tracing. Questionnaires were anonymous, with a unique number assigned to each person. Information obtained from questionnaires was checked against sexual health clinic records, to ensure that no cases of primary or secondary syphilis known to sexual health services were missed. Demographic information was also obtained from ESR on all cases of infectious syphilis reported from the region in 2004 and 2005 and matched against questionnaire information.

A clinician at Wellington Sexual Health Services used the same questionnaire to extract information from clinical notes on cases of primary and secondary syphilis diagnosed at Wellington sexual health clinics between January and October 2006. 2006 data was not obtained from laboratories, but sexual health clinic data from 2006 was examined because of an anecdotal continuing increase in cases. For the purposes of this study, infectious syphilis was defined as primary or secondary syphilis, identified as such by practitioners, and in keeping with clinical, demographic and laboratory information. Where a discrepancy was noted between the identified stage of disease and other information, practitioners were telephoned to confirm the diagnosis.

While early latent syphilis may be infectious, it was not possible in this survey to distinguish with certainty cases of infectious latent syphilis from non-infectious latent syphilis. This is due to the difficulty in establishing the time of infection. This differs from ESR, which reports cases of primary, secondary, and early latent syphilis as infectious syphilis. Thus ESR national surveillance reports include cases of infectious syphilis not identified as infectious in this study (i.e. early latent cases). However, due to the difficulties in establishing time of infection, and because primary and secondary cases reflect recent transmission, early latent cases were not included in this study.
Questionnaire data were analysed using EpiData and EpiInfo software (EpiData Association, Denmark). The 2001 census population for Capital and Coast District Health Board (DHB) and Hutt Valley DHB was used as the denominator for incidence rate calculations. For 2006, the rate was estimated based on the assumptions that 20% of new cases of infectious syphilis are not seen by sexual health services, and that new cases will continue to be diagnosed at the same rate for the remainder of 2006.

The Wellington Regional Ethics Committee approved this study (approval reference: CEN/05/11/084).

Results

General information—A total of 175 individuals tested positive for syphilis in the region in 2004–5: 55% male and 45% female, median age 49 years (range 18–83 years). Of the questionnaires sent out, 67% were returned. Four were incomplete and were excluded (but were unlikely to have had infectious syphilis from the information received). A further two were excluded because they were duplicates.

The final sample of 114 had a slightly younger age profile than the original sample (range 18–82, median 47 years). The gender distribution of the returned surveys was similar to the overall sample (57% male, 43% female). Based on demographic and laboratory information available for those on whom questionnaires were not received, it is very unlikely that any of the 57 individuals for whom surveys were not returned had infectious syphilis, although this cannot be entirely ruled out.

Of the 114 individuals about whom information was received, 15 were reported to have had primary or secondary syphilis (5 in 2004 and 10 in 2005). Forty-two cases were identified as latent syphilis in the surveys, and one case as congenital syphilis (in an adult born overseas). For the remaining 56 cases, the stage of disease was reported as “unknown” (the clinician commented that the likely diagnosis was yaws in 16 of these cases).

Based on clinical, demographic, and laboratory information (no symptoms or neurological symptoms, history of past treatment, older age, low or non-reactive RPR/VDRL), the remaining 40 were highly likely to have had latent untreated or treated syphilis.

Table 1 compares the characteristics of those with infectious syphilis with those thought to have latent syphilis or yaws.
Table 1. Syphilis cases in the Wellington region: reason for testing, place of birth, and treatment by stage of disease (January 2004 to December 2005)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Stage of disease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infectious syphilis</td>
</tr>
<tr>
<td></td>
<td>(n=15)</td>
</tr>
<tr>
<td></td>
<td>Latent syphilis and yaws</td>
</tr>
<tr>
<td></td>
<td>(n=99)</td>
</tr>
<tr>
<td>Reason for testing</td>
<td>12</td>
</tr>
<tr>
<td>Immigration</td>
<td>2</td>
</tr>
<tr>
<td>Antenatal</td>
<td>3</td>
</tr>
<tr>
<td>Symptoms</td>
<td>1</td>
</tr>
<tr>
<td>Risk factors</td>
<td>2</td>
</tr>
<tr>
<td>Contact</td>
<td>1</td>
</tr>
<tr>
<td>Dementia screen</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
</tr>
<tr>
<td>Place of birth</td>
<td>13</td>
</tr>
<tr>
<td>New Zealand</td>
<td>15</td>
</tr>
<tr>
<td>Samoa</td>
<td>31</td>
</tr>
<tr>
<td>Other Pacific (e.g. Fiji)</td>
<td>7</td>
</tr>
<tr>
<td>Africa</td>
<td>15</td>
</tr>
<tr>
<td>China</td>
<td>5</td>
</tr>
<tr>
<td>India</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>19</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
</tr>
<tr>
<td>BenzPen × 1 dose (intramuscular)</td>
<td>7</td>
</tr>
<tr>
<td>BenzPen × 3 doses (intramuscular)</td>
<td>1</td>
</tr>
<tr>
<td>Doxycycline (oral)</td>
<td>1</td>
</tr>
<tr>
<td>Referred to sexual health</td>
<td>5</td>
</tr>
<tr>
<td>Referred to ID physician</td>
<td>1</td>
</tr>
<tr>
<td>No treatment</td>
<td>46</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
</tr>
</tbody>
</table>

BenzPen=Benzathine Penicillin 2.4 MU.

**Infectious syphilis in the Wellington region 2004–5**—The crude incidence rate of infectious syphilis was 1.3 per 100,000 in 2004 and 2.6 per 100,000 in 2005. All cases occurred in individuals aged 15–44 years—thus giving age-specific rates of 2 per 100,000 in 15–24 year olds and 5 per 100,000 in 25–44 year olds in 2004; and 9 per 100,000 in 15–24 year olds and 6 per 100,000 in 25–44 year olds in 2005.

Of the 15 cases identified in this survey as having infectious syphilis, 12 were known to Wellington Sexual Health and had been reported to ESR (7 seen initially at the sexual health clinics, and a further 5 referred there for treatment after diagnosis in general practice).

According to ESR data, 16 reports were received from the region over 2004–5, however the additional 4 individuals were not included in the “infectious” group in this study as they had early latent syphilis. An additional 3 cases of infectious syphilis not previously known to sexual health services were identified by this study. GPs saw 2 of these cases, and the third was seen in hospital. These cases are not reflected in national surveillance statistics and represent a 20% undercount of regional cases.
Of the 15 people diagnosed with infectious syphilis in 2004 and 2005, 13 were born in New Zealand, and the median age was 25 years (range 18–43). Most cases had clear risk factors, including at least 2 who were known contacts of cases of syphilis at presentation, 5 who were known to have visited male sex-on-site venues, 2 who had had recent sexual encounters overseas (1 heterosexual, 1 homosexual), and 11 who were men who have sex with men (MSMs). One of the 15 cases was identified as HIV-positive.

Ninety-three percent of those with infectious syphilis presented with symptoms. Symptoms included classic chancre (painless genital ulceration) (4), painful genital ulceration (2), lymphadenopathy (2), body or sole/palm rash (5), mouth ulceration (4), and retinitis (1). However, it should be noted that those with symptoms are more likely to present to health services and more likely to be tested for syphilis, and therefore are more likely to have their syphilis diagnosed, than those who are asymptomatic.

Contact tracing was attempted for 13 of the 15 people with infectious syphilis, (including 4 referred to sexual health services or other providers for contact tracing). For 2 people, contact tracing could not be done because of anonymous partners. In the other cases, between 1 and 5 contacts were identified per case, with other contacts being untraceable because they were anonymous.

**Infectious syphilis in the Wellington region 2006**—Fifteen additional cases of infectious syphilis were diagnosed in Wellington, Hutt, and Porirua sexual health clinics (SHCs) between January and October 2006. This is likely to be an undercount, as evidenced by preceding year’s figures. However, even based on sexual health clinic data alone, this represents an increase in cases of infectious syphilis in Greater Wellington in 2006 (see Figure 5). The annual incidence rate of infectious syphilis for 2006 is estimated at 5.9 per 100,000 population.

**Figure 5. New cases of infectious syphilis in the Wellington region (January 2004 to October 2006)**
The 15 cases diagnosed at SHCs in 2006 were similar to previous years’ cases—predominantly New Zealand-born MSM, of New Zealand European or Māori ethnicity—although they were older, with a median age of 36 years (range 18–48). One was asymptomatic, and the rest presented with chancre or rash.

Identified risk factors included visiting a male sex-on-site venue (4), sex overseas (4), visiting a sex worker (1), being a known contact of a case (1), and being HIV-positive (1).

Contact tracing was unable to be performed for six cases because all partners were anonymous, and only one contact was able to be traced and tested for each of the remaining cases (likely the regular partner of the case).

Table 2 and Figure 6 show demographic and sexual behaviour information for all known cases of infectious syphilis identified between January 2004 and October 2006. Note that 2004 and 2005 data include all cases because complete laboratory data was obtained, however 2006 data only use sexual health clinic information up until October.

### Table 2. Sexual behaviour and demographic characteristics of infectious syphilis cases in the Wellington region (January 2004 to October 2006)

<table>
<thead>
<tr>
<th>Variables</th>
<th>2004 (n=5)</th>
<th>2005 (n=10)</th>
<th>2006 (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sexual behaviour</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men who have sex with men</td>
<td>4</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Heterosexual men</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Heterosexual women</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NZ European</td>
<td>3</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>NZ Māori</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Pacific</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Not specified</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15–24 years</td>
<td>1</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>25–34 years</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>35–44 years</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>45–55 years</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

As seen in Figure 2, syphilis is an increasing problem amongst MSM in their 30s and 40s in the Wellington region, with transmission also occurring in younger heterosexuals of both genders (particularly men)
Discussion

Infectious syphilis is a disease of considerable public health importance. It is a highly infectious disease, and more readily transmitted than most STIs, including by oral sex. Moreover, the presence of syphilitic lesions in either partner make HIV transmission much more likely. Syphilis is particularly serious when acquired in pregnancy, and can result in congenital abnormalities or stillbirth if the mother is not treated. Syphilis can be hard to diagnose, with a myriad of possible presentations, including no symptoms. However, syphilis is preventable through safer sexual practices, and very readily treated, with a single dose of intramuscular (IM) long-acting penicillin being adequate in early cases. Recognition by providers and the affected community—as well as good diagnosis, treatment, and contact tracing procedures—are essential for the control of syphilis outbreaks such as the one described in this article.

Many syphilis tests are done throughout New Zealand every year, especially for immigration and antenatal screening. However, infectious syphilis represents a very small proportion of positive tests for syphilis. Many immigration screening tests are detecting old syphilis or yaws, especially in those born in the Pacific (particularly in Samoa), and from the information available it seems that no cases of primary or secondary syphilis were found in routine immigration screening over 2004–5. One case of possible early latent syphilis in pregnancy was diagnosed via antenatal screening in 2005 and treated.

Annual incidence rates for the Greater Wellington region were estimated at 1.3, 2.6, and 5.9 per 100,000 population for 2004, 2005, and 2006 respectively. There is no national incidence data to compare these rates to, because national surveillance data are reported as a percentage of sexual health clinic visits only.

By international standards, the rates in New Zealand remain low (for example, cities in the United States have reported rates of around 20 per 100,000 population, while in the former Soviet Union rates of over 200 per 100,000 have been reported in recent years), however the increasing trend is concerning.

Following the pattern seen in other developed countries, Greater Wellington is experiencing an outbreak of infectious syphilis, principally amongst MSM, but with
some crossover into the heterosexual community. Indeed, evidence from international research shows that changes in the MSM community—such as serosorting of sexual partners (choosing partners with the same HIV status), switching from anal to oral sex (which reduces the risk of transmission of HIV, but not syphilis), disinhibition related to treatment optimism for HIV, and the longer lifespan of highly sexually active HIV-infected MSM—are contributing to the epidemic of syphilis internationally.\(^3\)

The increasing use of stimulants and Viagra® (sildenafil citrate) has also led to less condom use and more risky sexual activity among MSM.\(^6,10\) It is likely that this outbreak reflects similar changes in the MSM community locally.

Following a comprehensive prevention campaign driven by the MSM community, HIV diagnoses in New Zealand declined in the 1990s, even before the introduction of effective treatment for HIV in 1996.\(^11\) However, after this initial success, HIV diagnoses among MSM have been increasing steadily since 2000, with the increase being entirely due to local infections.\(^12\) This pattern is thought to reflect increasing sexual risk taking in the MSM community, and the increasing prevalence of other STIs that make HIV more transmissible (such as syphilis).\(^13\)

Most infectious syphilis in Greater Wellington is either diagnosed in sexual health clinics or referred to sexual health clinics for treatment, and therefore reported to ESR. However, this study has found that 20% of cases in 2004 and 2005 were seen and treated in primary care and hospital settings, and therefore not being reported under the current surveillance system. There are several potential ways that surveillance could be improved, including making infectious syphilis reportable in a similar way to HIV (anonymously through the diagnosing clinician) or an enhanced passive surveillance system whereby positive laboratory tests elicit a request for further information from the ordering clinician.

Laboratory tests distinguish most infectious syphilis, except very early syphilis where RPR/VDRL titres may be very low. In 6 of the 30 cases of infectious syphilis in this study RPR titres were less than 1:8, and would have been missed if a laboratory cut off for reporting was used. However, the introduction of EIA (Enzyme Immunoassay) as a screening test in the Wellington region may simplify the diagnosis of early syphilis.

**Managing the outbreak**—Infectious syphilis has increased in the Greater Wellington region over the past 3 years. Cases are predominantly amongst MSM and mainly locally acquired, potentially through sex-on-site venues. These factors mean education and syphilis testing at sex-on-site venues will form an important part of the control of the current outbreak.

Syphilis is a disease that very few clinicians aged under 50 in developed countries are familiar with. Therefore, it is often not a differential diagnosis when seeing patients with non-specific symptoms, such as rash or generalised lymphadenopathy. Moreover, if a sexual history is not obtained, at-risk people without symptoms will not be offered a test.

For these reasons, educational initiatives for clinicians are required to ensure timely diagnosis and treatment to prevent ongoing transmission. The questionnaire sent to GPs in this study was accompanied by a letter alerting them to the recent increase in
infectious syphilis in the region. It is also hoped that this article itself will alert GPs and other clinicians to the problem.

Identification and notification of sexual contacts of cases is also crucial to prevent further spread of the disease. GPs are generally not resourced or trained to follow up sexual contacts, and while Public Health Units have considerable skill in contact tracing, they are not funded for sexually transmitted infection (STI) management. Contact tracing is therefore mostly done by sexual health clinic staff, and referral to sexual health clinics for this purpose is encouraged. Anonymous partners present an additional problem for contact tracing, and most of the cases identified in this study had at least one anonymous partner.

To control this outbreak, the Wellington Sexual Health Service, together with the local AIDS Foundation, has instituted an outreach service to provide testing for syphilis at two male sex-on-site venues in Wellington. This service aims to raise awareness of syphilis in that community, and to provide information and offer testing.

This programme is in line with international experience in controlling syphilis outbreaks amongst MSM. For example, screening has been conducted at a wide variety of non-medical MSM-orientated venues in major United States cities, and while a relatively low number of cases have been found by this method, the secondary benefits such as increasing awareness and prompting early treatment through symptom recognition, are felt to be substantial.14

Conclusions and recommendations

Infectious syphilis is an increasingly important public health issue in Greater Wellington and Auckland,6 and local initiatives have been instigated to reduce transmission. However there are serious limitations in national syphilis surveillance, and to control this outbreak, improvements to this system are essential.

Competing interests: None.

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Vibrator-induced fatal rectal perforation

Naseem G Waraich, James S Hudson, Syed Y Iftikhar

Abstract

A middle-aged man was admitted to our hospital with abdominal pain and bleeding per rectum. Subsequent laparotomy indicated an established faecal peritonitis in relation to an anterior perforation of the upper rectum. He later volunteered that he had anal intercourse 2 days previously with a vibrator at an erotic party. His partner volunteered further information regarding deviant practice such as regular insertion of other foreign objects (e.g. shower hose).

Tearing of the rectal mucosa following such practices is a recognised complication. However mortality following foreign body perforation is reported as extremely rare in the medical literature. Surgical repair of rectal perforation and intensive treatment did not prevent development of acute respiratory distress syndrome (ARDS) and systemic inflammatory response syndrome (SIRS) hence leading to multiple organ dysfunction syndrome (MODS) and death.

This case report highlights the seriousness of rectal injuries following unusual sexual practices. Death in this case can be attributed to the late presentation and established faecal peritonitis. Death due to retroperitoneal perforation following such accidents have been reported in the literature. However previously no cases have been recorded where death occurred due to anterior rectal wall perforation.

We present here a case report of a 52-year-old man who had fatal rectal perforation following an injury with a vibrator. The incidence of rectal trauma by foreign body is increasing, although contemporary literature reveals that death in such cases is extremely rare. The fatal outcome in this case is attributed to the late presentation to hospital.

Case report

A 52-year-old man presented to the accident and emergency (A&E) department of our hospital at 04:00 am complaining of lower abdominal pain. He voluntarily admitted attending an erotic party 2 days previously and had indulged in anal sex with a mechanical vibrator. He developed gradual pain the following day. Initially the pain was constant and well localised to the lower abdomen. It progressively became more severe (requiring morphine) and generalised over the whole abdomen. He had also noted bleeding from his anus and had a single episode of vomiting.

On arrival he was in hypovolaemic shock with blood pressure of 69/47 mmHg, a pulse of 126 bpm, and a respiratory rate of 30 bpm. He was sweating but afebrile. On examination he had generalised abdominal tenderness with guarding and rebound tenderness. Bowel sounds were absent, however he had defaecated the previous day.

Digital rectal examination revealed severe tenderness in the pelvis along with some dark brown coloured matter on the examining finger. An erect chest X-ray revealed
gas under the diaphragm (Figure 1) thus confirming the perforation in the gut. Blood count, urea and electrolytes (U&E), serum amylase, and arterial blood gases were normal.

Figure 1. Erect chest X-ray at presentation demonstrates air under the diaphragm thus confirming perforated viscous

After initial resuscitation in A&E he underwent an exploratory laparotomy where he was found to have a perforation in the anterior wall of the upper third of the rectum. Other findings included an atonic dusky gut with staining and exudation on the small bowel and 2 litres of purulent fluid in the abdominal cavity. The perforation was repaired with interrupted 2/0 PDS sutures and a loop colostomy was done. The abdomen was thoroughly washed out with saline and closed en mass with 1/0 loop nylon.

Throughout surgery he had a raised CVP (central venous pressure) and persistent hypotension despite inotropic support. He was transferred ventilated to the intensive care unit (ICU) postoperatively. He developed acute respiratory distress syndrome (ARDS)—he was known to be a heavy smoker (Figure 2), central venous system (CVS) failure, persistent metabolic acidosis, worsening urea and creatinine, recurrent hypoglycaemia, and huge positive fluid balance.

Later he developed to multiple organ dysfunction syndrome (MODS) and systemic inflammatory response syndrome (SIRS) and died 2 days after surgery.
Discussion

Many adults engage in alternative methods of sexual stimulation and gratification such as anal eroticism.\textsuperscript{4} Foreign bodies inserted into the rectum with associated perforation have been well documented in medical literature. However, death following anterior rectal perforation (above the peritoneal reflection) has never previously been reported, although a single fatal outcome was noted in a case of the retroperitoneal rectal perforation.\textsuperscript{2}

The rectum above the pectinate line is generally insensitive to pain. Thus the perforation of the rectal wall may occur without the individual being aware of it at the time of the injury. Any such perforation can result in peritonitis due to release of faecal contents in the peritoneal cavity.

Four corrective approaches for colorectal perforation have been described:

- Simple repair and proximal diversion,
- Primary closure or resection and anastomosis of wound with exteriorisation,
- Formation of double-barrelled colostomy, and
- Hartmann’s procedure\textsuperscript{1}

In this case a simple repair was performed with proximal diversion and (under full antibiotic cover) inotropic and ventilatory support on intensive therapy unit (ITU). Despite these measures the patient failed to respond and developed systemic sepsis with MODS.
This case report highlights the dangers of anterior rectal perforation above the peritoneal reflection, with widespread faecal peritonitis complicated by late presentation to hospital.

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**References:**

Gallbladder perforation in a patient on steroid therapy
Syed Imran H Andrabi, Jawad Ahmad, Munir A Rathore, Ahmed A S El-Hakeem

Abstract
Gallbladder perforation is a serious clinical condition. A definitive diagnosis is contentious before surgery. We discuss a case where a young patient with Crohn’s disease taking oral steroids presented with an acute abdomen. CT scan demonstrated a perforated gallbladder without evidence of gallstones. The patient underwent an emergency cholecystectomy and peritoneal lavage. The history and clinical findings of this patient are reviewed to highlight perforation of the gallbladder in relation to steroid therapy.

Perforated gallbladder comprises of up to 2% cases of acute biliary emergencies,\(^1\) and poses a challenge due to a high morbidity and mortality. We present a young patient who developed biliary peritonitis requiring an emergency laparotomy and cholecystectomy for an acalculous and perforated gallbladder. He was on steroids for Crohn’s disease and we discuss the relation between steroid therapy and perforation of gallbladder.

Case report
A 34-year-old male, on oral prednisolone for small bowel Crohn’s disease, presented with a 3-day history of upper abdominal pain. On examination, his pulse was 90 beats per minute and temperature 37.8°C. His white cell count (WCC) was 12,200 mm\(^3\) (range 4000 to 11,000 mm\(^3\)) and C-reactive protein (CRP) was 38 (normal up to 10). On abdominal examination he had generalised tenderness and guarding but no rigidity. Abdominal and chest X-rays were unremarkable. A CT scan of the abdomen showed a small rent in the fundus of the gallbladder consistent with a perforation along with pericholecystic and free intraperitoneal fluid (Figure 1).

Figure 1. CT scan of abdomen with arrow pointing at the site of gallbladder perforation
The patient underwent an emergency laparotomy during which the findings of the CT scan were confirmed (Figure 2). A cholecystectomy and generous peritoneal wash out was performed. Histopathology attested a perforated gallbladder at the fundus.

Figure 2. Gallbladder with pointer passing through the perforation

Discussion
Steroid therapy has an effect on gallbladder function. It has been suggested that steroids impair function of smooth muscle of the gallbladder that may lead to chronic distension.\(^2\) Gallbladder hypomotility due to downregulating G\(_{i3}\) proteins caused by oral steroids has been demonstrated in animal models.\(^3\)

The fundus of the gallbladder is the least vascularised part of the organ,\(^4\) chronic distension due to impaired emptying coupled with poor vascularity may increase the susceptibility of the gallbladder fundus to perforation. Prolonged steroid therapy lowers the resistance of the biliary tree to bacterial invasiveness and suppresses the process of repair of a locally damaged gallbladder.\(^5\) Steroids also mask the clinical signs.

After a Medline search, we found only one case (reported by HJ Gonsalves) where perforation of an acalculous gallbladder was documented in a patient who was on prednisolone for rheumatoid arthritis.\(^5\)

It is notable in our case that WCC and CRP were elevated and the clinical signs were subtle. Ultrasound or a CT scan is helpful in these equivocal cases but the final diagnosis is often achieved only per-operatively.

Surgery is usually straightforward as there is minimal inflammatory response surrounding the gallbladder. Laparoscopy and proceed is suggested. A high index of suspicion and an open mind is the key in managing these patients.

Conclusion
Patients on steroid therapy are immunocompromised and the acute inflammatory response is impaired. Decreased gallbladder motility due to long term steroid use may
lead to chronic distension. The vicious combination of these phenomena makes this organ susceptible to perforation, even in the absence of stones.

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The challenge of paediatric obesity: more rhetoric than action

Bevan C Grant, Stan Bassin

Abstract

A growing body of knowledge clearly shows a rapid increase in the prevalence of childhood obesity. But in spite of the many empirically-driven research projects and more laissez-faire initiatives intent on finding ways to ensure the healthy development of our young people, translating what we know into appropriate behaviour in the home, school, and community is more difficult than it sounds. It is, therefore, not surprising this concern is attracting the attention of politicians, health professionals, and educators. This article reflects on the paediatric obesity research and argues for a more coordinated effort in addressing what could (but need not) become a major public health issue.

Paediatric obesity: its cause and increasing incidence

One of the benefits of living in a consumer-oriented society is having easy access to an endless variety of goods and services from which to live an advantaged lifestyle. There can, however, be a hidden personal and societal cost paid in morbidity and mortality. The ingenuity of new gadgets ensures life is more comfortable than ever before, and subsequently requires less expenditure of energy to satisfy our basic living needs.

In Western societies, machines, electronics, and other technological advances have supplanted virtually every physical activity that had been required by humans for daily living. Indeed, the tendency to minimise human energy expenditure is pervasive. Meanwhile, there is a never-ending array of easily available caloric-dense food products that stimulate and overwhelm our taste buds, although this is often referred to as the ‘less’ healthy option. This is spurred on by some sectors of the food industry that encourages caloric consumption beyond those required for daily living. So, in essence, it becomes easier to participate in a sedentary lifestyle accompanied by a high caloric diet.

Despite many children and their parents acknowledging the desirability of maintaining an energy balance through habitual physical activity and consuming lower caloric-dense healthier foods, this does not translate easily into desirable behaviour. Indeed, for many young people and their families, this potentially hazardous lifestyle offers a more convenient way of living. Is this desirable? NO. Is this easy to modify or eradicate? NO. Does the concern warrant more attention? YES.

The obesity epidemic was noted by The Royal College of Physicians when warning of the dire state of Britain’s health and, specifically, the rising tide of obesity—unless coordinated action is taken by Government, the food industries, the medical profession, and schools. Similar messages have also emerged from Professor Jim Mann and colleagues at the University of Otago, but is anyone listening?
As we move into the 21st century, there is a growing body of knowledge that clearly shows a rapid increase in the prevalence of chronic ‘lifestyle’ diseases, in particular childhood obesity. The government has recognised this situation is occurring in New Zealand and in 2006 announced a 4-year $67m campaign called Mission On. The campaign is aimed solely at improving the nutrition and increasing physical activity of people less than 24 years of age and is cross government sectors, school-based, as well as being community and family oriented.

When launching Mission On, Prime Minister Helen Clark said there is a need to improve nutrition intake and reverse the declining levels of physical activity. It was suggested that unless something changes in our living environment and the way we approach the modern lifestyle, it is possible the current generation of young New Zealanders may be the first generation to die younger than their parents. This contribution to the debate focuses on the increasing concern about the prevalence of overweight and obesity in children, and considers whether schools and the medical community have a role as partners in developing strategies in addressing what is essentially a public health issue.

In 2003, the World Health Organization (WHO) estimated that more than 1 billion adults and 17.6 million children are overweight, and the numbers are increasing. Furthermore, over 3000 New Zealanders died between 1996 and 1998 from complications resulting from having a high body mass index (BMI).

The majority of people who are overweight are a consequence of an obesogenic (obesity-promoting) environment that encourages behaviours that ultimately contribute to obesity. New Zealand is experiencing what some refer to as a problem with paediatric obesity. The Ministry of Health suggests that the obesity levels amongst New Zealand children are high, similar to other countries, with estimates varying between 20% and 30%. However, being more specific about the prevalence of paediatric obesity is complicated. Indeed, the controversy surrounding how this condition is determined—and the variation in body size across different ages, socioeconomic status, and ethnic groups—presents diagnostic, intervention, and research challenges.

Many ‘experts’ have called for immediate action with regards to the increasing numbers of young people who are overweight and the high persistence of obesity into adulthood. If the concern is not addressed, the consequences could impact on an individual’s quality of life and the monetary costs for society to treat people with obesity-related illnesses.

In the United States, for example, the cost of diagnostic, preventative, and treatment-related healthcare services, plus indirect costs from income lost because of missed work due to illness and disability related to obesity, was estimated to be US$117 billion in 2000.

One could speculate that the same story might be told in New Zealand although with a proportional price tag. As mentioned by New Zealand surgeons, “…we can’t afford any more obese children. We can’t deal with the ones we’ve got at the moment”. In spite of this rather emotive plea, there is a need for a better understanding of the problem to reduce the burden on the health system. But more importantly, there is a need to find ways that ensure the healthy development of our young people.
Over the past 20 years there has been a glut of clinical-based research on obesity-related health problems. For example, overweight youth may have an elevated risk of developing asthma—and obesity is often associated with a reduction in deep breathing, narrowing of airways, shortness of breath, and increased wheezing.

Another health-related problem positively correlated with excessive weight is an increase in the incidence of Type 2 diabetes in young people. In fact it is possible that that within the next 10 years more children will have Type 2 diabetes than Type 1 diabetes. Of youth diagnosed with diabetes in the United States, 29% have Type 2 and many overweight youth are exhibiting pre-diabetic symptoms without fully developing diabetes. The juvenile pre-diabetic symptoms (including abdominal obesity, high blood pressure, insulin insensitivity, and impaired glucose tolerance) are part of the development of a metabolic syndrome often linked to insulin resistance and an elevated risk of heart disease, diabetes, or stroke.

Excess weight is also believed to promote the development of hypertension, diabetes, sleep apnoea and elevated lipids, all factors related to cardiovascular disease (CVD). It can also cause insulin resistance with consequent hyperinsulinaemia and elevated insulin levels seemed to be linked to increased inflammatory factors of vascular disease, although this point is controversial. However, what is not contested are the numbers of children who are developing diabetes and metabolic syndrome at ever-younger ages ultimately leading to a group of younger adults with CVD.

In the United States, a sizeable number of overweight youth are currently diagnosed with metabolic syndrome. Some consider this to be caused by the effect on target organs of biochemical factors secreted or regulated by visceral fat. The criteria for determining metabolic syndrome in adolescents have been adapted from the American National Cholesterol Education Programme. It usually requires the identification of at least three of the following symptoms: a BMI (Body Mass Index—weight in kilograms divided by height in metres squared) based on age and gender in the 95th percentile or higher; elevated triglycerides; low high-density lipoprotein (HDL) cholesterol; hypertension; and impaired glucose metabolism. The syndrome emerges because of our metabolic mechanism to store and defend the fat depot when energy intake is high relative to expenditure of energy.

The anticipated switch in energy balance (i.e. food scarcity and increased energy expenditure associated with thermoregulation, migration, or foraging) never materialises for many of today’s children and teenagers. Lacking sufficient exercise, obesity worsens, derangements in hormonal regulation of growth and energy metabolism are exacerbated, and insulin resistance increases.

Genetically-susceptible children, adolescents, and adults’ pancreatic insulin responses become inadequate and some form of diabetes ensues. The severity of insulin resistance is elevated by obesity. As a result, the prevalence of metabolic syndrome in American youth has risen from 910,000 to nearly 2 million, in less than a decade.

Moreover, approximately 3 million, or 11% of American teens have impaired glucose tolerance. While metabolic syndrome is very concerning, perhaps the greatest health consequence of paediatric obesity is an estimated 75% of obese youth will remain obese as adults.
This could mean that even if adverse health affects are not experienced as part of being overweight in youth it is probable that some of these previously mentioned medical conditions will emerge later in life.

Critics of the claim that there is a paediatric obesity crisis argue the use of the term crisis is a result of society’s tendency to sensationalise health issues, particularly those concerning children. This also reinforces a stigma that overweight youth often attach to themselves, which, critics argue, contributes to the problem. There is also a need to better define the terms obese and overweight that are often used interchangeably.

The mechanism most commonly used for identifying obesity is BMI. Although useful, this method of assessment is not a gold standard for measuring fatness or obesity, particularly with children. It ignores the high proportion of the variance between subjects and does not take into account other important factors such as physique, developmental stage, lifestyle, or family history. Nor does it account for very physically active children with large muscles who are overweight but still active on a regular basis.

Despite some of these flaws, researchers and health professionals are attracted by the simplicity of the BMI index, so it remains the most commonly used screening device for identifying overweight and obese children in research studies. One advantage of using BMI is that larger numbers of children can be screened and included in studies. Because its simplicity provides an easy (although not highly reliable) cross-study and clinical comparison, it should be used with caution as a diagnostic measurement. This particularly applies when determining global and national trends, developing gender-specific age-for-weight percentiles as well as tracking individual progress via aerobic capacity or circumference measurements with various interventions.

Although central adiposity (i.e. waist circumference) is a sensitive measure for determining the risk factors of metabolic syndrome, it is important to develop standard uniform measures of obesity that are easily understood by the public. Such information could also be used in a public health campaign.

As predicted by global trends, the distribution of obesity varies with ethnic and socioeconomic factors. It is expected that a greater proportion of children from more deprived communities in Western society will be overweight, as compared to their privileged peers. Living in disadvantaged environments can discourage young people from participating in outdoor physical activities outside of school time. But irrespective of living locale, many young people are experiencing decreasing levels of incidental physical activity thus lowering energy expenditure.

For example, increasing numbers of children are being driven to school and spend their after-school hours on the computer or in front of the television. This by itself, however, is not always a reliable indicator of levels of physical activity or health status.

For many children, being overweight is sometimes interpreted as being lazy and a sign of self neglect. In addition to self-consciousness, this can result in a lack of enthusiasm to voluntarily participate in physical activity. However, this is a complex phenomenon to unravel, and it is argued that the psychosocial effects typically associated with obesity can be both a cause as well as a result of obesity.
To address the decline in levels of physical activity, young people need to see the opportunities to engage in a variety of both structured (e.g. sport) and unstructured (e.g. playgrounds) exercise as inviting and attractive.

The increasing levels of (and consequences associated with) paediatric obesity have attracted the attention of governments throughout the Western world as well as a variety of health groups. Some critics are intent on defending institutions, like the teaching of health and physical education in schools against being seen as the solution to the obesity epidemic. Their cause is justified for we need to look both at and beyond the school to ensure all children have access to a healthy lifestyle.

If educators and health professionals together work towards better understanding and reducing this problem, then there is a chance to contribute to the overall wellbeing of the individual and community. However, if no action is taken, many of today’s young people may become a liability to society and themselves because of the negative consequences they might suffer as a result of their body weight.

Where to from here?

Over the past decade there have been numerous debates about the proportion of the younger population who are considered to be ‘overweight’ but as the conversations continue, the problem steadily worsens. Furthermore, there seems to be no easy short-term solution to what is a complex situation. Thus it is time to turn the rhetoric into action. But where does the responsibility lie and who is in a position to influence behaviour, identify, and/or screen for the potential onset of what has been described as a chronic condition in many young people?

"The epidemic of overweight and obesity in children and adults in this country provides the most obvious evidence that simple education messages are insufficient," says Professor Jim Mann, Director of the WHO Collaborating Centre for Human Nutrition, University of Otago.

What role, if any, should government, the food industry, various health professions, and/or schools play in addressing this worsening scenario? Beyond advocating for legislative controls on such things as the marketing and sale of some foods and drinks, the international health community calls for schools to take a much more active role in helping fight paediatric obesity. Indeed, when children are mentioned in the obesity-crisis discourse, schools (particularly particular health and physical education) are sometimes seen as a possible solution to the problem.

However, while results from the plethora of school-based studies usually report some positive short-term health outcomes, the worsening statistics of obesity suggest that the schools’ efforts have limited long-term success on modifying health related behaviour.

In many countries, including New Zealand, there has been a call for more time be devoted to physical activity and learning about good nutrition practices. Although the intention may seem like a logical way to address discerning patterns of the increasing numbers of children who are overweight, it assumes teachers have both the knowledge and expertise to take on such a responsibility. Even if they were able to fulfil such a role, there is an assumption all children will become confident, competent, and comfortable with and in control of their bodies.
The reality, however, is that schools by themselves cannot prevent the rise of obesity, particularly in a consumer society that expects young people to simultaneously consume and abstain with respect to numerous lifestyle choices. Furthermore, a young person’s lifestyle is complicated by the many conflicting and contradictory messages received within and beyond school, as well as from friends and family.

Recently there has been a call for a more integrated and comprehensive community-wide approach in addressing what is often labelled as a health risk. This recognises it is the environmental determinants rather than genetics that have changed. There are no validated instruments available at present for assessing the obesogenic state of the New Zealand school environments. Nevertheless, there are numerous school-based efforts attempting to modify what occurs in schools (e.g. Project Energize in Waikato) as well as a number of national initiatives (e.g. Health Promoting Schools, Active Schools) aimed at improving the health of young people.

In spite of a crowded timetable, it is evident that schools are under pressure to take responsibility for the health of young people while maintaining academic excellence. Reasons for this include the fact that children are a “captured market” and schools are well placed to work in conjunction with the public and private sector.

Before launching into any large-scale preventive campaigns, we need to remember that ameliorating a major health issue is not just the role of the school. Nor can this concern be solved by the implementation of a simple cause and effect model where teachers are seen as the front line soldiers with little say in the strategies and tactics of engagement.

As John Evans, a leading physical education researcher, recently stated: “…if nothing else, we need a fundamental critique of any discourse that reduces the practice of education to the trivium of diet, exercise and weight, or generates social practices in which the child is reduced to a ‘body’ rather than a person whose circumstances need to be understood if the health and educational requirements are to be met.”

In 2006 the New Zealand Government appointed a Committee for the purpose of conducting an Inquiry into Obesity and Type 2 Diabetes. A submission from Physical Education New Zealand encouraged the scientific community and policymakers to rethink ways of addressing the ‘problem’.

While the benefits of a healthy lifestyle have been widely published, and the New Zealand Healthy Eating, Healthy Action statement is intended to form the basis of government policy to reduce the risk of chronic diseases, Professor Mann is adamant that “much remains to be done to ensure that the knowledge is translated into action”. Amongst other matters, this means recognising young people are vulnerable to forces more powerful than school policies, and the school health and physical education curriculum.

Schools may be an ideal place to educate for behaviour change but we need to learn from the past and move beyond what have been primarily prescriptive practices where the body is treated as an object. Furthermore, it is imperative that any future endeavours aimed at addressing health-related policies and practices within and outside school engage alternative strategies and involve a range of organisations.

As noted in a lead article in a 2006 December issue of the New Zealand Listener, there is a potential crisis looming and the time has come for making a bold move.
Irrespective of who initiates the move, any long-term effect will require a more committed and coordinated effort, as well as effective use of resources than in the past.

Surely this is not too much to ask—as the potential human and economic costs emerging from a not-so-healthy lifestyle are daunting. Indeed, decisive action is necessary as the consequences of failing to act more insightfully are dire.

Competing interests: None.

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EDITORIAL

This being the last number of our Journal for the year 1907, it is a good time to review and discuss our position. That, as a body, we are steadily gaining in strength, power and influence, there can be no question. As members of the British Medical Association we have a feeling that we share the prestige and influence of that great organisation, and we would no more think of breaking our connection with the parent body, than as member of the Dominion of New Zealand we would dream of cutting the tie that binds us to the Old Country. Still this very connection has its disadvantages and a frank statement of them may lead to some useful suggestions.

On considering the question, the first fact to command attention is this;—There are some 800 odd medical practitioners in New Zealand and only about 300 members of the New Zealand Branch of the B.M.A. and this, although in the large towns almost all are members.

It is quite evident therefore that the bulk of the country doctors are not members of the Association; the problem is how to get these to join; there is no doubt the town member gets much more for his subscription than the country member; he has the monthly meetings and he is, through the Association, kept in touch with all that goes on; the question is can the country members’ subscription be reduced? It might perhaps a little, but very little, for of the whole subscription, far the greater part goes home to the parent body to pay for the Journal, the remainder is nearly all required to pay for our own Journal.

Suppose they were asked 6/- or even 10/- less would that tempt them? It is very doubtful. A more certain way is by letting them feel that they can, though not present at the large monthly meetings in the centre, still keep in touch with all that is going on through the medium of their journal which we feel could be made more attractive and interesting, if instead of being filled with papers and descriptions of cases, it was really used by members as the channel through which an interchange of views could take place; we ask especially for suggestions as to how the 500 non-members can be got to join and enjoy the benefit of the Association.

There are many matters of vital importance to the profession which are well worth discussing and for which the pages of our Journal are always open, and letters to the Editor will always be gladly received. Then again the larger country centres, without forming regular divisions, might appoint someone as a secretary and have occasional meetings, say once a quarter, to discuss such questions as the Friendly Societies, the Accident Insurance laws, the scale of fees and so on, and forward their opinions to the nearest Division, where it would always carry great weight. There is a feeling amongst some of our country members, doubtless held still more strongly by many country doctors who are not members, that a few men at headquarters take too much
upon themselves and wish to legislate for everyone without consulting the wishes of those whose freedom of action they seek to limit.

Now we wish to point out that this is not so; the members of the Council for instance have certain duties thrust upon them, as the only duly constituted body elected by the Branch as a whole, they have to act for and on behalf of the Branch: often they would be only too glad to shirk the responsibility; but someone has to do it. Take the question of the Friendly Societies; the Council have taken upon themselves the task of trying to bring into some sort of order the present chaotic relations between Friendly Societies and doctors.

To get the opinions of as many men as possible each division has been asked to report the views of its members; where there has been any difference, these differences have been explained and in every important detail, by one or other division giving way a little, these differences have been eliminated, till now a common ground has been arrived at and all the divisions are in accordance as far as the town members go but what are the views of the country members? They have been asked to express the min writing in the shape of letters to the editor, but the response has been very small and in most cases has shown that the writers do not fully grasp the difficulties of the position.

And what about the 500 doctors who are not members of the B.M.A.? There is no doubt but that the effort now being made will result in lodge surgeons getting much better terms than they have at present, if the doctors will everywhere co-operate, but if one says, ‘I won’t agree to the new scheme because I have not been consulted’; another, ‘I won’t agree because my particular grievance has not been removed’ and so on, then nothing will come of it; on the other hand, if each one will recognise that it is impossible to get each man’s views agreed to by all the Friendly Societies that an honest attempt has been made to get fairer terms for the Lodge Surgeons, while not asking for things which it is impossible for the Friendly Societies to concede, then lasting good may be done, and the Lodge Surgeon’s position will be enormously improved.

Moreover if country members and those who are not members yet, but who, we hope, soon will be, will look at the proposed new Lodge Agreement they will see that town members are not legislating for country ones, on any points where town and country differ; on such points as scale of fees, age limit, mileage and many others it has been left for both town and country to settle these matters by arbitration in each district; on such points as apply alike to town and country such as the wage limit, on such points alone has a definite decision been come to.

Never before have doctors been so much in the public eye as during the last year; the growing importance of the Health Department, the talk about Infant Life Protection, the legislation against Quacks and Patent Medicines the prevalence of Influenza, of Appendicitis, all these have contributed to bring the medical profession very much before the public, and while unquestionably this is for our own good, it makes it all the more necessary for us to act carefully and to act together; if we work one against the other and not for the common good of all, then good-bye to any hopes of improving our condition.
An unusual cause of shoulder pain: self-assessment questions

Bhavuk Garg, Vijay Sharma, Shah Alam Khan, Rajesh Malhotra

The patient, a 31-year-old male, presented for orthopaedic evaluation for persistent pain in his right shoulder for about 1 year. He had been seen by his family physician, who advised local application of heat therapy and analgesics, but his pain and swelling persisted. The patient also complained of stiffness in his shoulder.

On physical examination, the patient’s right shoulder lacked full range of motion. Abduction was approximately 35 degrees short of full. Flexion was to approximately 90 degrees. There was a mild effusion with no local rise in temperature. There were no specific areas of tenderness although some hard bony nodules could be felt in acromial region. No instability was noted during the exam.

Anteroposterior radiograph of the patient’s right shoulder was taken (Figure 1).

Questions:

What is the diagnosis and differential diagnosis?
What are the other sites of involvement?
What is the treatment and prognosis?
Answers:

What is the diagnosis and differential diagnosis?

Answer: The X-ray of patient’s right shoulder shows multiple radiopaque round or oval loose bodies within the joint. The differential diagnoses are synovial chondromatosis, tumoral calcinosis, hypervitaminosis D, pigmented villonodular synovitis, and synovial sarcoma.

Clinical and imaging studies are sufficient to make a diagnosis of synovial chondromatosis. In advanced cases, other radiologic signs such as degenerative arthritis, osteophytes and subchondral sclerosis may be present. In rare and doubtful cases, histopathologic studies are conclusive.

What are the other sites of involvement?

Answer: Synovial chondromatosis is a rare benign condition that involves the synovial lining of joints, bursae, or tendon sheaths. It is a synovial proliferative disease which is characterised by the cartilaginous or osteocartilaginous metaplasia of the synovial membrane, resulting in the formation of multiple intra-articular cartilaginous or osseous bodies. It is a monoarticular condition. Joints are the most commonly affected—in order of frequency: knee, elbow, shoulder, and hip. It has also been reported in the temporomandibular joint.

This self-limited and non-aggressive condition presents during the third to fifth decade, twice as often in men than women and it does not occur in children. It very rarely degenerates into a malignant condition. Secondary synovial chondromatosis may be present after long standing osteoarthritis.

What is the treatment and prognosis?

Answer: Treatment of synovial chondromatosis is controversial. Options include arthroscopic synovectomy, open synovectomy, and loose body removal. Pain and other symptoms are relieved by evacuation of the loose bodies. With the advent of arthroscopy this has become a relatively easy and less invasive of a procedure. Joints, other than the knee, may still lend themselves to arthrotomy and exploration. Total open synovectomy is the treatment of choice. Recurrence rate is over 25%.

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Rosiglitazone—continued uncertainty about safety

This drug is a thiazolidinedione and is currently being used to treat type 2 diabetes. It is particularly useful when for one reason or another an alternative oral diabetes therapy (metformin or a sulfonylurea) has failed. It is not readily available in New Zealand but the related pioglitazone can be used in appropriate circumstances.

The shadow of cardiac complications looms over the glitazones and a recent trial assesses this point. The interim findings are inconclusive. It is associated with an increased risk of heart failure but the relationship to myocardial infarction is uncertain. This paper is complemented by three editorials. The issue is summarised by one of these—“patients and physicians will need to weigh the benefits and risks of treatment with rosiglitazone.”

On the one side—better glycaemic control, and on the other—possible cardiac complications.


The benefit of dietary sodium reduction on cardiovascular outcomes

Evidence from observational and randomised trials shows that reduced sodium intake lowers blood pressure and can prevent hypertension. In a recent study the possibility that there may be a more general cardiovascular benefit from a lowered salt diet is considered. The researchers have done this by assessing the cardiovascular health of some 3000 or more subjects who participated in randomised trials involving dietary sodium reduction 10–15 years previously. And, as they expected, it proved beneficial—to the tune of a 30% reduction in cardiovascular events over the 10–15 years.

These results were enthusiastically endorsed in an accompanying editorial, but not by Paul P Glasziou, professor of evidence based medicine at Oxford University. He feels that the dietary instruction and counselling in the original studies were inadequate and probably impractical in primary care.


Can corticosteroids prevent laryngeal oedema after prolonged intubation?

Tracheal intubation for respiratory support is part of the routine acute care provided to critically ill patients, but can lead to substantial morbidity. Apparently laryngeal oedema is common after extubation in those who have been intubated for >36 hours. In this multicentre randomised trial from France the trialists explored the possibility that methylprednisolone started 12 h before a planned extubation could prevent postextubation laryngeal oedema.
Half of 761 adult intensive care patients received intravenous methylprednisone 12 hours before and at 4 hourly intervals until extubation. The steroid treated patients had less laryngeal oedema than the placebo cohort (3% vs 22%, p<0.0001). Sounds good. Lancet 2007;369:1083–9

Blood loss after total knee replacement

Total knee replacement (TKR) may result in blood loss ranging from 800 ml to 1800 ml. Pharmacological measures which have been proven to reduce blood loss after TKR include topically applied fibrin sprays and the intravenous administration of tranexamic acid.

A placebo controlled trial comparing these techniques shows that both are significantly better than placebo. As both therapeutic groups has almost equal benefit, the triallists recommend tranexamic acid as it is very much cheaper—£4 per patient vs £380 for the fibrin spray.

Blood transfusion rates in the treated patients were approximately halved. One wonders what fibrin spray and tranexamic acid combined might achieve? J Bone Joint Surg (Br) 2007;89-B:306–9

More about the weekend in hospital (in the USA)

We have recently (NZMJ 15/6/2007) abstracted a paper that suggested that the mortality rate of patients with myocardial infarction was higher in those admitted at the weekend. But what about surgical cases? In this study nearly 5,000,000 case records were audited and the findings were that the rates of complications are higher on weekends that on weekdays for some surgical and newborn complications. The main surgical complication that occurred more frequently on weekends was postoperative haemorrhage. There was a significant increase in the weekend complications (odds ratio 1.46) in patients undergoing vascular procedures. Obstetric trauma with caesarean sections occurred 36% more frequently on weekends (p<0.01). On the other hand, complications related to anaesthesia occurred less frequently on weekends (OR 0.86).

The American Journal of Medicine 2007;120:422–8
PHARMAC responds on Herceptin assumptions and decisions

We welcome the comments of Drs Richard Isaacs, Chris Frampton, and Marion Kuper-Hommel about the funding in New Zealand of adjuvant trastuzumab (Herceptin) for HER2-positive early breast cancer. PHARMAC considers that, in terms of its decision criteria, the available evidence for 9-weeks therapy, given concurrently with taxanes, offers sufficient clinical benefits to justify its funding, relative to other choices.

PHARMAC has weighed up the available evidence, together with the wider and longer-term health care costs, in a logical, systematic, and transparent fashion. This has included accounting for the results of the larger trials, fully and in their entirety, with aspects of study quality beyond size and missing data.

FinHer was a good trial giving adequate information to inform a concurrent 9-week funding decision. The evidence for longer duration regimens from the larger trials is hampered by good evidence of significant and appreciable waning (suggesting poor durability) and the non-publication of ostensibly good and highly relevant trial data from nearly 1000 participants. These missing data may confirm that sequential 12-month treatment is much less efficacious than concurrent and than previously thought, as was seen in their interim presentation, and either way the data are important and need to be published.

Responses to the correspondents’ specific points are in Table 1 below. Much of their arguments were already discussed in detail in the appendices (see links below) to the PHARMAC article itself, which inter alia described in some depth the survival with HER2-positive early breast cancer, epidemiology, and ethnic/regional disparities, and clinical effectiveness including publication bias.

The emerging evidence will feed into debates internationally about the optimal use of trastuzumab. The optimal ‘standard of care’ is uncertain. Uncertainty around sequencing and duration is a real issue and urgently needs to be addressed. There needs to be full publication of all trial data around sequential treatment, formal analysis of its durability, and proper trial evidence to confirm optimal duration of treatment.

PHARMAC is supporting the SOLD trial internationally to help resolve the duration question. Whilst awaiting these comparative data, PHARMAC has taken the proactive pragmatic approach of funding the concurrent 9-week regimen that is considered cost-effective—rather than funding nothing, as currently the sequential 12-month regimen is not considered cost-effective and is unjustifiable under PHARMAC’s nine decision criteria.

Once again, we appreciate the open debate of the issues in the peer-reviewed setting, as discussion of all of the evidence and its analysis is critical to understanding the quality of PHARMAC’s decisions.
Conflict of interest: PHARMAC is currently the subject of a Judicial Review of its decisions to fund a concurrent 9-week regimen of trastuzumab as adjunctive treatment of HER2-positive early breast cancer and not to fund a sequential 12-month regimen at this stage.

Scott Metcalfe  
Chief Advisor Population Medicine

Jackie Evans  
Therapeutic Group Manager

PHARMAC, Wellington

Table 1. Specific concerns and PHARMAC responses

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| Large patient numbers in trials of longer duration treatment, vs. two small studies for shorter duration | As covered in PHARMAC’s article, major doubts persist as to optimal treatment sequencing and duration. It is incorrect to combine all of the 12-month studies together, especially given head-to-head RCT evidence of significant differences in efficacy and side effects according to sequence; given such logic, it would be equally appropriate to compare all concurrent treatments, including the FinHer regimen, against sequential regimens.

Trials of the 12-month sequential regimen, the regimen for which funding was sought, covered 5,365 patients, demonstrating a 30% relative reduction in disease events (HR 0.70, 95% CI 0.61-0.81). These patients comprised 3,401 women in the 12-month trastuzumab and standard care arms of HERA and 1,964 women (2/3rds as many) in the 12-month sequential trastuzumab and standard care arms of trial NCCTG-N9831—a comparison whose publication is still awaited.

FinHer’s power and efficacy | Our stance on the statistical power of the FinHer trial remains unchanged, described on pages 28-30 of Appendix 4 ([http://www.nzma.org.nz/journal/120-1256/2593/Afour.pdf](http://www.nzma.org.nz/journal/120-1256/2593/Afour.pdf)). This includes (but is not restricted to) FinHer’s results being statistically significant despite its smaller size. As few as 145 patients would have been needed for the results to still be statistically significant.

Large treatment effects—likely to be more clinically worthwhile—but with wider confidence intervals (greater imprecision) should not be ignored essentially because of less power. Such concerns are analogous to post-hoc power calculations—where in fact once results are available, a trial yields a treatment effect and confidence interval for the results, and the power of the trial is expressed in that confidence interval; hence ‘power’ is no longer a meaningful concern.

Although patent the results of FinHer are numerically less precise than those of HERA or the other large studies, the DFS results were statistically significant at the p=0.01 level, in other words the odds are 99 times out of 100 that improvement in DFS in FinHer would not be attributable to chance alone, and many treatments are funded with a lesser degree of certainty. RCT data from 208 patients (TAnDEM) were sufficient for the EMEA to license the use of trastuzumab with aromatase inhibitors in metastatic disease.

Compared with sequential 12-month treatment (updated HERA data and the sequential arm of trial N9831), at the very worst—i.e. the minimum extent that disease recurrence can confidently be expected to reduce, using upper confidence limits for hazard ratios—the FinHer results were as effective as sequential regimens (17% and 19% minimum relative hazard reductions respectively), even with its smaller number of patients.
Table 1. Specific concerns and PHARMAC responses (continued)

| Only 54 FinHer patients used trastuzumab and docetaxel | Interestingly, the 54 patients in FinHer using trastuzumab with docetaxel still showed significant improvements in disease-free survival (DFS) compared with those using docetaxel alone, despite low numbers. Such comparison is duly caveated in Appendix 4; these caveats however extend to the correspondents’ restricting analysis to docetaxel patients alone. Using the correspondents’ logic would require restricting HERA data analysis interpretation to its 889 patients who received ‘standard of care’ anthracycline and taxanes, where DFS effects were reduced and not statistically significant (HR 0.80 (0.59–1.10)). We are not seriously advocating this post-hoc approach, but neither should the FinHer data be so separated. |
| Standard regimens in the trials | Chemotherapy regimens in FinHer were no less standard than the regimens in other trials. A similar docetaxel regimen to FinHer was also used in BCIRG 006; the NSABP B31 and NCCTG N9831 trials (Romond 2005) used paclitaxel. |
| Receipt of protocol chemotherapy in FinHer | Other trials (the basis for continuing calls for longer duration treatment) had similar issues with patients not receiving full-dose or protocol-specified therapy. In the HERA trial chemotherapy was not specified, therefore there was large variation in the regimens and doses used, and only 26% of patient received taxanes and 6% received no anthracyclines at all; doses of docetaxel in HERA (11%) were not described. |
| Methodological flaws in longer duration trials, and the balance of the FinHer trial arms | The other studies have yet to describe rates of patients reducing their docetaxel doses (or indeed other chemotherapy drugs) as a result of adverse effects. |
| Discussion of overall survival | In Appendix 4 (pages 30–31) we discussed in some detail the issues around overall survival for the short duration and long duration regimes. We invite wide readership of this material. |

FinHer’s non-significant overall survival (OS) results to date, well-acknowledged, probably result from the combination of the small sample size and short follow-up at the time of analysis; significant improvements in OS may become evident in the final 5-year median follow-up analysis of FinHer expected later this year. This mirrors that of the sequential 12-month treatment, where the initial lack of overall survival benefit with the HERA study did not prevent widespread calls for its funding—via linkage to the significant OS results for concurrent regimens. Whilst HERA does now show significance in OS, there still remain serious questions about the efficacy and durability of sequential trastuzumab.
Table 1. Specific concerns and PHARMAC responses (continued)

| ECOG-2198 | Our article and Appendix 4 went to some pains to note that trial ECOG-E2198 (comparing shorter- with longer-duration trastuzumab regimens) was a pilot study and we excluded it from further analysis. It simply supports the concept of efficacy with shorter, concurrent, treatment. |
| HERA’s waning of effect | The point with the waning of DFS benefit with longer-term follow-up with the HERA study is that it questions how durable sequential treatment really is—where the implication has been, unquestioned, that short-term benefits will last. This brings doubt on the sequential 12-month regimen advocated, particularly when other important data have not been published and are therefore out of mind—data that cast further doubt on the extent of the effectiveness of sequential 12-month treatment. This latter point needs to be acknowledged more widely.  
As noted in the article and in Appendix 4 (pages 16-17), contamination, being the cross-over of patients in HERA to the control arm, seemed to have little influence—the opportunity to cross-over occurred relatively late, and the DFS hazard ratios for both intention-to-treat and censored analyses were identical. This concordance of hazard ratios suggests a genuine waning of effect, not a crossover artefact as argued by the correspondents.  
By contrast, FinHer’s central effects estimates were maintained at three years, similar to patterns seen with other concurrent regimens. |
| International view of the ethics of continuing studies when controls are without 12 months treatment | The correspondents’ claimed international view on the ethics of control groups without 12 months trastuzumab is un referenced and its universality needs to be verified.  
We also wonder whether any such an international view, if confirmed, will change, at least for sequential treatment, as other countries grapple with the implications of the non-publication to date of the NCCTG-N9831 Arm B (sequential) data. |
| CaTSoP’s role and recommendations | CaTSoP is one of 12 specialist subcommittees to PTAC, advising PTAC which in turn gives free and frank advice to PHARMAC. The subcommittee structure provides clinical evaluations in specialist areas; PTAC puts specific questions to subcommittees relating to actual clinical practice and real-world issues in their specialty areas. Subcommittees are subordinate to PTAC, providing information necessary for PTAC’s work but that is insufficient in itself.  
CaTSoP itself in April 2006 gave the sequential 12-month treatment only a low/medium priority, highlighting problems such as resource constraints, opportunity costs, and long-term uncertainty. This recommendation was from oncologists for what had been heavily promoted as an exciting and important “wonder drug”. Based on this advice from CaTSoP and its own assessment of other information, PTAC in August 2006 recommended the sequential 12-month sequential regimen be declined. So in October 2006, CaTSoP was being asked to consider concurrent 9 weeks in isolation, without recourse to sequential 12-month treatment. CaTSoP’s minute for that meeting noted the following: ‘At its 17 August 2006 meeting PTAC recommended that the application for the funding of trastuzumab as per the HERA protocol (12-months treatment) be declined and that the application be referred back to the Cancer Treatment Subcommittee of PTAC to consider the clinical appropriateness of any funding regimen consistent with the FinHer protocol (9-weeks treatment)’.  
CaTSoP could have said it was not clinically appropriate to fund concurrent 9 weeks, but did not. The subcommittee instead recommended that, in the absence of availability of funding for sequential 12 months treatment, concurrent 9-weeks treatment would be reasonable and gave this recommendation a high priority. However, CaTSoP noted, and wished to emphasise, that this recommendation was strongly based on financial considerations since the subcommittee had more confidence in the validity of the 12-month treatment results.  
See Appendix 1 (accessible at for a copy of the full minutes for CaTSoP’s April and October 2006 meetings relevant to trastuzumab in early breast cancer. |
Table 1. Specific concerns and PHARMAC responses (continued)

| PHARMAC’s budget | PHARMAC’s role is to work with the DHBs and determine how to allocate the funding the DHBs are supplied between pharmaceutical spending and other spending. There are many competing options, and in this case the levels and certainty of health benefits with the 12-month regimen were modest compared with the magnitude of funding, resource implications and opportunity costs ([http://www.pharmac.govt.nz/pdf/030307c.pdf](http://www.pharmac.govt.nz/pdf/030307c.pdf)) so that it did not amount to a good funding choice. Wider issues of funding and budget setting are currently undergoing review as part of the government’s review of its Medicines Strategy ([http://www.moh.govt.nz/moh.nsf/pagesmh/5633/$File/towards-newzealand-medicines-strategy-consult.doc](http://www.moh.govt.nz/moh.nsf/pagesmh/5633/$File/towards-newzealand-medicines-strategy-consult.doc)). |
| Adoption of expensive new treatments | The quality of care is not an automatic given with the uptake of new therapies. The report cited by the correspondents (Jönsson & Wilking 2007), paid for by Roche\textsuperscript{15,16}, has been criticised on a number of grounds\textsuperscript{15,17}, including: |
| Price and negotiation with suppliers | Negotiation with suppliers is a key feature of most PHARMAC funding decisions. While price is clearly important, PHARMAC is ultimately most interested in the value of funding decisions (population health gains, etc, not just the price). Decisions involve inseparable clinical and funding imperatives, and trastuzumab has been no different. While understanding suppliers’ commercial drivers, PHARMAC is always, in effect through its negotiation and other purchasing strategies, scrutinising pricing policies by incentivising suppliers to offer attractive funding proposals. Some commentators have also argued that suppliers should be more accountable to the public about why some medicines are priced at the level they are. In this wider context, Richard Peto, for example has been quoted “Patient organisations may call for all effective treatment to be available for free, but if this was the case it would be exploited wholly by drug companies for corporate profit—they would double their prices overnight. The price rise in drugs has been unprecedented and is made more acceptable by reports like these. There is too much criticism of the NHS and not enough of these companies’ pricing policies.”\textsuperscript{15} |

- New and expensive cancer drugs might not be any more effective than therapies already in use. In terms of value-for-money, one reason a drug may not be recommended is that it isn’t sufficiently better than other drugs already available to make it cost effective.\textsuperscript{15}

- Population-based, comparative survival studies have known limitations\textsuperscript{18}, and the ranking of countries according to survival with cancer may be flawed.\textsuperscript{19} Reporting biases, which will understate cancer-ascribed mortality rates in some countries, result in other countries such as the UK (and NZ) having over-stated high comparative mortality rates. This is where not all countries are able to link into national mortality statistics and automatically be notified of cancer-related deaths.\textsuperscript{15}

- The report relates the availability of cancer drugs in 38 countries in Europe in 2000 with the 5-year survival of patients diagnosed in those countries during 1990-94, some 6-10 years earlier. For 12 of the 38 countries involved, no such survival data are said to actually exist.\textsuperscript{20}

- For most cancers, higher survival is considered to result from earlier diagnosis and a combination of expert surgery and/or radiotherapy, as well as from the use of cancer drugs.\textsuperscript{16} ‘Huge decreases’ in cancer mortality in the UK have been considered to be largely due to a downturn in deaths caused by tobacco, and dramatically improved breast cancer survival rates, mostly attributed to the success of hormone therapies.\textsuperscript{15}
Appendices to Metcalfe et al NZMJ 15 June 2007:

- Appendix 1: HER2 positive breast cancer, its treatment and prognosis (including survival) [http://www.nzma.org.nz/journal/120-1256/2593/Aone.pdf]
- Appendix 4: Clinical effectiveness (including publication bias) [http://www.nzma.org.nz/journal/120-1256/2593/Afour.pdf]

References:

10. PHARMAC decision criteria at [http://www.pharmac.govt.nz/pharmaceutical_schedule_update.asp]


A tough market

People advocating on behalf of consumers like to take aim at the manufacturers of pharmaceutical products. These products are expensive, because it costs a lot to develop them, and because those costs have to be recouped before the patents expire. A firm with an effective new drug has a monopoly, but that does not permit it to interfere with research done elsewhere, and the effect of competition is to improve the range of products prescribed.

For the consumer, the gains in efficacy have been enormous. Other costs arise when the drugs are shown to have dangerous side-effects, or when people argue that they are being used inappropriately (“off-label” prescribing) or indeed if they allegedly don’t work at all. Competitors are quick to pounce if they can find weaknesses in licensing or patent procedures, and this, too, can lead to litigation.

PHARMAC can award a contract to just one preferred supplier, making all other brands of the same drug uncompetitive, in exactly the same way as casualty departments, where all attention is free, are ruling many general practitioner services out of contention. What follows is taken from the Half Year Results 2007 report put out, by the company itself, to all shareholders in AstraZeneca.

In May 2007, the New Jersey Ironworkers Local Union No. 68 filed a class action suit against AstraZeneca on behalf of all individuals and non-governmental entities that paid for Seroquel from January 2000 to date. The lawsuit…alleges that AstraZeneca promoted Seroquel for off-label uses and misled class members into believing that Seroquel was superior to the other, lower-cost alternative medicines.

The company believes this suit, and others similar, to be without merit and intends to vigorously defend the claims. Elsewhere, the Report notes that, “as of 26 June 2007, AstraZeneca was defending 5839 served or answered lawsuits involving approximately 10,000 plaintiff groups. To date, about 645 cases have been dismissed.”

Another suit against AstraZeneca (and two other companies) “seeks to recover the cost to the Pennsylvania Medicaid program and other state-funded health insurance programs for prescriptions written as a result of the alleged off-label promotion….The Company believes these claims to be without merit and intends to vigorously defend the Pennsylvania lawsuit.” The Company “has been sued in numerous individual personal injury actions involving Seroquel. In the overwhelming majority of these cases, the nature of the plaintiffs’ alleged injuries is not clear.”

How does one assess accurately the efficacy or the alleged dangers of any psychotropic agent? How does one convince a judge one way or the other?

If people are relieved from the need to pay directly, and on their own behalf, for either the drugs or the legal battles such as class actions, then we can expect to see interference, uncertainty, bureaucratisation, litigation, and increased costs. These costs must impact on the prices of the drugs, wherever they are supplied.

Roger M Ridley-Smith
Retired GP, Wellington
Cervical cancer prevention, feminism, and Herb Green

The raison d’être for the National Cervical Screening Programme (NCSP) is the prevention of cervical cancer, yet the Programme is not prepared to endorse a publicly funded organised human papilloma virus (HPV) vaccination programme. Both the NCSP and the Auckland Women’s Health Council (AWHC) are selectively publishing negative perspectives on the vaccine.1,2

Thirty years were to elapse between the first recommendation (by an international authority, Dr G Wied) for the introduction of a nationally organised cervical screening programme in New Zealand and its eventual introduction following the Cervical (pre) cancer Inquiry by Judge Cartwright. During this time thousands of women unnecessarily developed cervical cancer, many of whom died. The change from an opportunistic to a nationally organised screening programme has resulted in a marked reduction in the incidence and mortality from cervical cancer.

While we should celebrate the success of the Programme, we should note that even after 17 years the Programme has still not quite achieved its target of 75% coverage for the entire population—and only 50% for Māori and Pacific Island women. Importantly, 80% of women who develop cervical cancer in New Zealand today have not had regular smears.

The introduction of the HPV vaccine is the single most important event in cancer prevention and the NCSP should be embracing and supporting its introduction. Evidence for the efficacy in the prevention of HPV types 16 & 18 infection and disease (which represents 70% of cervical cancers) and many vulval, vaginal, and oropharyngeal cancers, and the safety of the vaccine is now established in numerous excellent international studies (which include New Zealand participation).

The July 2007 Newsletter of the National Screening Unit briefly acknowledges the ‘potential’ approach of the vaccine to cervical cancer prevention but quotes only one of the large number of international papers which attest to its efficacy, economic benefits, and safety. Almost the entire newsletter focuses on concerns which need to be addressed before a “mass population based vaccination programme can be rolled out”. Almost all of the concerns raised in the NCSP newsletter have been extensively addressed by respected authorities. This vaccine has been tested more intensively than any vaccine at the time of its introduction to the market and Medsafe expedited approval for its introduction.

The AWHC has supported the NCSP/Government in not funding the vaccine on the basis that the effects of the vaccine on 12 & 13 year old girls is unknown and that they have not been included in a major trial. There is a simple answer for this—it would have been unethical to do so, nor would the benefits be seen for some decades. It is ironic that the AWHC who campaigned so vigorously against Dr Green’s “wait and see” approach to the management of cervical precancer should now fail to promote a vaccine designed to prevent precancer. Appropriate clinical evaluation has been conducted in young girls.
The reluctance of the NCSP to support the introduction of a publicly funded nationally organised HPV vaccination programme flies in the face of international evidence. The earth is not flat. What are the reasons for their reluctance? This must include pressure from the Government/MOH (in spite of the support for vaccine introduction by the Ministry Immunisation Technical Working Group), feminist groups, and a fear that the introduction of the vaccine will “potentially lead to an increase in cervical cancer”.

Cervical cytology screening and HPV vaccination are complementary.

New Zealand is a small country—we must become involved in, and accept, the conclusions of international studies. We need to be involved in international studies (e.g. on prevalence) rather than trying to ‘reinvent the wheel’ locally.

Ronald W Jones
Clinical Professor of Obstetrics and Gynaecology, National Women’s Hospital Auckland

References:


Daniel Grant Johnston

Taranaki man Grant Johnston had a special breed of courage. At 19, after 4 years on the family farm at Eltham, he returned to secondary school because he wanted to be a doctor. Stratford Boys’ High School insisted he wear school uniform. It included schoolboy short pants. So he did. In a year he caught up 4 years of physics and Latin (an entry requirement in those days) and won a place at Dunedin’s medical school.

Grant qualified well, became a highly regarded general practitioner and later trained in London as an eye surgeon.

He performed New Zealand’s first artificial lens implant in Hamilton about 1960, paving the way for major advances in the treatment of cataract. Today it is routine procedure. Grant had learned the technique in England.

Many hundreds, perhaps more through the years, owed restored vision to Grant Johnston.

And others also owe much to his medical skills. Many of them paid final tribute at his funeral. Grant died at his Hamilton home on Wednesday July 11. He was not ill; he didn’t wake up for the everyday early morning cup of tea brought to him by wife Nan.

He had celebrated his 90th birthday 11 weeks earlier. That was a great party, his family says. “It went on all day.” Both daughters came home from Australia for the occasion. Grant received more than 80 birthday cards: “Not bad for a 90-year-old,” says daughter Rae. His funeral packed St Andrews Presbyterian Church. Among those present were now-middle-aged people he delivered as babies in his Taranaki GP days.

Grant was the third of five children of Charles and Florence Johnston, of Eltham. Charles was a watchmaker and jeweller but the family also had a small dairy farm. Grant left Stratford Boys’ High School at 15—they were hard days in the bite of the Great Depression. They were hard times for farmers with slashed incomes, and few country people could afford watches and jewellery.

For four years Grant was a farm worker. He developed a dream of one day becoming a Veterinary surgeon, a dream never realised. Vet training was in Australia and because of this cost much more than medical training. Grant settled for medicine.

But first, back to school. A full-grown, well-muscled young man, he must have felt ridiculous in a schoolboy desk, but he braved it all and dedicated himself to physics and Latin.

At 21 he started his medical school years, completing in 1943. A year at Auckland Hospital was followed by a year at Rotorua Hospital. In 1942 while still medical school he married Invercargill lass Ivy (Mac) McMurdo. In 1946 he entered private practice at Kaponga, not far from Eltham. His district extended to Opunake on the coast. A chance meeting with a colleague in 1953
brought an invitation to become resident medical officer of Niue. One of his first tasks was stitching the head of younger daughter Carol who split her scalp in a fall. At Niue he did everything—it was deep-immersion medicine.

A Dutch eye surgeon visited to operate on cataract patients. Grant assisted and his interest was whetted. He was accepted for a one-year eye surgery course at Moorfields Eye Hospital, London, followed by a job at Southampton Eye Hospital from 1957 to 1959. He returned to New Zealand and took over the Hamilton eye surgery practice of Hector Levin. He also became a visiting eye surgeon at Waikato Hospital.

The marriage to Mac ended in the 1970s. Grant launched into a very happy second marriage with Nan Olivant in 1976.

He was in regular practice until the late 1980s and even after that still did a few clinics in smaller Waikato towns for the Waikato Hospital Board. In 1991, at the age of 74, he worked on eye problems for a month on Pitcairn Island at the request of the British Government.

In retirement Grant pursued his long-time gardening hobby—he had three different homes in Hamilton and all had beautiful gardens. When he ran out of opportunities at home he set his green fingers to work at Hamilton Golf Club, creating and maintaining many beautiful plots. He was a very competent golfer and an equally competent and generous gardener.

He also played lawn bowls and, according to good friend Don Edmond, was “a most worthy opponent” at Claudelands Bowling Club. Don and Grant shared membership of St Andrews Presbyterian Church. Grant was an elder and “a very fine chap”.

Grant was ever the sportsman. He played hockey for New Zealand Universities. He was a fine cricketer. He played in the Kaponga team that won the Taranaki District Cricket Competition in 1948. Rae says among highlights in her father’s life were watching cricket matches at Lord’s and visiting the Melbourne Cricket Ground.

He was also a fine and successful trout fisherman, able to cast a delicate fly to the nose of a rising brown or rainbow.

Jim Macdiarmid, an eye surgeon who worked with Grant for 30 years, describes him as “finely skilled, a dextrous surgeon”. They developed the Hamilton Eye Clinic at Cassell Hospital.

GP Alex Paterson dubs Grant “a man of great excellence in his work—a superior type of person”. They met soon after Grant arrived in Hamilton and developed close relationships socially and professionally.

When Alex’s 3-year-old daughter developed a squint he asked Grant to fix it. Grant straightened the eye; it never gave any further problem. She doesn’t wear glasses. “He worked to a very high standard,” says Alex.

Grant is survived by Nan, daughters Rae and Carol, and four grandchildren.

Roy Burke of the Waikato Times wrote this obituary under the heading Doctor with an eye for his patients. We thank the Waikato Times for allowing us to republish.
Ross Gordon

Ross Gordon (MNZM) the last of a family dynasty of general medical practitioners, died in Stratford (Taranaki), the town where he was born 84 years ago and where he practised for 46 years.

He was one of three sons of Dr Bill and Dr Doris Gordon, who came to Stratford in 1919 and bought Dr Tom Paget's practice. His brother Dr Graham Gordon died in 2004.

The Gordons between them spent a cumulative 195 years in medical practice in Stratford. They were one of three long-lasting, dedicated medical families, along with the Stevens and Carey-Smiths. They were involved in local politics, battles to save services, and in community organisations.

Dr Ross retired in 1998 when he was 75. His father Bill had still been seeing patients at age 90.

A close friend, Hugh Thomson—who is still a practising partner in his father's Stratford law firm at the age of 88—says what attracted and retained so many capable GPs was the large local hospital "and they stayed here because Stratford was and still is a good clean town."

Leo Carrington, who served as mayor while Ross Gordon was a borough councillor (1965–74, his last term as deputy mayor) says doctors seemed to get attached to Stratford and made it a lifetime stay. "It had a fairly large hospital with modern facilities for a small town until it closed in the late 1990s. The doctors became very much part of the community."

David Walter, local historian and a former mayor, said he did not know Ross Gordon very well, but they worked together on trying to save the Stratford Hospital services. "He was one of an outstanding family who provided medical services and were very involved in the community. Ross contributed much to the wider community, in more than the medical sense."

Dr Ross Gordon qualified at Otago University in 1947 and specialised in obstetrics and gynaecology. After 6 months postgraduate training in England, he returned to work for the Stratford Hospital Board, where he stayed for 20 years.

He was proud of having helped to fluoridate the town’s water supply, while a borough councillor. He was made a Member of the New Zealand Order of Merit in 2001.
Richard Woodd wrote this obituary under the heading *Medical dynasty loses final member* in the *Taranaki Daily News* on 27 July 2007. We thank them for the permission to republish. Also see [http://www.pukeariki.com/en/stories/scienceAndMedicine/rossgordon.htm](http://www.pukeariki.com/en/stories/scienceAndMedicine/rossgordon.htm)
GRANTS AWARDED JULY 2007

At the July meeting of the Scientific Advisory Group of the National Heart Foundation, a total of 28 grants were awarded. The awards included 8 Project Grants, 10 Fellowships/Scholarships, 5 Small Project Grants, and 5 Travel Grants. A total of 7 Summer Studentships were also awarded to the Medical Schools at the University of Otago and the University of Auckland.

PROJECT GRANTS

Drs Chris Charles & David Jardine
Christchurch Cardioendocrine Research Group, Department of Medicine, Christchurch School of Medicine & Health Sciences, University of Otago
Inhibition of cardiac sympathetic nerve activity: novel therapies post-MI
$176,179 for 3 years.

Dr Anna Pilbrow
Cardioendocrine Research Group, Department of Medicine, Christchurch School of Medicine & Health Sciences, University of Otago
Genotype and gene expression in heart failure using Affymetrix technology
$63,199 for 1 year.

Professor Ed Mitchell
Department of Paediatrics, University of Auckland
Determinants of obesity and cardiovascular risk factors at 11 years of age
$120,000 for 30 months.

Dr Leigh Ellmers
Department of Medicine, Christchurch School of Medicine & Health Sciences, University of Otago
Effect of chronic Urocortin 2 treatment following experimental myocardial infarction
$92,595 for 1 year.

Ms Suzanne Pitama
Maori/Indigenous Health Institute, Christchurch School of Medicine & Health Sciences, University of Otago
The Maori community Heart Study –Non-Maori cohort
$129,527 for 2 years.

Professor A Mark Richards
Christchurch Cardioendocrine Research Group, Christchurch School of Medicine and Health Sciences, University of Otago
Regional secretion and clearance of novel peptides in health and heart disease
$155,340 for 2 years.

Dr Louise Signal
Department of Public Health, Wellington School of Medicine & Health Sciences, University of Otago
Promoting healthy childhood nutrition through primary schools: a study of barriers, supports, and effective policy options
$150,000 for 2 years.

Dr Nigel Wilson
Department of Paediatric and Congenital Cardiac Services, Starship Children's Hospital, Auckland District Health Board
Prevalence of rheumatic heart disease in South Auckland children
$84,880 for 18 months.
FELLOWSHIPS

Dr Ruvin Gabriel
An Overseas Training & Research Fellowship (for 1 year) was awarded to Dr Ruvin Gabriel who will work as a Clinical & Research Fellow at the Cleveland Clinic Foundation, USA.

Ms Jade Hollis-Moffatt
A Research Fellowship (for 3 years) was awarded to Ms Jade Hollis-Moffatt, Department of Biochemistry, University of Otago.

Dr Tania Riddell
A Research Fellowship (for 3 years) was awarded to Dr Tania Riddell, Section of Epidemiology & Biostatistics, School of Population Health, University of Auckland.

Ms Nicola Scott
A Research Fellowship (for 3 years) was awarded to Ms Nicola Scott, Christchurch Cardioendocrine Research Group, Christchurch School of Medicine and Health Sciences, University of Otago.

Ms Helen Eyles
A Postgraduate Scholarship (for 3 years) was awarded to Ms Helen Eyles, Clinical Trials Research Unit, School of Population Health, University of Auckland.

Dr Judith MacCormick
An Overseas Training & Research Fellowship (for 1 year) was awarded to Dr Judith MacCormick who will work as a Clinical & Research Fellow at the Children’s Hospital, Boston, USA.

Ms Melody Oliver
A Research Fellowship (for 3 years) was awarded to Ms Melody Oliver, Centre for Physical Activity and Nutrition Research, Auckland University of Technology.

Dr Vanessa Selak
A Research Fellowship (for 3 years) was awarded to Dr Vanessa Selak, Clinical Trials Research Unit, School of Population Health, University of Auckland.

Dr Shieak Tzeng
A Research Fellowship (for 3 years) was awarded to Dr Shieak Tzeng, Department of Surgery & Anaesthesiology, Wellington School of Medicine & Health Sciences, University of Otago.

Ms Nicola Scott
A Maori Cardiovascular Research Fellowship (for 2 years) was awarded to Ms Amy Norman, The Liggins Institute, University of Auckland.
SMALL PROJECT GRANTS

**Associate Professor Brian Cox**  
Department of Preventive and Social Medicine,  
Dunedin School of Medicine, University of Otago  
*Heart disease mortality after radiotherapy*  
$15,000 for 1 year.

**Ms Elizabeth Ledgerwood**  
Department of Biochemistry, University of Otago  
*Can an antioxidant targeted to mitochondria inhibit lesion development and pro-inflammatory signalling in a mouse model of atherosclerosis?*  
$14,778 for 1 year.

**Professor David Thomas**  
Department of Social & Community Health,  
School of Population Health, University of Auckland  
*Awareness of cardiovascular disease risk factors among adult New Zealanders*  
$15,000 for 6 months.

**Dr Tania Riddell**  
Section of Epidemiology & Biostatistics, School of Population Health, University of Auckland  
*Whanau-based cardiovascular risk assessment and management*  
$15,000 for 4 months.

**Ms Nicola Scott**  
Christchurch Cardioendocrine Research Group,  
Department of Medicine, Christchurch School of Medicine and Health Sciences, University of Otago  
*Establishing a mouse model of the human metabolic syndrome*  
$14,365 for 1 year.

**Mr Hamish Prosser**  
Christchurch Cardioendocrine Research Group,  
Christchurch School of Medicine & Health Sciences  
*European Society of Cardiology Congress 2007, Vienna, Austria*

**TRAVEL GRANTS**

**Dr Ruvin Gabriel**  
Greenlane Cardiovascular Service, Auckland City Hospital  
*European Society of Cardiology Congress 2007, Vienna, Austria*

**Dr Brett Shand**  
Lipid and Diabetes Research Group, Christchurch Hospital  
*5th Annual world Congress on the Insulin Resistance Syndrome, Boston, USA*

**Ms Sarah Molyneux**  
Biochemistry Unit, Canterbury Health Laboratories  
*5th Conference of the International Coenzyme Q10 Association, Kobe, Japan*

**Mr Euan Rodger**  
Department of Biochemistry, University of Otago  
*The 16th International Symposium on Drugs Affecting Lipid Metabolism, New York, USA*
Essential cardiac catheterization


Absolute indications/need for cardiac catheterisation/angiography often remains debated and in flux. Determining variables of patterns of practice can often be funding, reimbursement arrangements, and attitudes of doctors and patients to a technological approach to disease management and treatment.

Increased access to such tests has contributed partly to decreases in cardiovascular mortality in recent decades. Marked disparities in rates of invasive investigations are seldom however associated with large or even any observable differences in mortality or other hard clinical outcomes except in acute coronary syndromes. For stable patients, much of invasive cardiology is in aid of symptoms rather than prognosis and only a small proportion of patients require catheterisation on natural history grounds. Despite this, the growth (concerning from the point of view of funders) of invasive cardiology comes from its potential to markedly improve symptomatology and quality of life at low risk, procedural morbidity, and with prompt recovery.

This book discusses such issues briefly but addresses its focus predominantly as a technical primer for the novice or trainee in the cardiac catheterisation laboratory. As stated in preface and back cover, its goal is not to be a comprehensive all-inclusive reference but to cover the basic common-ground accepted body of knowledge necessary to make a beginning in the practice of invasive cardiology.

The only real difficulty I find with this book is the introductory section on patient selection and indications. One listed indication is, “to confirm the absence of coronary artery disease in the nuisance patient” (my italics). Undoubtedly invasive testing clarifies the underlying factor(s) of a patient’s chest pain and potentially serves as reassurance in regards organic illness but only if the emphasis is put on addressing patients’ original concerns and assumptions. Only in this therapeutic context is there value in performing a procedure and there is otherwise equivocal scientific evidence of preventing acute re-presentation and improving subjective morbidity.

Similarly this section could have gainfully included a list of conditions (mostly acute coronary syndrome settings) where invasive testing has Class 1 indications to reduce unplanned readmissions, re-infarction, death, and high likelihood of poor symptoms leading to revascularisation at a delayed juncture. These indications now have a robust Level A evidence base and should form core knowledge for cardiology and physician trainees.

The book is particularly strong and possibly the current best at describing technical aspects of performing radial artery catheterisation and no doubt benefits from the authors’ extensive experience in this regard. A very cogent case is made for its advantages and probably trainees should be more proactively introduced to this approach at an earlier stage rather than the tradition where they are allowed to learn radial procedures after completing 500–1000 femoral procedures.
The figures and sections on aortic anatomic variations, congenital heart disease, and common surgical corrections are similarly excellent and one of the few rare examples of being simple and understandable.

There will always be omissions in an introductory textbook but priority could have been given to more detail on retro-peritoneal haemorrhage recognition and management, and emphasis put on the need to involve vascular interventionalists or surgeons. Similarly, there are aspects of pericardiocentesis technique in the cath lab worth mentioning such as utility of using both pressure transducer, and fluoroscopy of the 0.24” or 0.35” J-wire to confirm correct needle placement and thus avoiding pitfalls of being in the right ventricle or peritoneal space before catheter placement and drainage.

Overall however, this book should be amongst the first rank to begin a succinct (300 page) grounding in essentials for the nevertheless serious student of invasive cardiology and is a convenient lab-pocket size format to complement hands-on practical training.

Victor Chen
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Dunedin Hospital
Dunedin
Clinical cases in emergency medicine: a physiological approach


Don’t you find that occasionally you pick up a text and think “Wow, I wish I had this as a student”? Well, for me, this is one of those texts. One of the Clinical Case Series produced by McGraw-Hill, this pocket sized book is a little beauty. It is a collection of real cases derived from everyday practice in the Emergency Department at the Royal Hobart Hospital. Each of the 12 cases has a timeline, following the progression of the patients’ condition and treatment. There is an emphasis on an integrated approach to clinical medicine, something lacking in traditional medical texts, but a feature of much modern medical school teaching.

The text is broken up with clinical questions, clinical and physiological comments, and clinical and physiological summaries, allowing the reader to think through the case and see the situation in a more holistic manner. Each chapter finishes with a review, with a set of answers at the end of the book.

It is written in a bright breezy style, as if the author is standing next to the reader and supervising, offering words of wisdom and advice, guiding them through each clinical scenario. The layout of the text is mostly clear and well-designed, although I found the reproductions of the ECGs rather small, and plain X-rays (which are always difficult to clearly reproduce) are just adequate. The photographs of equipment and patients, however, are excellent, and add greatly to the overall feeling of realism.

In summary, this book is a great introduction to the thrills and excitement of a modern Emergency Department, packed with excellent educational material relating and applying theory into practicality. It would be an invaluable aid to Clinical Medical Students as well as junior doctors in the Emergency Department.

David Richards
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