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Abstract
The Australian School of Advanced Medicine (ASAM) at Macquarie University is developing innovative postgraduate training programs that will require the Library to respond in new ways. ASAM is the first Australian medical school to be linked to a private hospital on a University campus where it uses progressive educational theories and advanced technologies not found in other Australian medical schools. This paper, prepared by an ASAM clinician and two librarians, narrates the first stage of the development of a model to meet the information needs of ASAM researchers, students, clinicians and educators.

Objective: To explore and develop a new Library service model for ASAM that incorporates principles of lifelong learning, competency-based assessment, teamwork and patient-centred care.

Methods:
- Examine existing methods of providing services by reviewing the literature and contacting institutions with successful programs
- Explore clinical librarian models to improve patient care.
- Develop criteria to assess Scholars’ competence in locating, evaluating and using information
- Investigate new technologies to facilitate information access and support learning
- Identify how liaison librarians might expand their role into new collaborative endeavours

Results: Our findings so far are providing ways of meeting ASAM’s information needs through flexible learning environments and point-of-need individualised support. Innovations already underway include an embedded information literacy skills program and a clinical librarian service. Educational and clinical partnerships are facilitating learning, research and patient care.

Conclusion: Our study will culminate in recommendations for an ongoing service model to be trialled in the new School.
Introduction

Libraries are about information and surgery is about action: it’s a powerful combination (John Cartmill, Professor of Surgery at ASAM, personal communication, April 2009)

The Australian School of Advanced Medicine (ASAM) at Macquarie University in Sydney is breaking new ground in postgraduate medical education. ASAM is the only Australian medical school providing post-fellowship training in surgical sub-specialties. It is the first Australian medical school to be co-located with a private hospital on campus. Macquarie University has not previously provided medical education so the Library faces challenges in meeting clients’ information needs within this new environment. ASAM students (Scholars) and teachers (Advanced Scholars) are surgeons with busy schedules and sophisticated information requirements that set them apart from other undergraduate and postgraduate Library clientele. ASAM’s philosophy is based on the Mayo Clinic model of education and reflects worldwide changing principles of medical education.¹ Competency-based, lifelong learning, collaboration and patient-centred care are evolving principles requiring new Library services. This paper narrates the development of a Library service model for ASAM from a clinician and librarian perspective. Of particular importance are the exploration of a clinical librarian service, information literacy assessment and the crucial role of teamwork and collaboration at all stages of this exploration.

The Project

There is opportunity in any new project that gives fresh ways of doing things a chance. Established departments in older Universities can become set in their ways and resources are just not available to innovate. Macquarie University has opened itself up to a new hospital and specialist training school and it feels as though the entire University is keen to help; to make what they do best available. (John Cartmill, April, 2009)

ASAM began in temporary premises on campus in 2007. Construction of the Medical School and adjoining hospital is near completion and openings are scheduled for 2010.² Our previous paper provides details of ASAM’s early development.³ Initially only a couple of surgeons were enrolled in training programs and approximately ten research students undertaking PhD neuroscience studies. The School has since accepted more researchers, Scholars and Advanced Scholars with a predicted maximum of fifty Scholars each year. ASAM’s information needs are increasing as the School expands and more programs are implemented. As liaison librarians for ASAM, we began visiting Scholars and Advanced Scholars in temporary premises providing assistance with Library resources and services. We conducted user needs surveys and interviews during 2007 and 2009. Scholars’ and Advanced Scholars’ experiences and expectations of Library services provide useful planning information. For example, many clinicians are unaware of the range of information resources such as Scopus and Meditext. Advanced Scholars often do not have time to conduct their own searches and are sometimes unaware of alerting services they could use.
Macquarie University has one interdisciplinary Library centrally located on campus with expanding electronic and remote access to resources. ASAM’s requirements for anywhere, anytime specialised information has compelled us to find more tailored ways of delivering resources. User feedback from our surveys led to the initiation of a Library project in early 2009 to explore and develop a Library service model for ASAM. The project, funded by ASAM and the Library, enables us to spend 2.5 days each per week investigating potential service models from mid-April until September 2009.4

Initiatives

Key Library initiatives so far have been an embedded information literacy skills program for Scholars and a clinical librarian service to facilitate patient care. Collaboration between the Library, ASAM and other Macquarie University academics has been crucial to these successes.

Lifelong Learning

Recent changes in Australian health care and medical education have led to increased medical graduates but insufficient postgraduate training opportunities in the public health system. Expansion of medical education into the private health realm has been recommended to create more training positions.5 ASAM’s educational role will enhance our medical workforce as postgraduate training opportunities are provided within its new private hospital, Macquarie University Private Hospital.

One of the strategies of our school is to welcome excellent surgeons, some of whom may have limited academic experience…none the less it is their practical skills and surgical wisdom that we value. Mary and Karen help to introduce them to the extraordinary advances in medical literature management that have been occurring. (John Cartmill, April, 2009)

Models of medical education incorporating lifelong learning, teamwork and competency-based assessment are being adopted worldwide to replace traditional rote learning and time-based evaluation.6 ASAM’s philosophy of independent lifelong learning is supported by sociocultural learning theories that recognize effective learning takes place in collaborative groups where members learn from each other.7 Within this environment, Vygotsky’s zone of proximal development (ZPD) denotes the distance between the actual level of development and the potential level of development that can be achieved through collaboration with more capable colleagues.8 “Learning can be said to occur when assistance is offered at points in the ZPD at which performance requires assistance”.8 In this context the librarian becomes a facilitator of learning by offering guidance as and when required. Principles of ZPD predominate at ASAM where all Scholars and Advanced Scholars are regarded as learners who work together and learn from each other. The importance of co-learning is stressed by the Dean of ASAM: “Expert neurosurgeons are no less life-long learners than novice neurosurgeons, and they need each other
to achieve the best clinical and educational outcomes and continue to improve on these outcomes".\textsuperscript{9}

Our exploration of ASAM’s information needs highlighted the importance of competency-based assessment within a community of lifelong learners.\textsuperscript{3} As information literacy facilitators, we need to create learning environments that enable Scholars to achieve required outcomes whilst developing a commitment to lifelong learning and enquiry. ASAM’s program requires Scholars to demonstrate a level of competency in specific skills and knowledge before moving to their next stage of learning. For example, during the Master of Advanced Surgery program, there are two points at which Scholars are required to conduct a literature review as part of the write-up of the patient’s case: firstly, when they have seen a patient in the consulting room, and are writing up the patient’s problem, management options and the justification for deciding on an option; and secondly at the point when the patient is discharged from hospital. In consultation with ASAM’s Head of the Centre for the Advancement of Medical Education we developed performance assessment criteria (based on the Association of College and Research Libraries’ (ACRL) standards)\textsuperscript{10} that assess each Scholar’s competency in searching and evaluating the literature relevant to their case study.\textsuperscript{11} The searches are documented and include Scholars’ reflections on their value. We assess each search using a checklist, rating scales and individual feedback. Small Scholar numbers and the nature of their sub-specialty studies provide the opportunity to embed literature searching skills development and assessment in ways we have not seen in other institutions. Assessment thus becomes a powerful means of feedback that drives learning.

Scholars are expected to know when to ask for assistance with searching the literature. The small number of enrolments enables us to provide individual guidance although group instruction is held when appropriate, for example, as Endnote updates are required. Scholars may be quite proficient in searching Medline or PubMed. However, there are usually areas where individual assistance is a powerful learning tool. Literature searching and assessment are repeated, with guidance from a librarian, until mastery is achieved. Scholars’ written feedback and informal interviews indicate that availability of individual help in literature searching has been beneficial. ASAM’s enrolment will never exceed fifty and at this stage, with approximately eight Scholars, individualised help is feasible. However, as Scholar numbers continue to increase, along with librarians’ responsibilities, one-to-one assistance may need to be supplemented with more sustainable approaches such as online learning modules and group support.

**Clinical Librarian explorations**

Clinical librarian programs in Australia and overseas usually recognize the librarian as a member of the clinical team to provide quality-filtered information for health professionals at their point of need.\textsuperscript{12} The clinical librarian literature suggests this service is valued by clinicians but can be difficult to sustain or extend.\textsuperscript{13} This was evident during our visits to other Australian institutions. Cimpl Wagner & Boyd\textsuperscript{14} and Winning & Beverley\textsuperscript{12} note the lack of any objective evidence for positive impact of clinical librarian services and recommend further systematic studies. During our visits to other clinical librarian programs we were advised to find a “champion”, a
clinician who would support and promote our service among clinical staff. At ASAM we are fortunate to have a number of champions who see a role for us at meetings, ward rounds and even in the operating theatre. When the proposal of a clinical librarian service was initiated by the Dean of ASAM we hoped that the small number of clinicians requiring assistance from two librarians would facilitate more successful outcomes than other less well resourced programs had achieved. The Dean suggested we attend the clinicians’ “reflective practice meetings” at a private hospital where Scholars and Advanced Scholars practise. Meetings rotate between Journal Club, research presentations, audits and neuropathology. Initially we took turns to attend and were sometimes asked to carry out literature searches to answer questions. The searches were carried out later and results emailed to the Dean. We quickly learned the value of becoming a visible and familiar face at every opportunity and consequently our search requests increased. After a few weeks we were asked to attend the neuroradiology meetings held after reflective practice and then accompany the Dean, Advanced Scholars and Scholars on ward rounds. During rounds we receive search requests that are often crucial to patient care. Search results are emailed to clinicians and discussed at subsequent reflective practice meetings. Scholars and Advanced Scholars value these searches and suggested we compile a database where they can be accessed as required and periodically re-run for updates. The creation of a collection of ASAM’s clinical evidence for selected sub-specialties would be a useful point-of-need tool for Scholars, Advanced Scholars and hospital staff.

During ward rounds, including ICU, we are included in team consultations at patients’ bedsides. Discussions have included specific treatment options, new therapies and concerns about a prognosis. Our participation in team discussions enables us to learn terminology, place a search request in context and, where required, clarify a search with the clinician immediately. Clinicians’ feedback indicates they appreciate timely searches that enhance patient care. We believe our search results are more relevant when conducted in this context. For example, on a recent ICU round we were asked to investigate whether impartial studies had been carried out on a new neurosurgical stent. This was a matter of urgency as the results of our search would determine if a critically ill patient could benefit from immediate surgery to insert the stent. We had the advantage of being on the round and able to clarify aspects of the query with the clinician, thereby saving valuable time when we searched the literature. However, our capacity to continue this level of support will be tested as the School grows and more clinicians request help with their queries. The Dean of ASAM describes potential benefits of the clinical librarian service:

*It is beneficial if it impacts medical decision making or has produced a research benefit. Interactive, direct communication with the Library is preferred over time-delayed communication where the Library reacts passively to questions. Evaluation of the service is difficult to quantify but if it benefits patient outcomes then we can justify it.* (Michael Morgan, Dean of ASAM, oral communication, 8th May 2009)

Attendance at reflective practice meetings facilitates other collaborative endeavours. We conduct literature searches to inform the updating of hospital protocols and participate in meetings convened to draft protocols. We have participated in the School’s hospital accreditation process demonstrating to assessors how Library
services and resources are provided for ASAM, thereby making us valuable members of the healthcare team.

*Not only have the Librarians sharpened my skills they have been generous with their own specialised skills so that they are available for special challenges. Mary and Karen come regularly to rounds but they are also available for “once off” requests. They are not merely available but seem to relish any question. They are as comfortable among information as I am among guts.* (John Cartmill, April, 2009)

The clinical librarian service could be further developed. We have joined John Cartmill, a colorectal surgeon, in the operating theatre where the crucial role of team communication and collaboration among theatre staff can be experienced firsthand. Learning experiences incorporating zone of proximal development principles abound here as the experienced surgeon supports and guides the learner surgeon until mastery is achieved. We meet patients during ward rounds prior to their surgery and appreciate being part of the team providing the full circle of care when we become temporary members of the theatre team. This level of involvement also enhances our learning as we acquire knowledge and understanding of procedures, workflows, terminology and patient communication that will improve the information support we provide for ASAM. For example, John asked us to conduct searches related to these patients and present the results at subsequent multidisciplinary team meetings. As members of the clinical team we can more readily anticipate and meet clinicians’ information needs even before being asked for help. The importance of patient education and empowerment is a vital aspect of patient-centred care. Our theatre and ward involvement has initiated possible ways of providing relevant, authoritative information for patients in collaboration with their clinicians. Theatre attendance has enhanced our understanding of clinical team and patient perspectives, yet is time and labour intensive. We would recommend this level of participation on an occasional basis only, for example, every six months.

**Partnerships and teamwork**

Our work with ASAM creates valuable partnerships within the Library, across campus and beyond.

*The library plays a central role to the University. At Macquarie this central role is “built in” with the Library literally at the centre of the campus. I made good use of this when Mary and Karen suggested they help me to meet similar minded academics from other departments within the University, informally. This is not part of any organisational chart, it’s about opportunity and the excitement of shared ideas and, as unlikely as it might seem, it’s about the Library. At least one of these chats has lead to a successful grant application. Karen and Mary are facilitators, connectors, they help make things happen.* (John Cartmill, April, 2009)

Library-wide communication and collaboration with a range of staff has evolved as our support of ASAM grows. We work closely with Liaison Librarians from other disciplines as we expand the Library’s collection of medical resources available also to non ASAM academics. We organise vendor demonstrations and trials of resources that are relevant to other Liaison Librarians and academics. For example,
ASAM, Psychology and Linguistics share areas of interest within the University’s neuroscience research centre. We have become information brokers as we introduce ASAM clinicians to other Macquarie University academics as described above by John Cartmill. During our visits to other institutions we met Terence Harrison who leads a successful clinical librarian service at Royal Melbourne Hospital. Later, visiting our Library, Terence gave an informative talk on evidence-based practice that was relevant for many Library staff and academics. A sharing of experience and knowledge through these collaborations is a potential outcome of our work with ASAM.

**Current technologies and flexible learning spaces will create new service opportunities**

Communication will take place within a wireless environment throughout the new hospital and School. Electronic patient records and i-phone technology could enable us to provide Library resources at the point of need. We will investigate ways of developing an ASAM repository of primary electronic material, such as DVDs of operations. Library-supplied information resources could be incorporated into vodcasts and plasma screens. We already participate in a researchers’ wiki with our own Library News page for updates and links to our regular Heath Sciences Newsletter. The wiki is an effective means of communicating with researchers who spend extended periods of time in their laboratories.

There will not be a branch library of medical resources within ASAM. Resources will include Macquarie University Library’s physical collection and remote access to electronic information. However, Scholars and Advanced Scholars require ready access to key texts and monographs which may only be available in print format.

*It might seem like a small, even trivial thing, but each of us clinicians has moved to the School with several boxes of books. Precious monographs and texts that in some cases have been handed down from our teachers and survived the culls from office to office. These books have a value that is enhanced by recognizing them as a library.* (John Cartmill, April, 2009)

Advanced Scholars will be encouraged to make their book collections available in the School. An interest in having key titles catalogued for Scholars’ use has been expressed. Whilst a branch library will not form part of a future model, selected titles catalogued into an EndNote library from which book lists are periodically generated would provide increased awareness of available resources.

Flexible learning spaces within the School will enable us to respond quickly to Scholars’ and Advanced Scholars’ information needs. We will have a flexible librarian space in the Scholars’ Lounge where we can conduct individual consultations or group sessions. Plasma screens will be used to deliver information throughout the School and Hospital. We will continue to work with Scholars and Advanced Scholars at their workstations and beyond as required.
The next stage

During the project planning phase we documented potential challenges including available time for the project, other workloads, staff capacity for backfill, funding and space constraints within ASAM’s temporary premises. Throughout the project’s implementation, we have been noting issues that could change the course of our planned activities. For example, our Liaison Librarian responsibilities extend to other disciplines and clients apart from ASAM. As our project progresses, we have been able to share some of those responsibilities with our backfill librarian.

This narrative has outlined initiatives that will be pivotal to our success in building a new service model. During the initial phase of our project we have been gathering evidence and exploring possibilities for a future model. For example, we are considering ways of extending the clinical librarian service which has received positive feedback from clinicians. Should we offer some appraisal or ranked level of evidence with search results as recommended by other clinical librarian programs? Is there value in becoming more knowledgeable about specific clinical areas as recommended by the Informationist model? In what ways would this improve our searches and how might we acquire the knowledge?

The next phase of our project will require us to analyse and evaluate our body of evidence to provide a rationale and justification for our services, taking into account ASAM’s philosophy and Library resources. For example, our attendance at a weekly ward round during the first two months of the project generated 10 questions from 5 clinicians. Each question took an average time of 4 hours to answer. This early stage of our involvement in rounds created an estimated 5 hours’ searching work per week. At this rate, as the expected number of ASAM clinicians doubles in 2010, our search time would increase to 10 hours per week for a full time librarian. This estimated growth in requests has also been recognised by the Dean of ASAM. We would need to develop a rationale for the ward rounds we attend, types of searches undertaken and the clinicians requesting searches to create a sustainable librarian workload.

We are aiming to develop a model that “integrates the best external evidence with individual clinical expertise and patients’ choice.” Whilst our model recognises the importance of using the best available evidence, it does so in collaboration with clinicians’ expertise and patients’ preferences. Lifelong learning skills, competencies of the clinical team and principles of patient-centred care will be guiding tenets of our future service model.
References


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