

Department of Education, Training and Youth Affairs

Provision of Medical Education in the North of Australia

Final Report

Prepared by KPMG Health Care & Life Sciences

On behalf of
The Flinders University of South Australia
The University of Queensland

98/19

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The views expressed in this report do not necessarily reflect the views of the Department of Education, Training and Youth Affairs.

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1. Background, project objective and outcome

1.1 Background

The James Cook University and the State Government of Queensland have proposed the establishment of a medical school in north Queensland, which has an emphasis on the provision of medical services in rural and remote areas. The medical school would be open to school-leaver applicants from northern Australia. The University of Queensland (UQ) and The Flinders University of South Australia (FUSA) currently have clinical schools in north Queensland and the Northern Territory respectively. These schools are associated with graduate entry medical courses.

The Department of Education, Training and Youth Affairs (DETYA) supports the objective of the James Cook proposal to increase recruitment and retention of northern Australian students into medicine, but it is concerned that a range of options to address this is canvassed. In particular, it is concerned about the efficacy of adding new infrastructure, given the level of medical education infrastructure already available across Australia. The Commonwealth Department of Health and Family Services (CDHFS) is also concerned about an increase in the number of students enrolled in medical schools.

This current study was funded by DETYA through a grant to FUSA working with UQ to explore options for the delivery of medical education in the north of Australia from within existing arrangements. It investigates viable alternatives to the James Cook University approach involving collaborative models with existing providers and use of advanced delivery technologies.

The goals of the project as established in the original brief are to investigate:

- how the medical schools of The Flinders University of South Australia and The University of Queensland can together (using advanced delivery of technologies) ensure the best provision of medical education and medical care in the north of Australia; and
- whether other tertiary institutions in the region can be usefully involved in this provision and, if so, how.

1.2 Project objective

The specific objective of the project is to identify and evaluate alternatives to a new medical school for providing medical education in the north of Australia, that use existing medical education provider arrangements and innovative delivery models.

Options which meet this objective have three key features:

- **the use of innovative delivery models** which access the established expertise across the multiple hospital and community-based sites in northern Australia;
- **the use of state-of-the-art information technologies** to support instruction and training from a distance such as teleconferencing, telemedicine and email; and
- **collaborative approaches involving partnerships and joint ventures** between existing medical schools and other tertiary institutions.

1.3 Project team

KPMG was appointed to manage the project. Mr Tony Loan was selected as Project Manager. Other members of the team were chosen from the two universities.

Associate Professor David Prideaux
Head, Office of Education School of Medicine
Flinders University

Professor Nick Saunders
(then) Dean of the School of Medicine and Head of the Faculty of Health Sciences
Flinders University

Professor Ernest Hunter
Professor of Public Health, North Queensland Clinical School, University of Queensland

Professor Bryan Campbell
Head Graduate School of Medicine, University of Queensland

Professor Terry Nicholas,
Head of the Department of Physiology, Flinders University, accompanied the team in the visit to North Queensland to provide advice on the teaching of basic sciences.

1.4 Outcome

This report examines three viable options to deliver medical education in the north of Australia and their potential strengths and weaknesses. The options selected reflect the views of providers of medical education and other stakeholders in the process. The report makes a recommendation to DETYA on a preferred delivery model and outlines an approach to further progress development and implementation of this model.

The report is one of three recently completed reviews of medical education in the north of Australia. A report on the proposal from the James Cook University of North Queensland to establish a new medical school has been prepared by the North Queensland Medical School Working Party for the Commonwealth and State Ministers of Health.

The University of Queensland has recently sponsored a Review of the North Queensland Clinical School of the Graduate School of Medicine at the University. The findings of these two reports are not considered in great detail here but should be read in conjunction with the recommendations of the DETYA funded project.

2. Methodology

2.1 Introduction

The contract to undertake this consultancy was signed in mid-November of 1997. The Project Team was appointed in December and a briefing paper written for the project.

In 1998 the project progressed through four stages:

- current situation assessment January–early February
- stakeholder consultation late February–April
- option evaluation May
- report preparation May

2.2 Current situation assessment

During this phase there was consultation within the medical schools at tThe Flinders University and The University of Queensland and in their clinical schools in the Northern Territory and North Queensland to assess existing provisions. This included discussions on graduate entry admissions processes and the existence of quotas for designated groups of students, curriculum structure, teaching and learning methodologies, clinical placements and the use of information technology. There was also a review of documents on the demography of the north of Australia and medical workforce needs.

A more detailed brief for the project was developed during this phase. It was presented for discussion to the Steering Group at a teleconference in early February and was used to guide the subsequent development of the project.

2.3 Stakeholder consultations

Potential stakeholders in medical education in the north of Australia were identified during the current assessment phase. A letter was prepared for distribution setting out details of the Project Team and the background to the project itself. Stakeholders were invited to submit their views on the current arrangements for medical education in the north of Australia and the ways in which the arrangements might be enhanced. Four options were given as examples: enhancement of flexible delivery arrangements in years three and four of the existing medical courses in the clinical schools, wider distribution of student placements in the north of Australia, provision of all four years of the graduate

entry courses in the north of Australia and special entry provisions for residents and indigenous people in the north. The full text of the letter can be found in Appendix A.

The letter was sent to a range of stakeholders in the north and other parts of Australia. These included:

- all Australian medical schools and universities in the north of Australia;
- other health education institutions and organisations with interests in the north of Australia;
- central and regional offices of the state health departments in the north of Australia;
- Aboriginal medical services;
- rural health training units in the north of Australia;
- university departments of rural health;
- other health service organisations and groups including the Royal Flying Doctor Service and the Australian Medical Association; and
- other individuals with expertise and knowledge of medical education in the north of Australia.

Individuals, groups and organisations from whom replies were received are set out in Appendix B.

Members of the team made visits to:

- Alice Springs and Darwin to consult with representatives of the Northern Territory University, the Menzies School of Health Research and the Northern Territory Clinical School and Territory Health Services;
- Perth to hold discussions with staff of the Faculty of Medicine and Dentistry at The University of Western Australia, the Health Department of Western Australia and the Western Australian Centre for Rural and Remote Medicine (WACRRM);
- North Queensland to consult with staff of the James Cook University and the North Queensland Clinical School; and
- Canberra for discussions with representatives of the Commonwealth Department of Health and Family Services.

Further details of individuals consulted during the visits are found in Appendix C.

2.4 Options evaluation and report preparation

A series of teleconferences was held over the term of the project and emerging ideas were defined and organised into themes and categories. Information from letters and visits was summarised and used to inform the discussions. A one-day face-to-face meeting was held in Adelaide in May to evaluate the options and prepare for report writing.

During the one-day meeting the three models outlined in this report were developed, subjected to critique and a report format drawn up. A draft report was prepared and distributed to the Vice-Chancellors of the Flinders and Queensland Universities and the Steering Group before the final report was prepared.

3. Existing situation

3.1 Workforce needs in north Australia

There is plenty of evidence to show that there is a significant shortage of general and specialist medical practitioners in rural and remote areas of Australia, particularly in the north of Queensland and northern Western Australia. In 1995, the number of medical practitioners per 100,000 persons ranged from 130 in capital cities to 107 in large rural centres to 65 in 'other remote areas'. The Australian Institute of Health and Welfare (AIHW) also showed that there were inequities in workforce distribution among the States and Territories, with Western Australia and Queensland having 88 per cent and 84 per cent respectively of the national number of employed medical practitioners per 100,000 population.

There is an acknowledged inequity of access to medical services for people living in rural and remote communities. There is also evidence that rural health communities may have poorer health outcomes than urban communities. However the reasons for this are complex and multifarious, and cannot be solely attributed to the inequity of access to medical services. The causes of poor health in rural and remote areas are multi-functional and may be explained by a combination of lifestyle, cultural and awareness factors. Some of the poor health structure can be explained by the much larger proportion of indigenous people in rural and remote areas who, as a population group, tend to have comparatively poor health status. Nevertheless, low numbers of primary care providers in rural and remote areas must contribute to the overall poor health status.

A number of efforts have been made to quantify the shortage of doctors in rural areas. The Australian Medical Workforce Benchmarks (1996), produced by the Australian Medical Workforce Advisory Committee, estimates the rural under-supply of general practitioners at around 500 (445 FTE). The estimated shortage of 445 FTE general practitioners included Queensland (102), Northern Territory (12) and Western Australia (41). This estimate is consistent with the figures of the Rural Doctors Association of Australia. They estimated there is 500 FTE shortfall through a survey and consultation process.

The Divisions of General Practice and the Royal Australian College of General Practitioners disputed the 500 benchmark by arguing that areas outside large country towns should be considered 'rural' and had real workforce shortages. These areas (so defined) had 82.6 GPs per 100,000 population in 1995, compared with 107.6 per 100,000 population for the large country towns. If this provision of 82.6 per 100,000 population were lifted to a large rural town benchmark of 107.6 per 100,000 population, then the number of practitioners needed would increase to some 1,020. Discussion with AIHW suggests the level of shortage in rural areas is probably somewhere between these two estimates of 500 to 1,000 practitioners across Australia.

Both Western Australia and Queensland have relied heavily on employment of temporary resident doctors (TRDs) to cover these shortfalls. In 1995–96, a total of 980 doctors migrated to Australia for employment as TRDs with most being employed in Queensland and Western Australia. The Commonwealth announced in 1996 that it would implement a policy to scale down the use of TRDs.

3.2 Addressing the shortfall

When state medical school numbers are examined against state population, Western Australia and Queensland both have much lower ratios than the other States, particularly South Australia and New South Wales. Given that the majority of graduates seek to practice in the State of graduation, then some States argue that they are disadvantaged in workforce planning. Queensland and Western Australia both have major problems with rural workforce and both employ high levels of TRDs to staff their rural and urban hospitals. The Commonwealth is committed to reducing the number of TRDs in Australia. However, unless more Australian doctors can be encouraged to work in rural Australia, particularly Queensland and Western Australia, there will be a serious medical staffing shortage as TRDs are reduced.

The AIHW reports that, on the basis of current statistics, doctors most likely to practise in rural areas are Australian-born, male and rural residents, then these characteristics are significantly under-represented among medical students compared with the proportion of the population of Australia in rural and remote areas.

Over the period 1989–96, of all commencing medical students, 89.4 per cent originated from a capital city or other metropolitan area, 10.1 per cent from a rural area and 0.5 per cent from a remote area. In contrast, 71 per cent of the population were living in metropolitan areas, 26 per cent in rural areas and 3 per cent in remote areas. These percentages are based on postcode data gathered from students on enrolment. They may underestimate the actual number of rural and remote students in medical schools because they do not necessarily take into account the origins of students who may have moved to metropolitan areas for secondary education. The Committee of Deans of Australian Medical Schools is establishing procedures whereby accurate information on the origins of students enrolling in medical schools can be obtained.

Also, in the period 1989–1996, some 64 students commenced medical courses who self reported as Aboriginal or Torres Strait Islander. This represents 0.7 per cent of all commencing students. Twenty-five of these 64 students commenced at The University of Newcastle. At the 1991 census, 1.6 per cent of the Australian population identified as Aboriginal.

The AIHW concluded that

this may cement current rural medical workforce shortages for some years as incentive schemes for metropolitan doctors to practise in rural areas have existed for many years and have not increased the proportion of doctors residing in rural areas. However, university policies to increase numbers of rural and indigenous students in the future will help redress the imbalance in the mix of medical students.

The effect of these university policies will be seen over the next few years as will the effect of the admissions procedures in the graduate entry schools which commenced in 1996–97. They both allow for rural students to compete for entry to medical school on the basis of study in a first degree rather than in high school. This provides increased opportunities for rural students to develop the knowledge and skills required to compete for entry.

3.3 Ways of meeting needs from existing medical schools

Clinical experiences in the north

As well as recruiting students from rural areas it is important that students are able to undertake satisfying educational placements in rural areas during their undergraduate courses. This can also contribute to increased recruitment and retention in rural areas.

Three metropolitan medical schools provide significant opportunities for students to study in the north of Australia: The University of Western Australia, The Flinders University of South Australia and The University of Queensland. The initiatives of each of the medical schools with interests in the north are discussed in the following sections of the report. The Flinders University and The University of Queensland have established clinical schools in the Northern Territory and north Queensland, respectively, with considerable support from the relevant territory/state health services.

In the two clinical schools, cohorts of students undertake the final two years of the Flinders and Queensland medical courses from bases in Darwin and Townsville. They participate in clinical rotations in medicine, surgery, obstetrics and gynaecology, paediatrics and psychiatry in teaching hospitals in the larger cities and undertake general practice and community health placements throughout the north. There are also opportunities for electives and guided option placements in hospitals and communities throughout the region.

The studies have a distinct emphasis on northern Australian health issues and students have opportunities to gain experience in tropical health, public health, Aboriginal and Torres Strait Islander health, rural and remote health and other related areas. Teaching and assessment is done by staff appointed to the clinical schools and by staff recognised by the metropolitan universities through the awarding of academic status. Students are assessed locally using the same methods and by the same standards as their Adelaide and Brisbane peers, although the different emphases of their clinical experiences are reflected in some of the content of assessment. Adelaide and Brisbane-based students may choose to take some shorter term elective placements in the clinical schools.

North Queensland

Medical education in north Queensland is currently provided through the North Queensland Clinical School, one of the three clinical schools emerging from the

recent restructuring of The University of Queensland Medical School. The North Queensland Clinical School was launched in 1993 as a cooperative venture between The University of Queensland, the James Cook University and Queensland Health, following extended negotiations and the signing of a Memorandum of Understanding between the respective Vice-Chancellors the year before. Professor Peter Mudge was appointed as Interim Deputy Dean in 1992 and subsequently Foundation Clinical Dean in 1993. Professorial appointments were made for the Departments of Medicine, Surgery, General Practice and Psychiatry based at Townsville General Hospital in 1993, with appointments made in Public Health and Obstetrics and Gynaecology based in Cairns in 1996. As yet the position of Professor of Child Health, designated for Cairns, has not been filled. Other academic positions exist in both of these cities as well as Mackay and Mt Isa. In addition to medical student teaching, the North Queensland Clinical School has coordinated registrar-training programs.

Small groups of medical students from The University of Queensland have been located in northern Queensland for their medical and surgical terms for a considerable time. In 1993 the North Queensland Clinical School began accepting students from the senior years of the six-year course on a voluntary basis, primarily in Townsville. In 1997 The University of Queensland had its first intake into the new four-year graduate entry medical course (GMC) which will eventually replace the six-year course. In 1997 and 1998 small numbers of GMC students travelled to north Queensland during their first and second year clinical immersions. In 1999, forty year three GMC students will be based in north Queensland with a further forty students in year four in 2000. Thus, when the North Queensland Clinical School is fully operational there will be 80 students over the two years plus other students from The University of Queensland who choose shorter term elective placements in the north. While the academic centres of the North Queensland Clinical School have been Townsville, Cairns and, to a lesser extent, Mackay, medical student placements are made throughout northern Queensland.

In late 1997, a review was conducted of the North Queensland Clinical School as part of the evaluation of progress required by The University of Queensland and Queensland Health. The major recommendations of the review are to strengthen the Clinical School, provide for more substantial experience for students within it and expand its operation, provided additional resources are identified and that additional fields of academic strength are identified at the James Cook University.

A fundamental issue raised in the review related to existing tensions between The University of Queensland and the James Cook University which have increased over the last two years. These tensions have developed despite the establishment of collaborative relationships across certain disciplines in teaching, resource development and research and appear to be related to resource considerations affecting both institutions.

Northern Territory

In 1996 The Flinders University of South Australia was the successful bidder to establish a Northern Territory Clinical School at the Royal Darwin Hospital.

The new clinical school has been supported by funds of \$1.59 million per annum from the Territory Health Services and \$125,000 each from Flinders University and the South Australian Health Commission.

A quota was established for the Northern Territory residents within the 58 places in the Flinders University program. It was planned that the ten students would complete years one and two of the graduate entry medical course in Adelaide and return to the Northern Territory for the final two years. Students within the Northern Territory quota must still obtain satisfactory scores in the entry test (GAMSAT) and in previous tertiary studies but are interviewed in Darwin and compete against each other for quota places. A quota was also established for five Aboriginal and Torres Strait Islander students from all over Australia.

In 1997 the staff of the Clinical School participated in the accreditation of years three and four of the graduate entry medical course. The Australian Medical Council Accreditation Team visited Darwin. There was joint planning of the final two years of the course between Adelaide and Darwin based staff, with some face-to-face meetings but with the majority of business being conducted by video-conference.

Professor Alan Walker was appointed as the Foundation Clinical Dean and senior academic appointments followed in Medicine, Surgery and General Practice in 1996 and in Obstetrics and Gynaecology, Psychiatry and Public Health in 1997.

An Associate Dean, Dr Antonia Bagshawe and subsequently Dr John Erlich, was appointed to oversee the development of a branch of the Clinical School in Alice Springs. In 1998 Professor David Brewster succeeded Professor Walker as Clinical Dean.

Up to and including 1998 selected students in the six-year course at Flinders University undertook medical and surgery rotations in their final year in the Royal Darwin Hospital. They also undertook electives and clinical options in Alice Springs and other parts of the Territory.

In 1998 eight Australian and two overseas full fee-paying students commenced their year three studies in the Clinical School, which will also provide a base for their elective and selective studies in year four. A purpose built facility for the Clinical School was constructed within the Royal Darwin Hospital, with the Centre for General Practice of the Royal Australian College of General Practitioners and the Centre for Clinical Nursing and Research of the Northern Territory University co-locating in the facility.

There has been cooperation between Flinders University and other health education institutions in the Territory. There has been joint teaching of public health with the Menzies School of Health Research and joint appointments of public health staff.

The Menzies School, the Northern Territory University and the Flinders University are partners in the Cooperative Research Centre in Aboriginal Health.

Discussions were held with the Northern Territory University early in the development of the Clinical School and representatives of that university participated in the Health Sciences Education Liaison Committee concerning the initial deliberations for the school, particularly relating to library and information technology issues. A Memorandum of Understanding between the two universities

for cooperation across all the endeavours of the institutions was signed. There were initial discussions about the early years of the graduate entry course being offered in Darwin with the support of the Northern Territory University, although to date most efforts have been directed at the successful establishment of years three and four. The two universities successfully applied for the establishment of a University Department of Remote Health in Alice Springs which will begin operations in July 1998.

Western Australia

Medical education is currently provided by The University of Western Australia (UWA), although the Curtin and the Edith Cowan Universities are partners in the establishment of a multi-disciplinary Department of Rural Health.

The University has 120 standard entry places in their undergraduate medical education program with up to 11 additional non-standard entry places for rural and remote area students including Aboriginal and the under-privileged. Currently, there are 10 non-standard entry students consisting of 6 high school entry level students and 4 older students, including 3 Aboriginal students funded through DETYA and 2 underprivileged students.

Rural students represent approximately 10 per cent of all students, but on a population basis rural students should represent approximately 30 per cent of student places. Some 15 to 20 of these students should come from the far north of Western Australia.

The University's other approach to improving rural student entry has been to provide remedial programs for older students and to improve the high school experience of younger people. In addition, the University conducts year 10 camps for 30 to 40 potential medical students.

Medical students are also given the opportunity to spend 8 weeks in rural areas under the supervision of specialists/General Practitioners. Some students work at Port Hedland or Derby in their intern year. While staff of the Western Australia Centre for Rural and Remote Medicine (WACRRM) considered this experience to be insufficient and recommended more community-based experience it has provided significant opportunities for students to gain rural experience with expert supervisors.

The curriculum has been recently revised to enable students to be more independent and to make greater use of information technology. For example, students are provided with lap top computers and given access to the Internet/email. This has facilitated students undertaking training in rural areas, but needs to be accompanied by a cultural change. Students need to believe that they can do as well by undertaking their study in rural areas as in Perth. A major difficulty in getting students to train in remote areas is one of communication. The areas to the far north of Western Australia are sparsely populated. In addition, many of the medical practitioners do not have the capacity to support students because of their high workloads.

3.4 Graduate entry medical programs

The Flinders University and the University of Queensland, together with The University of Sydney, have adopted graduate entry medical courses. The Flinders course began in 1996 and the Queensland course in 1997. As indicated previously, graduate entry students commenced studies in the Northern Territory Clinical School in 1998 and will begin work in the North Queensland Clinical School in 1999. Graduate entry is the predominant mode of admission to medical schools in North America and there is increasing interest in this form of entry in some universities in the United Kingdom.

It was argued that the adoption of graduate entry in the three Australian schools would bring the following advantages:

- greater control over the criteria for entry, rather than relying on results from school leaver examinations;
- increased ability to attract mature students from a diversity of backgrounds;
- facility to include demonstration of commitment to medicine as a part of the selection procedures; and
- greater flexibility to include quotas for special groups of students.

The Australian schools have adopted a three-stage process in graduate entry admission involving the Graduate Australian Medical Schools Admission Test (GAMSAT), prior performance in tertiary education and a structured interview. The three schools collaborate in the admissions process.

The introduction of graduate entry procedures in the three schools has increased the diversity of backgrounds of entrants to the medical schools and has provided greater flexibility to introduce quotas for particular groups of students who by reason of geography, culture, or social class have been denied access to medical education in the past. For example, as indicated previously, Flinders University has successfully incorporated quotas for Northern Territory residents (10) and Aboriginal and Torres Strait Islander people (5) into its existing program. Further opportunities exist in the interview process to include demonstrated commitment to working in rural and remote areas and other areas of medical need as one of the selection criteria.

3.5 Problem-based learning

The three graduate entry medical schools adopted problem-based learning for their new courses. This is an internationally recognised approach to medical education used extensively in North America, where it originated at McMaster University, and in the United Kingdom, Europe, the Middle East and Asia. In Australia it was first adopted by the medical school at Newcastle and, in addition to the three graduate entry schools, is now used at Melbourne and Adelaide Universities.

The approach is soundly based in current learning and pedagogical theory. Students learn in small groups from specially prepared cases with trained tutors. The students derive and pursue their own learning goals from the cases within a set of overall learning goals for the block or unit of work.

The case-based approach to learning allows for the integration of learning material. The basic sciences are learned along with clinical medicine. Issues relating to population and public health, psycho-behavioural medicine, law and economics can be readily incorporated in the cases. Clinical concepts are introduced early in the course and, in the case of the three Australian graduate entry schools, are reinforced by an accompanying clinical skills program. The three Australian schools also have a commitment to carry problem-based learning into the clinical rotations of the courses, thus ensuring that basic sciences and clinical education are closely integrated throughout the four years of the courses.

The cases are prepared by teams of basic scientists, clinical specialists and social and behavioural scientists with expert educational input. They thus draw on up-to-date expertise from a variety of sources. The tutors, however, do not need to be experts in their fields. Non-expert tutors guide the students through the learning process using tutor guides that accompany the student cases. However, all tutors undertake a comprehensive training program in small group learning, adult learning, providing feedback and evaluation.

In summary, the adoption of problem-based learning has allowed both Flinders University and The University of Queensland to achieve greater flexibility and integration in curriculum design, to marshal specialist resources for preparation of self-directed learning materials and to invest in staff development for effective teaching. The latter has had a flow-on effect to many aspects of clinical teaching.

Students in the Northern Territory and North Queensland Clinical School will undertake problem-based learning during their clinical experiences. For the students currently in Darwin, cases are prepared using specialist resources in Adelaide but modified using local staff in the clinical school and the Menzies School of Health Research. This has been a two-way process and issues of tropical, indigenous and rural and remote health have been introduced into cases developed for Adelaide-based students using specialist resources from the Northern Territory. Staff in the Northern Territory have undertaken tutor training in Adelaide or through teams of tutor trainers conducting programs in Darwin.

3.6 Flexible delivery and information technology

Flexible delivery and information technology have been important components of the development of the programs at Flinders and Queensland Universities and in the northern clinical schools. Students from The University of Western Australia are also able to make use of information technology during their rural placements. Of the graduate entry schools, both The University of Sydney and The University of Queensland have developed systems for distributing their problem-based cases and supporting materials to distant sites using internet and intranet technology. This allows text-based material and high quality images, video and other related material to be available to students at a variety of sites at much reduced cost.

Flinders University and The University of Queensland have also developed video-conferencing facilities. At Flinders these are used to deliver 'live' lectures to students in the Northern Territory Clinical School and other sites away from Adelaide.

These developments are supplemented by the extension of email facilities to all staff and students thus providing a mechanism of student–staff communication and for monitoring and quality control, and by the development and use of interactive computer-driven multimedia resources.

Flinders University and The University of Queensland have maintained computer development and support units to assist in the provision of these resources. Access to library and database material for evidence-based medicine has also been enhanced for students in the clinical schools and other off-site students through information technology. System management programs such as Top Class are under investigation in the medical schools for use in managing off-site learning. The use of information technology has required investment in the upgrading and development of links between the southern universities and the northern clinical schools.

Flinders University and the Northern Territory University, for example, have been successful in obtaining a grant of \$1.48 million from the Rationalising and Restructuring Program to upgrade links between the two universities which will result in improved communication between them and with the Northern Territory Clinical School.

The use of information technology has enabled student learning to be effectively supported in the Northern Territory and North Queensland Clinical Schools. A sound basis has been established through existing initiatives but further investments in infrastructure and staff development will be required as new technology becomes available and greater numbers of students study in the northern sites.

3.7 Health sciences programs in northern Australian universities

There are two independent universities in the north of Australia: the Northern Territory University and the James Cook. The main campuses are in Darwin and Townsville, respectively, but both universities have smaller campuses in other centres in their regions. The two universities have existing health sciences programs through the School of Health Sciences in the Faculty of Science of the Northern Territory University and the Faculty of Health, Life and Molecular Sciences at the James Cook University. The Anton Brienl Centre, a Public Health and Tropical Medicine Centre, is located within the faculty at the James Cook University.

Both universities have aspirations to offer free-standing medical courses. James Cook University has presented strong claims which are the subject of the report of the North Queensland Medical School Working Party. Northern Territory University forwarded a submission to this project proposing a graduate medical course for that university which would be fully operational by the year 2003.

It is beyond the scope of this project to consider the proposals in any detail but the two northern universities must be considered as significant contributors to medical education in the north of Australia.

Visits were made to both institutions and written submissions received from them. Summaries are provided in the next chapter. It was not possible nor within the scope of this project to provide a detailed assessment of the potential of the institutions to offer independent medical courses.

4. Major themes from consultations

A total of twenty-three responses to the consultation letter was provided. The responses varied widely. Some five responses were detailed submissions while others (16) were concerned with particular aspects of medical education in the north, including delivery of various and single components of the program. A small number of responses (2) considered that the project was 'irrelevant' and expressed support for an autonomous medical school at James Cook University. Overall, the quality of responses was high and provided the Project Team with approaches that could be explored during later site visits.

One group of responses took as given the promise that medical education undertaken in rural areas was more likely to lead to work in the area after graduation. These responses concentrated on the best model of delivery to meet the objectives. Submissions such as those from the Townsville District Health Service and the Mount Isa Base Hospital and Community Health Services outlined the advantages of a devolved model with local student mentoring and the benefits of developing educational themes related to rural and remote health, including indigenous and tropical health.

Collaborative approaches were emphasised in a number of submissions and a well argued submission to this effect was forwarded by Newcastle University. The submission set out three models with a preference for one which would formulate enrolment of students from north Australia in established medical schools and would ensure that a 'significant component' of their education took place in the north. Other submissions commented on the linking of developments in the north such as a medical school at James Cook with the Mt Isa University Department of Rural Health, existing clinical schools and other centres of activity. These were references to potentially high costs for travel and accommodation under such models.

Some of the major themes to emerge from these collaboratively orientated models include:

- the creation of a single North Australia Medical School, based in Townsville, Cairns, Darwin and Alice Springs and jointly operated by a consortium of local and metropolitan universities;
- the recognition and development of local centres for student placements in tropical health, infectious diseases, indigenous health and remote area health with the support of major telecommunication companies;
- the utility of a four-year problem-based learning approach;
- the delivery of basic sciences by partnerships of local and metropolitan universities using flexible learning techniques; and

- community involvement in planning with both indigenous and non-indigenous rural communities.

It is to be noted that one submission suggested the need for a multi-disciplinary approach to medical education and the importance of establishing a Memorandum of Understanding between medical education providers to progress the development of a model.

Other submissions focused on the need to entice more Australian-trained practitioners in rural and remote areas by proposing strategies to increase the intake of students from these areas such as:

- quotas for rural/remote/Aboriginal students;
- scholarships;
- positive discrimination;
- mentoring systems; and
- support structures.

These submissions also presented strategies to provide greater focus and exposure to rural health care issues during training as a means of retaining students upon graduation. The strategies included:

- resourcing small rural centres to enable them to take medical students for eight-week rural medicine programs;
- ensuring all four years of training was provided in the north;
- insisting on a 2-year internship within northern Australia; and
- ensuring wide distribution of student placements.

Others cited examples of collaborative projects which utilised flexible delivery and information technology in delivery programs to students.

Several submissions commented on the need to enhance the intellectual climate of health care across northern Australia and to increase the level of medical expertise and activity irrespective of the chosen approach. Strategies proposed to achieve these objectives included:

- the funding of professorial units;
- funding of sub-specialty tertiary services;
- funding of outreach services to provincial, rural and remote areas; and
- funding of tele-medicine and tele-conferencing between rural and remote areas and provincial and tertiary centres.

It is to be noted that we received proposals for establishment of autonomous medical schools from the Northern Territory University (NTU) and the James Cook University (JCU).

4.1 Northern Territory University

The submission outlined the strengths and capabilities of the University in offering all four years of a medical course. These included:

- experience of delivery of health education programs in the Territory and north-west Australia;
- ability to attract local students;
- expertise through the Faculty of Aboriginal and Torres Strait Islander studies and links with Batchelor College which could be applied to allocating indigenous students;
- experience in higher education, distance learning and flexible delivery;
- links with Flinders University through the existing North Territory Clinical School; and
- experience and resources in offering subjects in the social and basic sciences relevant to medical education and in developing and offering cultural awareness programs.

The submission proposed a staged five-year period for the establishment of the school, beginning with the teaching of the first two years of the Flinders University program, establishing bridging mechanisms in existing courses formulating entry to the program and eventually teaching all four years of the program with diminishing involvement from Flinders University. There would be shared expertise to avoid duplication.

Recommendations for additional resources were included, as were the advantages of geography and existing relationships on marketing the course in the near Asian region. It was concluded that an autonomous medical school could be built on existing Flinders University provisions but would develop as a focus program for medical education in the north.

4.2 James Cook University

The James Cook University submission outlined the history of involvement of the University in medical education. It pointed out that the school of Public Health and Tropical Medicine and Anton Brienl Centre had national and international reputations for the excellence of their work. The University was already involved in postgraduate courses for medical professionals and it was pointed out that the new Townsville General Hospital was to be built adjacent to the University. The submission indicated strengths in some of the basic sciences which was confirmed during the visit by the Project Team. The visit did reveal some weaknesses in Anatomy and Pathology, however.

The submission demonstrated the shortage of doctors in North Queensland and that all the medical schools had their main campuses in capital cities to the south of Townsville. There would be a commitment to attracting rural, remote and indigenous students in the new course and interviews would be used as part of the admission process to assess personal characteristics. There would be liaison with

Aboriginal and Torres Strait Islander education officers to identify prospective applicants in secondary schools.

Start up costs of \$20 million with recurrent costs of \$10 million were put forward as the result of a Business Plan prepared by a consulting company. Overall it was proposed that the new school would address workforce issues and provide an infrastructure for excellent service and education in the north of Australia.

5. Approaches and models

5.1 Planning principles

The aims and brief of this consultancy were transformed into a set of planning principles which provided the underlying basis for the deliberations and discussions. The principles ensured that there was a commitment to:

- developing medical education as a means to improving the health and well-being of the population of northern Australia;
- providing medical education of the highest standard which is flexible and responsive to the health needs of northern Australia;
- building on the capital infrastructure, strengths and capabilities present in existing medical education in Australia;
- contributing to medical workforce needs of northern Australia by attracting and retaining medical students from and to northern Australia, particularly rural and indigenous students;
- encouraging and supporting the development of intellectual and clinical capital across northern Australia; and
- ensuring that the system of medical education in northern Australia is accountable and cost effective.

5.2 Approaches and models

In this section various approaches that address the objectives of the consultancy and relate to the principles outlined above are discussed. This analysis takes into account the geographic, demographic and cultural diversity of the north of Australia.

While it is possible to conceive of a wide range of approaches to the delivery of medical education in this region, the consultancy has identified only three models that are structurally distinct. These models are:

- *Stand Alone Model*—a new independent medical school in the north of Australia;
- *Linear Model*—extension and consolidation of the current north–south axes between the Flinders University of South Australia and the Northern Territory Clinical School and between The University of Queensland and the North Queensland Clinical School; and
- *Distributed Model*—a medical education matrix across the north of Australia drawing on, coordinating and extending existing structures.

In the sub-sections to follow each of these models is briefly considered in turn. Their relative strengths and weaknesses are outlined. It is understood that, regardless of the eventual model chosen, there will continue to be competition between academic and research institutions in northern Australia, including local, regional, national and international competition. In the material that follows, discussion of cooperation between institutions in particular areas does not preclude competition in others. These models do, however, have different implications in terms of the nature of competition and the extent to which the resulting northern structures are able to compete on the national and international stage.

The stand alone model

This is the traditional, familiar model with a centralised focus for education and training. To date, with one exception (Newcastle), within Australia this has been capital city-based. The strengths of this model include its familiarity and relative conceptual 'simplicity'. Outside of metropolitan Australia, where attracting expertise presents enormous problems, such centralisation may itself function to facilitate the development of an intellectual critical mass that will sustain growth where the medical school is sited. It may also offer economies in terms of student support activities through the bureaucratic expediencies of centralised teaching, accommodation and administration. Clearly, also, this model would have substantial collateral benefits to the communities and regions in which a medical school might be located.

The James Cook University proposal for a medical school contains some elements of this stand alone model. It is also important to point out, however, that the proposal from James Cook provides for a multi-campus medical school with features akin to some of those of the distributed model discussed later in this section.

The stand alone model replicates the traditional structure of tertiary education in Australia. In a time of rapid social and technological change such models are being challenged internationally and in Australia. Historically, it has provided poorly for populations outside of metropolitan centres and its relevance must be further questioned in settings, such as the north of Australia, where the population is widely distributed, and when educational techniques and technology have provided the means to take education to students rather than being reliant on the reverse.

While conceptually the most simple of the three models, this approach, at least at the outset, would have the greatest resource implications. It would require the construction of training facilities, infrastructure support and a major investment in attracting preclinical and clinical teaching expertise. This model would require, whether situated in north Queensland or elsewhere (for instance, in Darwin as was suggested in the submission to this consultancy from the Northern Territory University), that the entire range of general and specialist teaching capacities and the entire bureaucratic structure of a medical school be available at a north Australian site(s).

While a traditional version of this model would clearly bring medical education to the north, if such an institution were to provide for the wider northern Australian population, it would still entail substantial disruption and costs in relocating students other than those in the immediate vicinity of the university. For others,

the economic or social implications would be similar to those incurred by students who currently move to metropolitan centres for their training. Because of the highly specialised and technical nature of certain medical disciplines, which are unlikely to be adequately replicated outside of major urban centres, it is also likely that a northern Australian institution would remain dependent on southern institutions in order to ensure students were provided adequate exposure to such fields. Furthermore, the capacity of this model to attract students *to* northern Australia, either from metropolitan centres to the south or internationally, might be limited. In an era of increasing inter-institutional collaboration and competition for both resources and students, a new stand alone institution would have great difficulty developing a national profile and reputation. With prestigious universities in the south, its capacity to attract international students would be limited. Furthermore, with Newcastle University providing an excellent and innovative program for indigenous students nationally in an existing stand alone institution, it is also unlikely to provide additional benefits for indigenous students save, perhaps, for those residing close to the north of Australia campus.

This model would require either the creation of new medical school places or a significant reallocation of current places. Considerable thought should be given to the design of admission processes that would result in rural, remote and indigenous students gaining entry to the medical school. Wherever the medical school is sited, or whatever admission process is used, any reallocation of places from southern medical schools would be likely to be vigorously contested. In addition, the identification of one north Australian centre as the primary site for a medical school would almost certainly fuel interstate tensions regarding the allocation of educational and health resources.

In summary the major benefits of the stand alone model would be that:

- it would replicate existing models;
- recurrent costs would be moderate;
- it would concentrate expertise and intellectual capital in a northern centre; and
- it would support the development of a critical mass of intellectual capital on one site.

The major problems of the model would be that:

- it would be focused on one State or Territory;
- it would replicate existing centralised structures and centralised intellectual capital;
- start up costs would be high;
- it would require creation or reallocation of medical school places; and
- it may create institutional/state rivalries.

The linear model

The linear model involves the parallel extension of existing medical education initiatives from the Flinders University of South Australia to the Northern

Territory and from The University of Queensland to north Queensland, as well as the initiatives undertaken by The University of Western Australia in the north of that state. The Northern Territory Clinical School and the North Queensland Clinical School constitute an early stage in the potential development of this model. As indicated in Section 3, in 1998 the Northern Territory Clinical School has its first cohort of students from the graduate entry course at Flinders University. In 1999 the first groups of graduate entry medical students from The University of Queensland will undertake year three and four studies while permanently based in the north. The linear model envisages an extension of these initiatives through collaboration with the Northern Territory University and the Menzies School of Health Research in the Northern Territory, The University of Western Australia in that state, and with the James Cook University in north Queensland. The further development of these initiatives with increasing involvement of local universities would ultimately allow for the delivery of all years of the respective medical school courses in the north of Australia. The review of the North Queensland Clinical School provides an example of this model in an early stage of development.

This approach would require that existing northern universities extend their range of basic and medical science courses. While responsibility for the medical course would be gradually devolved to the respective northern institutions, formal associations with the southern medical schools would be maintained, thus providing both support in the north and access to facilities in the south that are not reasonably replicated outside of metropolitan centres. This system would potentially prove less difficult in terms of the reallocation of student places and in terms of state sensitivities to the privileging of one state in the stand alone model. Building on existing relationships and structures, this model would not incur the same heavy start up costs of the stand alone model. However, providing all four years of a medical course in the north, along either or both axes, would still demand a major financial commitment.

The linear model would thus have the benefit of building on existing resources in moving towards increased autonomy in the northern sites while maintaining close working relationships with the major universities in the south. Nevertheless, this would still require replicating various facilities in the northern clinical schools. While not as extensive as would be necessary for a stand alone facility, it would still be substantial. Furthermore, for this to occur along both the Flinders University–NT axis and the UQ–NQ axis, there would necessarily need to be new resources across both of these two systems in the north. Thus while there are certain efficiencies to this model, when viewed from a north Australia perspective, it would entail a degree of duplication *within* the north which, given the population base, might not be necessary or sustainable.

A further feature of the linear model as an end point is that, in terms of the populations served by the respective Northern Territory and north Queensland facilities, each may be considered as a satellite stand alone facility, thus incurring some of the disadvantages of the centralised stand alone model.

In addition, the prospect of two clinical schools in northern Australia, each providing an entire graduate medical course, raises questions about the long term viability of such a system, which would involve competition as well as duplication. While this approach would continue to lend the prestige of the respective southern universities to the clinical schools in the north, and would serve to increase the

awareness of southern institutions about the north of Australia and its health issues, it is unlikely that this arrangement would produce a north Australian institution of medical education with a national or international profile.

Thus the benefits of a linear model would be that:

- it would build on existing structures;
- close links with major institutions in the south would be maintained;
- start up costs would be moderate; and
- recurrent costs would be moderate.

The problems with such a model would be that:

- there would still be a centralised site in the north with centralised intellectual capital;
- there could be duplication of resources in the north; and
- it might compromise the development of institutional recognition and reputation.

The distributed model

The three models presented here may be considered as a continuum. The linear model has developed as a northern satellite extension of the stand alone metropolitan institutions. The distributed model, which is described in greater detail in the following chapter, is an extension of the linear model. It builds on existing resources with limited disruption of the structure and expertise that has been developed in the region to date. However, in terms of ultimate structure and function it is a more radical departure from existing approaches to medical education.

The long term vision for this model is influenced by the trend towards the formation of educational consortia and decentralisation of tertiary education occurring across the wider education sector nationally and internationally. Rather than attempting to create a campus within north Australia, this approach seeks to develop northern Australia as a campus for high quality medical education. Precedents for cooperation at this level within health education include that of The University of Queensland, Griffith University and the Queensland University of Technology in the delivery of the Masters of Public Health (MPH) course, the recently negotiated consortium of The University of Queensland and four Victorian universities to deliver the Corporate MPH for the Commonwealth and the cooperation between the Menzies School of Health Research, the Northern Territory University and Flinders University in the delivery of MPH programs. Arrangements for conferring degrees vary in the three examples. A defined quantum of course work at the degree granting institution is required in the first case in contrast to the second where this is a rotational arrangement between the participating institutions. All three arrangements not only foster cooperation across defined areas but also allow for continuing competition between participant institutions in other areas.

There is international precedent for cooperation of this kind. In the United States the Universities of Washington, Alaska, Montana State and Idaho participate in the WAMI Program which distributes the components of the medical education program throughout the region. Importantly, there is some evidence from the first seven years of the program that a greater proportion of WAMI graduates practised in rural areas after graduation than the proportion of all United States doctors practising in rural areas (Adkins et al 1987).

In essence, in the distributed model, the north of Australia is considered a single zone which, while diverse in many ways, has certain characteristics that differentiate it from the rest of Australia. In this model all aspects of medical education—teaching, students and clinical resources—would be distributed across the zone. It is both patient-focused and student-focused, addressing the clinical needs of patients and the learning needs of students where they are most relevant: in the environment in which problems develop and are treated. In this sense this approach would be particularly well suited to problem-based learning, which forms the foundation for the current graduate entry medical courses at both Flinders University and The University of Queensland.

The model is so named because the resources for teaching would be distributed across the zone. This would reduce duplication within the north and allow for areas of existing expertise to develop as centres of excellence and resources for the zone as a whole. However, just as there are already various facilities in northern Australia with significant reputations for high quality work and teaching, for instance in public health, this model would not preclude the continuing development of more than one centre in a particular field but would, rather, build on existing expertise and encourage cooperation. Existing areas of acknowledged excellence include epidemiological expertise at the Menzies School of Health Research in Darwin, the basic sciences facilities and infectious disease experience at James Cook University together with the public health expertise in the Anton Brienl Centre, remote community medicine capabilities in Central Australia which will be strengthened by the joint University Department of the Northern Territory and Flinders Universities, rural medicine at the North Queensland Clinical School in Townsville and indigenous mental health in Cairns. Other regional centres also have the potential not only to serve as learning centres but to develop particular areas of training expertise.

Students in the distributed north of Australia campus would have a set of training sites and a wider matrix of learning nodes scattered across the zone. Learning in training sites would derive from local resources, access to expertise in particular fields not available locally through electronic communication links within the zone and beyond, and by an increased investment in mobility of staff and students. This would, of course, entail ongoing costs in terms of developing and supporting the necessary technology and providing for travel. The former will be offset by the parallel requirements of state health authorities and other educational institutions across the north of Australia.

This model would demand cooperation across institutions, sectors and states. The potential difficulties of such an arrangement for which, as noted before, there are precedents would be reduced by the involvement of all major parties. Not only does this mean that none would be excluded from partnership in a major development in the north of Australia but, as this arrangement would add value to the educational capacity of the north, all would have interest in an educational

initiative of national and international standing. Furthermore, this model is likely to result in less immediate contestation with other medical schools over the allocation of student places. The distributed school could begin with students currently studying in the north from the three metropolitan schools and build up a small number of extra places over a number of years if required in negotiation with the Commonwealth. These could come from existing medical schools or through extra places created as a result of the abolition of the TRD scheme. In any event, the number would be small. There would be a considerable potential to attract full fee-paying overseas students.

The degree of cooperation required between the partners should not be underestimated, however. There would need to be continuing contributions from the state/territory health departments for a distributed medical school to function, and local identity and decision-making would need to be accommodated. There would also need to be clear procedures for equitable allocation and management of resources among the consortium partners. None of these considerations would provide insurmountable problems but they would require some detailed consideration by and agreement between the partner institutions

In summary the benefits of the distributed model would be that:

- start up costs would be moderate;
- it would be student-focused;
- it would reduce duplication across the north of Australia;
- it would decentralise education and build intellectual capital across the region;
- it would support smaller centres to develop their own field of expertise; and
- it would foster a unique north of Australia identity in medical education with supportive north-south links.

The major problems with the model would be that:

- it is unfamiliar and untried;
- governance and control would be complex;
- it would require excellent cooperation across institutions and states; and
- recurrent costs are potentially high.

5.3 Summary

Table 1 provides a summary and comparison of the models according to essential criteria. Further information is provided on the distributed model in the next section.

Table 1 Essential characteristics of the three models

	Stand-alone	Linear	Distributed
Disrupt current practices	significant	minimal	minimal

	Stand-alone	Linear	Distributed
Flexibility of planning	no	yes	yes
Growth	sudden	incremental	incremental
Start up costs	high	moderate	moderate
Ongoing costs	moderate/high	moderate/high	possibly high
Duplication of resources	yes	moderate	moderate
Centralisation	yes	partial	no
Intellectual capital	centralised	decentralised	distributed
Capacity to compete	limited	moderate	substantial
Institutional/state tensions	considerable	moderate	minimal
Need for cooperation	minimal	moderate	considerable

6. The distributed model

6.1 Introduction

While the distributed model of medical education in the north of Australia offers a number of advantages in reduced start up costs, potential for cooperation among institutions and distributing intellectual capital across the region it is, nonetheless, a complex model requiring both commitment and resources by the partner universities, the relevant Commonwealth departments and state health services. In this section of the report further details of the proposed model are set out to provide some directions that may guide future support. It is worth reiterating that, although the model does require additional resources both human and financial, it is regarded as the end-point of a continuum of the three models and, in particular, builds on some of the existing cooperative and collaborative initiatives associated with the linear model.

6.2 Partners and contributing organisations in the distributed model

Under a distributed model a university consortium would be established to run a North Australia Medical School. The member universities would be the three metropolitan universities with interests in the region (The University of Western Australia, The Flinders University of South Australia and The University of Queensland) and the two major local universities (Northern Territory University and James Cook University). Other options could include a smaller consortium concentrating on the Northern Territory and north Queensland or the additional involvement of The University of Newcastle, with its strong indigenous medical education program, in the consortium. Indeed, the comprehensive submission from The University of Newcastle to this project proposed approaches to medical education in the north of Australia which are akin to those of the distributed model.

Other north Australian health education organisations would also be involved in some form of partnership with the North Australia Medical School, including the Menzies School of Health Research, Batchelor College and the University Departments of Rural Health at Geraldton, Alice Springs and Mt Isa. The latter are involved in establishing partnerships with health education and service providers such as Aboriginal Medical Services, the Royal Flying Doctor Service, Rural Health Training Units, Divisions of General Practice and Offices of the Training Program of the Royal Australian College of General Practitioners.

The state health services, the Health Department of Western Australia, Territory Health Services and Queensland Health, should also play a key role, especially in the provision of funding for appropriate and relevant clinical placements for

medical students. There were comments made in both the verbal and written consultations associated with this project that clinical staff in the north of Australia already carried heavy workloads that made time allocation for teaching activities difficult. For example, the submission from the Mackay District Health Service and the Mackay Base Hospital indicated that it would be 'very difficult to promote teaching at the undergraduate level in areas outside of the capital cities as the specialist staff involved in the teaching have such a high clinical workload'.

The recruitment and retention of high quality specialist and generalist medical staff is important for the success of the model. The opportunity to participate as a university staff member or gain clinical academic status may provide an incentive for retention of staff. Nevertheless, there should be a commitment from the health services to provide resources for clinical service and clinical teaching in conjunction with the university partners.

There are already examples of cooperation and collaborative ventures between the major groups that could be involved in a North Australia Medical School. Some of those applying to the teaching of the Master of Public Health are set out in the previous section. Other examples of joint work include:

- cooperation between the three existing medical schools and the state health services in Western Australia, Northern Territory and Queensland;
- cooperation between Flinders University and The University of Queensland through the Consortium of Graduate Entry Medical Schools;
- cooperation between Flinders University, the Northern Territory University and the Menzies School of Health Research in the Cooperative Research Centre in Aboriginal Health and in the establishment of the University Department of Remote Health in Alice Springs; and
- cooperation between local partners in the establishment of the University Departments of Rural Health in Geraldton and Mt Isa.

The University of Queensland has strong links with clinical services in the north through the North Queensland Clinical School. The University of Queensland and James Cook University signed a Memorandum of Understanding in 1992 for cooperation in teaching and research. As was indicated earlier in this report, despite recent tensions between the two institutions, collaborative relations between certain disciplines have been established.

6.3 Organisation, curriculum management and accreditation of the North Australia Medical School

A distributed North Australia Medical School, while effectively owned and run by a university consortium, would need to establish a central planning and organisational structure with a visible presence in the north of Australia. The consortium should appoint a dean with a small number of curriculum management and support staff. Some senior science and clinical staff might be appointed to play key coordination roles. The bulk of the administrative teaching and research

activities would come from the existing staff in the member universities, supported by a small number of appointments where necessary. The latter would be located across the north of Australia and in the metropolitan centres of Perth, Adelaide and Brisbane.

The central planning group should be responsible for the preparation of a curriculum for the medical school and the development of an accreditation database for the Australian Medical Council (AMC). The course should meet the standard requirements set out by the AMC. The basic sciences could be built upon the strengths of the two local universities. The visit by members of the project team to James Cook University revealed strengths in physiology, microbiology, immunology, social and behavioural sciences and in NMR/ESR imaging. Northern Territory University has the capacity for the delivery of arts, social sciences and a range of science units. The local resources would be supplemented by the expertise in the metropolitan universities in areas such as anatomy, clinical biochemistry and pharmacology that are currently not represented in the northern universities.

The curriculum would be given a distinctly north Australian focus, throughout all years, by the involvement of key groups such as the Menzies School of Health Research, Batchelor College, the Faculty of Aboriginal and Torres Strait Islander Studies at Northern Territory University, the Anton Brienl Centre and School of Australian Indigenous Studies at James Cook University, as well as the University Departments of Rural Health and centres of clinical specialisation.

Through these groups considerable expertise can be assembled in areas such as:

- population and public health;
- tropical medicine;
- indigenous health;
- cultural awareness;
- remote health;
- community health, general practice;
- multi-disciplinary primary health care; and
- specialist services in diabetes, renal and cardiovascular medicine, emergency medicine, evacuation and retrieval.

These could be supplemented by expertise existing within the metropolitan partners in specialist areas and in services provided within larger teaching hospitals.

Initially, students should be located in a small number of nodes in the larger towns and cities in the north. Their basic sciences education would be provided in these nodal centres using materials and staff from local resources and supported by information technology and flexible delivery learning materials from the metropolitan universities according to need. Both the graduate entry courses at the Flinders University of South Australia and The University of Queensland involve early clinical contact and the vertical and horizontal integration of basic sciences and clinical education. Students enrolled in the North Australia Medical School would have clinical contact from the very beginning of the course and maintain that contact throughout the program. As the students move through the course

there would be increasing clinical experience leading to student internships in the final year, but some exposure to the basic sciences would be maintained throughout the course.

The clinical experience would consist of some rotations through the larger teaching and regional hospitals in the north but much of the students' education would be gained in community-based experiences and in centres of excellence and specialisation in the region. Elective choices in the final year might allow some students to undertake rotations in metropolitan clinical settings as needed.

The task of the central management group would be to keep track of the students' learning, monitor student and staff movement, review assessment and quality control and ensure that students were meeting the requirements of the course as laid down in the accreditation provisions. The participating universities would need to strike agreements about the conditions under which they would grant degrees. There could be joint degrees or single institution degrees granted by the university in which the majority of studies was undertaken. As is indicated in the previous chapter, there is some experience in different approaches to this issue among potential consortium partners.

6.4 Curriculum design and support issues

Admission of students

As indicated in Chapter 3.4, two of the universities in the proposed consortium have graduate entry medical courses: The Flinders University and The University of Queensland. The University of Western Australia has a six-year school leaver program but has joined with the Universities of Adelaide, Melbourne and Newcastle in using interviews and test scores for entry. The advantages to be gained from adopting graduate entry procedures are set out in Chapter 3.4 and include ability to determine the criteria for entry and increased ability to attract mature students from a diversity of backgrounds.

There are additional advantages to be gained from adopting a graduate entry approach in the distributed model, including:

- facility to include the demonstration of commitment to working in the north of Australia as part of interview procedures;
- greater flexibility to include quotas for rural and remote and indigenous students;
- opportunities to support rural and remote and indigenous students in gaining knowledge and skills for entry in the senior years of high school and through their first degree programs;
- increased opportunities for universities located in the north of Australia to design and implement first degrees that would prepare students for entry to medical school and that could be articulated with the medical degree by giving credit for the first year of studies; and

- facility to attract students to move to the north of Australia to undertake first degrees at local universities.

Both Flinders University and The University of Queensland would bring expertise to the consortium in the design of admission procedures for graduate entry courses using a combination of test scores, previous tertiary experience and interview scores. The University of Western Australia uses interviewing for admission and is collaborating with other Australian medical schools in the use of the Undergraduate Medicine and Health Sciences Admission Test (UMAT). This approach, too, allows for the possibility of greater flexibility in admissions, the inclusion of demonstration of commitment to work in the north as part of the selection process and the ability to designate special quotas for rural and remote and indigenous students. The potential thus exists for the North Australia Medical School to adopt a parallel track approach into four-year graduate entry or five or six-year school leaver programs as is being established at The University of Melbourne.

Further options for admission could be through specifically designed pre-entry degrees offered by local universities for which some credit could be given in the medical degree and perhaps for some candidates in the pre-entry degrees to be guaranteed entry into the medical course. These options are set out in the review of the North Queensland Clinical School. The consideration of all these options could lead to the adoption of a series of flexible entry points to the course. While it may be administratively complex, such a system would enable a diversity of student backgrounds to be represented in the course and allow one of the underlying principles of the admission process to be addressed: to attract and retain local students, indigenous students and those from remote areas.

Teaching and learning strategies

Again as indicated earlier, both Flinders University and The University of Queensland have adopted problem-based learning in their graduate entry courses.

The adoption of problem-based learning would bring certain advantages in curriculum design and delivery in the North Australia Medical School, particularly as the approach does not depend on specialised staff delivering material to students on a face-to-face basis. As is discussed in Chapter 3.5, in problem-based curricula students learn in groups using specially prepared cases. The learning is facilitated by trained tutors who are not necessarily experts in the field of study. Thus scientists, general practitioners and specialist and non-specialist clinicians are used as tutors. Expert staff in the areas of study are involved in case writing, providing supporting lectures and acting as resource persons. This approach to learning could be readily adapted in a distributed approach to medical education. This would be achieved by:

- preparing and writing of cases within the consortium universities using a combination of specialist and local expertise;
- using trained 'non-expert' tutors to facilitate learning from the cases at the designated sites throughout the north of Australia;
- training tutors through the existing programs in the member universities and/or with a team attached to the central office of the North Australia Medical School; and

- delivering specialist support for the cases through flexible learning approaches and the use of information technology.

Problem-based learning of this nature could be extended into the clinical years of the course and make use of patient encounters in the institutional and community-based settings throughout the north of Australia. It would bring together a well-recognised approach to student learning in medicine with the advances brought about by access to state-of-the art information technology.

Students would experience a range of teaching and learning strategies, including bedside and ward round teaching and patient encounters in the clinical years. The experiences in community-based settings and centres of specialisation would allow the development of new experiences in continuity of care, education in ambulatory settings and increased patient-based learning. There would be close contact and mentorship opportunities with staff in the clinical settings who would interact with fewer students than in many metropolitan settings. Most Australian universities offer medical education students rotations in rural areas and rural doctors have proved to be good teachers.

In the distributed model students would spend the majority of their time in these settings. Support for students in communication with their peers and other staff and in access to library and database resources would be available through information technology media.

Information technology and flexible delivery of student learning

The flexible delivery of learning materials for students is now an important priority in all Australian universities and it is shown in Chapter 3.6 that it has been an important factor in the support of student learning in the Northern Territory and North Queensland Clinical Schools. Flexible delivery offers new capabilities for support of distance education and for students to gain access to learning resources at their own locations in their own time and at their own pace. Community-based approaches to medical education have been advocated for sometime but it is only since the advent of effective information technology media that such programs can be considered seriously. The distributed model would rely heavily on flexible delivery of learning through information technology.

As discussed in Chapter 3.6, flexible learning strategies commonly embrace the following media:

- interactive print-based materials;
- World Wide Web-based resources;
- electronic communication;
- CD-ROM and interactive, computer-driven multi-media resources;
- video-conference and tele-conference communication; and
- system programs for managing flexible delivery and interactive learning.

Through flexible delivery students at distant sites can have access to a range of text and visually-based resources 'online' and there is less need to duplicate expensive facilities such as advanced anatomy laboratories over several sites.

There are at least three ways in which the use of information technology could significantly enhance medical education in the distributed model. Electronic mail would allow for effective communication among students and between students and staff. Students in off-site locations would not have to lose contact with the medical school or their peers. The second advantage is that lecture presentations could be delivered 'live' through video-conferencing. Thirdly, world wide web and database resources would allow students access to many sources of information and, finally, quality images, video segments and expensive resources could be digitised and made available at remote locations.

The use of information technology and flexible delivery in the North Australia Medical School would provide major support for the problem-based learning process in the ways indicated previously. It would also provide support for many other aspects of the program: in access to library resources and databases for evidence-based medicine in clinical settings and in monitoring and quality control of student learning and assessment over distributed clinical sites.

All universities in the proposed consortium have experience with flexible delivery and the use of information technology in delivering programs.

The Northern Territory University has a Centre for Teaching and Learning in Diverse Educational Contexts and James Cook University has a Centre for Interactive Multi Media. As is shown in Chapter 3.6, information technology is used in the medical courses at Flinders University and the University of Queensland. In the latter case the problem-based cases and supporting materials are delivered to students by Internet and intranet. Video-conferencing is used to deliver parts of the Flinders course to Darwin and a cohort of students undertaking the whole of year three in the Riverland region of South Australia. There are existing programs to upgrade information technology links between the Flinders University, the Northern Territory University and the Northern Territory Clinical School and between The University of Queensland and the North Queensland Clinical School. Other networks are being established through the University Departments of Rural Health.

Nevertheless, excellent information technology infrastructure, both hardware and software, and flexible delivery expertise will be essential for the distributed medical school. The central planning and management team should have access to resources and expertise in this area in order to successfully implement the medical education program. Any move towards a distributed model would need to be accompanied by investment in infrastructure and staff development. Staff development in information technology was identified as a priority in the Review of the North Queensland Clinical School.

The central planning and management team of the North Australia Medical School should have access to resources and expertise in information technology and flexible delivery to successfully implement its medical education program. Investment in these areas would have considerable flow-on effects in the provision of clinical services and many of the developments could take place in cooperation with state health authorities.

6.5 National and international standing

The distributed model offers an opportunity to develop a 'best practice' medical school curriculum based on the strengths and experience of the consortium members and the collaborating organisations in the north of Australia. It would feature:

- flexible entry points to the course with opportunities for special entry schemes and support for rural, remote and indigenous students;
- use of the problem-based learning process supported by experts from the member universities and collaborating organisations;
- use of local staff as trained problem-based learning tutors;
- support of problem-based learning, clinical education and other teaching and learning through use of information technology and flexible delivery methods;
- support for monitoring and quality control of the program at distributed sites through advanced information technology;
- opportunities for a variety of clinical and community placements throughout the areas of expertise in the north of Australia together with access to placements in specialist metropolitan centres for short periods of time if needed;
- facility to gain sound advice on the priorities of medical care in the north of Australia, such as public health, indigenous health and tropical medicine, and to build them into the very structure of the medical course; and
- ability to contribute to workforce needs in the north of Australia by recruiting local students, attracting others to the area and providing them with a rigorous, relevant and satisfying medical education.

This would provide a model for other medical schools to follow, both nationally and internationally. The development of capabilities in information technology and flexible delivery would allow the program to be extended beyond national boundaries and attract overseas full fee-paying students. It is recognised that both the Northern Territory University and James Cook University already have strong links with their near geographic neighbours. The distributed model would allow for the marketing of the program through existing links but with the strengths of potentially five Australian universities, three of which have established and well-recognised medical schools. The program could be offered to overseas students in a mixed mode where they may be able to take significant proportions of the programs in their home countries with support of the North Australia School. This would not only bring an important source of funds to the new school but also would allow it to develop as a significant force in innovative medical education in Australia and overseas.

7. Conclusions

7.1 The preferred option

This consultancy has identified three models that may be developed to deliver medical education in the north of Australia. Each model has potential strengths and weaknesses. Each reflects a distinct pattern of growth of Australian medical education. The stand alone model is replicative; a new institution in the model of the old. The linear model is incrementally expansive; cooperatively extending medical education through bilateral north–south arrangements. The distributed model is an example of mutualistic growth demanding a multilateral investment in medical education and the creation of an innovative decentralised and student-focused approach to education in an area that presents enormous challenges and, potentially, rewards.

It is the view of the project team that the distributed model provides the best option in meeting the original goals of this project namely to investigate:

- how the medical schools of The Flinders University of South Australia and The University of Queensland can together (using advanced delivery technologies) ensure the best provision of medical education and medical care in the north of Australia; and
- whether other tertiary institutions in the region can be usefully involved in this provision and, if so, how.

The model builds on the strengths provided by the participation of The Flinders University of South Australia and The University of Queensland in the Northern Territory and North Queensland Clinical Schools respectively and expands the existing opportunities through the use of flexible delivery and information technology. Additionally, it provides a meaningful way to involve other tertiary institutions and centres of excellence in the region.

The distributed model would allow for the development of a ‘best practice’ and competitive medical school with moderate set up costs, with reduced contestation about student places in the first instance but with higher recurrent costs, particularly to support information technology and flexible delivery.

The adoption of the model would also foster the development of intellectual capital and contribute to workforce needs in the region through the unique north Australia curriculum, flexible admission processes, up-to-date teaching and learning strategies and diversity of hospital and community-based clinical placements.

As was indicated in Chapter 1 this report is one of three recently completed reviews, each of which has had as its subject one of the three models identified by this consultancy:

- A report has been prepared by the North Queensland Medical School Working Party for the Commonwealth and State Ministers of Health. It has investigated

the proposal from James Cook University to establish a new medical school. It thus addressed the stand alone model, albeit as indicated previously, with some elements of the distributed model.

- The Review of the North Queensland Clinical School for The University of Queensland has described the linear model in evolution.
- The project reported here for the Department of Education, Training and Youth Affairs (DETYA) has drawn attention to an alternative distributed model.

The Project Team considers that it is imperative that these three reports be reviewed together and their implications considered carefully. Clearly, which ever model is favoured there will necessarily be a further long process of consultation, research and planning, probably more so with the less familiar distributed model. Indeed, the major recommendation of this report is that a detailed feasibility study of the distributed model be undertaken. The study should focus on costs, technology requirements, governance, student places and timing, as well as taking in the views of major stakeholders on the three models. This will enable detailed assessment of the three models to take place.

7.2 Recommendations from project

Accordingly, the recommendations of this project are that:

1. A system of medical education be established in the north of Australia that will enable students to undertake all or a majority of their studies in situ and will be responsive to the health care needs of residents of northern Australia.
2. A distributed model based on a consortium of metropolitan and local universities, including The University of Western Australia, the Northern Territory University, The Flinders University of South Australia, James Cook University, The University of Queensland and other universities with relevant expertise, and with cooperation from other health organisations in the north, be adopted as the preferred model for medical education in the north of Australia.
3. A study of the feasibility of this option should be conducted and should include:
 - a detailed costing of the distributed model compared with the other two models;
 - development of a blueprint for the technology that would be required;
 - governance and the allocation of responsibility between the universities and the central conducting authorities;
 - provision of student places;
 - timing; and
 - views of the major stakeholders on the merits of the three models.

Appendix A

Letter to stakeholders

Dear «Title» «Surname»

Re: Provision of Medical Education in the North of Australia

The Flinders University of South Australia (FUSA) and the University of Queensland (UQ) are undertaking a joint project to examine the provision of medical education in the north of Australia. The project is being funded by the Department of Education, Training and Youth Affairs (DETYA) under the Health Education Innovation Programme.

Project Aim and Organisation

The aim of the project is to identify and evaluate alternate approaches to the provision of medical education in the north of Australia using existing medical education provider arrangements and innovative delivery models. The outcome of the project will be a recommended short list of options to DETYA (including costs and benefits).

The project team comprises:

- Associate Professor David Prideaux and Professor Nick Saunders (FUSA);
- Professor Ernest Hunter and Professor Bryan Campbell (UQ); and
- Mr Tony Loan (KPMG).

Tony Loan is managing the project.

The project team reports to a Steering Committee comprising representatives from DETYA, Education Queensland, NH&MRC and the Territory Health Services. The project is to be complete by the end of May, 1998.

Current Arrangement of FUSA and UQ

FUSA and UQ each has a clinical school in the north of Australia that provide a range of clinical experiences in hospital and community settings for senior medical students (ie. those in the last two years of their four year programs). Flinders Clinical School is located in Darwin and Alice Springs; UQ Clinical School is located in Townsville, Cairns and MacKay. A group of students is based for the last two years of the course in each of the clinical schools and there are opportunities for additional students to travel from Adelaide or Brisbane to spend shorter periods of time in the clinical schools. Educational programs are provided by local clinicians and are supported by delivery of material from a distance using

teleconferencing and e-mail. Other medical schools place individual students in northern Australia for short elective or rural placements.

Your Input to the Project

The project team would like to hear your views about the current arrangement for delivery of medical education in northern Australia and how they may be enhanced. It is to be noted that in formulating our advice to DETYA, we are seeking to build on existing arrangements for medical education by encouraging partnerships and joint venture arrangements between existing medical schools and tertiary institutions. We are also seeking to enhance the attractiveness of such collaborative arrangements by involving the use of innovative delivery technologies such as teleconferencing, telemedicine and e-mail.

In particular, the project team would be interested to hear your views about how the current arrangements are meeting your needs and how they could be enhanced to:

- attract rural students from northern Australia;
- retain these students in northern Australia upon completion of their training;
- attract and retain indigenous students;
- increase the level of medical expertise and activity across northern Australia;
- develop centres of acknowledged expertise across northern Australia; and
- contribute to the intellectual climate of health care in northern Australia.

In suggesting enhancement of the current arrangements at FUSA and UQ, you may want to consider:

- the set up costs involved;
- the ongoing financial commitment of medical resources for teaching and training purposes;
- the demands made of existing education and health care providers; and
- the demands made of students.

Options for change of the current arrangement might include:

- enhancement of flexible (distance) delivery arrangements in years 3 and 4 of the medical course, with or without local expert support;
- wider distribution of student placements within northern Australia, with greater use of additional regional centres (eg Katherine, Mt Isa) and/or extended community placements;
- provision of all four years of medical education in northern Australia in collaboration between FUSA and UQ, and/or involving other tertiary education institutions in the region. This could include articulation of the current 4 year graduate entry medical programs at FUSA and UQ with a first (biomedical) degree offered by a northern Australian partner (or partners); and

- extension of special entry arrangements for students who reside or have completed a first degree in northern Australia, including indigenous students (such arrangements currently exist for entry of Northern Territory residents into the FUSA program).

Submissions

The project team would like to receive your views in writing by **Friday, 13 March 1998**. You can e-mail, fax or mail your responses to:

Mr Tony Loan
KPMG Health Care & Life Sciences
GPO Box 2499
Adelaide SA 5001
Phone: 08 8236 3296
Fax: 08 8236 3395
E-mail: adelheal@kpmg.com.au

Please feel free to contact Tony Loan to discuss your submission or to clarify the intent. Once we have reviewed the submissions, we will contact interested parties to explore their proposals further. We propose to make visits to northern Australia and Western Australia in mid to late March, so if you are interested in meeting, please indicate in your submission.

We consider this project provides the opportunity for stakeholders in medical education to not only provide their views about the need for medical education in the north of Australia, but also to develop viable approaches to its provision. We look forward to hearing your views.

Yours sincerely

Tony Loan
Project Manager

Appendix B

Persons & organisations replying to stakeholder letter

Mr P Plummer, CEO, Territory Health Services

Dr Robert Stable, Director-General, Queensland Health

Undergraduate Medical Education Committee, The University of Queensland

Dr Bob Brown, President, Queensland Branch of Australian Medical Association

Dr Ross Brandon, Regional Director, Central Australian Region, Territory Health Services

Professor Ron McKay, Vice-Chancellor, Northern Territory University

Dr Ben Ewald, Medical Director, Central Australian Division of General Practice

Professor John Mathews, Menzies School of health Research, Northern Territory

Dr John Erlich

Director of Clinical Training, Central Australia Region, Territory Health Services

Dr John Edgar, Director of Medical Services, MacKay Base Hospital, Queensland

Dr Chris Horsfall, Director of Clinical Training, MacKay Base Hospital, Queensland

Dr N Williams, Director of Medical Services, Alice Springs Remote

Dr H Sadlier, Director of Emergency Department, MacKay Base Hospital, Queensland

Mr Pat McCarthy, Manager, Northern Zone District Coordination Unit, Queensland Health

Professor Louis Landau, Dean of Medicine and Dentistry, Faculty of Medicine and Dentistry, The University of Western Australia

Puggy Hunter, Chairperson, National Aboriginal Community Controlled Health Organisation

Dr Richard Larkins, Dean, Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne

Dr King, Medical Superintendent, Royal Flying Doctor service, Queensland

Dr Jeremy Hayllar, Director of Medical Services, Mount Isa Base Hospital and Community Health Services

Dr Chris Kennedy, District Manager, Townsville District Health Service

Professor Bruce Dowton, Dean, Faculty of Medicine, The University of New South Wales

Dr Peter Mudge, Clinical Dean, North Queensland Clinical School, The University of Queensland

Professor Peter Yellowlees, Area Director, Valley Integrated Adult Mental Health Service, The University of Queensland

Appendix C

Persons and organisations consulted during site visits

Northern Territory

Territory Health Services

Mr Peter Plummer, Chief Executive Officer

Mr Karen Williams, Assistant Secretary, Health Planning and System Support

Dr Len Notaras, Medical Superintendent, Royal Darwin Hospital

Dr Ross Brandon, Regional Director Central Australian Region

Northern Territory University

Professor Roan McKay, Vice Chancellor

Professor Charles Webb, Pro-Vice Chancellor, Higher Education & Research

Professor Greg Hill, Dean Faculty of Science

Associate Professor June Mason, Associate Dean, School of Health Sciences

Professor Jenny Watson, Professor of Clinical Nursing and Research.

Menzies School of Health Research

Professor John Mathews, Director

Ms Catherine Henderson, Business Manager

North Territory Clinical School, Flinders University

Professor David Brewster, Clinical Dean

Western Australia

Professor Max Kamien, Professor of General Practice, Department of General Practice, The University of Western Australia

Dr Jane Talbot, Department of General Practice, The University of Western Australia

Professor Landau, Dean of Medicine and Dentistry, Faculty of Medicine and Dentistry, The University of Western Australia

Dr Greg Down, Director, Western Australian Centre for Remote and Rural Medicine

Ms Noelle Jones, Manager, Human Resources Division, Australian Medical Association

Australian Capital Territory

Mr John Anderson, Rural Health, Commonwealth Department of Health and Family Services

Ms Joy Russo, State Financing, Commonwealth Department of Health and Family Services

Ms Ann-Maree Hanratty, GP Branch, Commonwealth Department of Health and Family Services

Ms Ann Boer, Information Technology Group, Commonwealth Department of Health and Family Services

Mr Conrad Gershevitch, Office of the National Health & Medical Research Council

Mr Robert Wells, First Assistant Secretary, Office of the National Health & Medical Research Council

Queensland

Dr Robert Stable, Director-General, Queensland Health

Professor Richard Hays, Professor of General Practice and Rural Health, The University of Queensland

Professor Michael Humphrey, Department of Obstetrics and Gynaecology, North Queensland Clinical School, The University of Queensland

James Cook University

Professor Bernard Moulden, Vice-Chancellor

Professor Rhondda Jones, D/Vice-Chancellor

Professor Norman Palmer, Pro-Vice-Chancellor, Research and International

Professor Ian Wronski, Executive Dean, Faculty of Health, Life & Molecular Sciences

Professor Robert Porter, Medical Planning Dean, Faculty of Health, Life and
Molecular Sciences

Professor Eric Wainright

Mr Kent Adams

Mr Ron Store

Dr Janet Greely

Mr John McKinlay, Librarian

Ms Jacinta Elston, Anton Breinl Centre