

Developing a health information systems approach to a novel student health clinic: meeting the educational and clinical needs of an interprofessional health service

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Abstract

This paper addresses the use of information management systems and IT capability to design and manage a university student teaching clinic in the Western suburbs of Melbourne. The clinic technology team had three main briefs, to support student learning and professional development, to provide quality health care to the community and to develop systems and platforms that facilitate the ability of the clinic to meet National Safety and Quality Health Standards (NSQHS). This paper highlights the role of health information systems in delivering on a clinic capable of these goals.

The provision of skilled and experience workers for health care systems is a core goal of University health sciences programs. Research into student led clinics indicates they provide an effective health delivery model and deliver strong satisfaction score with patients, positive health outcomes [1] and improved student learning [2]. Innovations in health policy and education over the past decade have swung the operation of student led clinics towards the newer approach to health care provision known as Interprofessional Practice (IPP). The World Health Organisation (WHO) has identified IPP as a focus for health education worldwide [3]. This model may be a particularly appropriate fit with the Australian health system and training clinics as rates of chronic illnesses such as heart disease, diabetes, cancer, arthritis and mental illness become our greatest health needs [4].

In meeting both educational needs of students and clinical care needs of the community, University training clinics exist in a space between educational and healthcare worlds. In a recent consultative enquiry of 20 Australian and New Zealand clinics, Allan and colleagues [5] identified the tension between meeting the academic needs of the students engaged in the clinical service and providing appropriate and professional services to the community. The students need to experience and learn is sometimes discordant from the patients need for care, thus raising ethical dilemmas [6]. To further complicate these management issues, the regulatory environment in Australian health care system has changed significantly over the last decade in response to a new Health Records Act [7], the Information Privacy Act [8] and movement towards accreditation of health services through national and state level health service accreditation and recording requirements. A survey of the university sector indicates that most institutions are erring on the side of being student clinics that serve the public as their emphasis, with no University based student training clinic in Australia currently holding accreditation such as the National Safety and Quality Health Care Standards that are considered best practice standards for use in health services [9]. The purpose built VU IPEP clinic structure supports both clinical and student needs where small interview rooms or treatment spaces are linked technologically to assessment pods where as many as ten students engage in healthcare planning and learning activities. This new style of clinic and clinical practice is an example of a best practice health service and health education innovation.

1. Design of the Health Information System for an IPEP task

Health information systems are viewed as central to improving the overall quality, safety and efficacy of health systems [10]. It is evident that as health care systems manage more complex and chronic illnesses that require multiple health fields to collaborate that information management systems plays a hidden but fundamental role in the ability to provide quality and safe health care for patients. In the VU IPEP clinic, the further addition of teaching and educational needs complicates the functionality requirements of the technology used in a typical clinic, therefore requiring tailoring of information management systems that move beyond specifically addressing clinical needs to incorporate educational solutions.

The IPE Clinic was designed and built to incorporate modern features found within ambulatory care centres, super clinics, hospitals and community health centres. The design aims to facilitate the professional learning continuum, enabling students to communicate interprofessionally in engaging in shared care and providing more coordinated services to clients. In designing the information technology systems, initial requirements were captured from the academic team and refined as clinical staff joined the project. Finally, consultation was sought from legal and accreditation bodies to validate and refine final requirements. These consultations led to two

parallel themes regarding the clinic information management systems. The first requirement was to develop the technology to support the clinical practice. This included AV streaming for collaborative and remote consultation/supervision and securing a client management system which would support student led client sessions by including an approval mechanism for progress notes and which would incorporate the Service Coordination Tool Templates (SCTT) from the Victorian Department of Health [11]. The SCTT is a standardized package of assessments recommended for use in health care contexts by the Victorian Department of Health. They provide both the foundation information required by the clinical service but also information on disability and recovery that are equally important for provisional health staff to familiarize with best practice standards of reporting.

The second requirement of the information management systems was to support student learning, including the ability to record client sessions and to securely manage and control access to the recordings. This required a balancing of the needs between educational with the ethical and privacy needs of a clinic that is using national accreditation with the NSQHS as a benchmark for professional practice. The discussion of the needs analysis for both these issues and the solutions built into the health information systems policies and structure highlight the challenges of structuring the information management systems of a complex service in a way that maximizes usability and outcomes and protects valuable data.

2. AV Streaming and Recording

2.1 Learning and teaching capability via AV streaming:

To support learning and teaching, active collaboration, and connectivity between non-clinic locations (e.g. classrooms and offsite supervisors), all treatment and assessment rooms within the clinic are fitted with Audio-Visual (AV) conferencing systems. This technology allows practitioners in assessment rooms to conference in practitioners from other disciplines located in workrooms within the clinic. The nature of IPE means that up to 10 practitioners could be involved in an initial consultation (at the same time) or ongoing client treatment – rather than have all 10 present in the one room, streaming (aka video conferencing) is used to link multiple rooms. Building on from this, the scenario may arise where consultation with a supervisor external to the clinic may be required. This raises the need for AV streaming between health and University settings as well as within the clinic itself. Table 1 presents the needs analysis conducted across different stakeholder groups to develop an AV system that worked for multiple parties whilst maintaining privacy and health record management standards.

Table 1: Needs Analysis: AV Streaming

Student learning	Clinic management	Patients/Carers	Privacy/ regulatory
Ability to view high quality streaming video content, with permission, of assessment and treatment sessions in progress from locations within the clinic	Provide high quality and consistency of data streaming Ability to provide streaming from assessment pods, treatment and consultation	Ensure Patients/ Carers provide informed consent to having their image and audio transmitted to other clinic rooms Ensure that patients can request streaming of their session to be suspended or stopped	Compliance with the Privacy and Data Protection Act [12]. Health Records Management Act (2002) in relation to sharing information protocols.

Ensure informed Consent is evident from Client / Student/ Supervisor	rooms Incorporation of patient consent procedures into streaming access	Ensure informed consent is evident from carers, family, health workers included in assessments and treatment.	NSQHCS accreditation compliance. Focus on standard 1, 2 and 5.
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Although streaming from treatment rooms will primarily need to be controlled by policy and process and through education of students and supervisors, a number of technical safeguards have been put in place to support this. Video conferencing can only take place between VU conference rooms and/or VU users using Microsoft Office Communicator (this will enable staff to connect from remote sites via the VU VPN service). Where the call is initiated externally to the treatment room, the caller ID of the room/person dialing in will be displayed on the control panel in the treatment room and a ringtone will be audible – this will alert both practitioner and client to the incoming call and the practitioner will have the ability to accept or reject the call. This assists with maintaining the presence of informed consent as the client can observe the clinician or as treatment team provide access to the streaming.

2.2 Digital Asset Management System (DAMS) Capability

As well as allowing for live streaming of sessions to other rooms/sites, capability to record sessions has also been enabled allowing the use of recorded materials in classroom and teaching contexts at the University. The DAMS ~~system~~ allows for the distribution of high quality and editable clinical recordings of assessment and treatment session recordings to authorized University teaching staff both within the clinic and in the wider University setting. In addition, within the clinic these recordings provide a component of the client's clinical file (and are stored alongside consent documents), thus requiring secure storage and future accessibility based on freedom of information requests.

To maintain confidentiality and ensure informed consent, sessions are only recorded when written informed consent has been provided. In addition, patients and families may remove consent for recording during the course of a session or following a recording process. In order to comply with legislative [12] and accreditation guidelines regarding privacy obligations and compliance [11], the procedure for access and approval for use of recorded data is tightly monitored and controlled using information technology infrastructure and clinical policy documents.

The process of recording sessions begins with a student or clinician having to enter a authorization and password in order to record sessions. The system design also requires patient identification number for data management purposes and identification of the session as clinically or research based. As a final acknowledgement of importance of informed consent, students and clinicians are required to check this box on the room AV Touch Panel. Recorded sessions are securely encrypted and transferred from local storage in the clinic to the VU data centre and into VU's Enterprise Content Management system (Oracle Webcenter Content). File access is through the ECM environment when a senior authorized clinical staff member will ensure ethical fidelity through inspecting the informed consent for the recording, assessing if consent was removed and ensuring there were no other circumstances present that would indicate the file should not be viewed by clinical, research and academic staff. Clinical and research records are segregated to ensure confidentiality and the academic and research staff are

responsible for the use of this data in accordance with the University teaching and research guidelines. At no time are these recordings released directly to students for use without a thorough review and authorization beforehand from clinical and academic staff.

Recorded content is maintained within the ECM platform in accordance with policies governing patient records and information. For legal and regulatory compliance reasons, academic staff will not have the ability to delete content from ECM. If content is no longer required it will be marked for archiving or disposal. Archived content will not be searchable or viewable by academic or clinical staff who are not authorised.

3. Practice management and Clinic Health information's Systems

Best practice health services are engaged in constantly improving practice to provide better patient care and health service practice. This focus on excellence in health care practice has rarely been discussed in relation to university based training clinics. In order to provide appropriate and timely patient clinical data, a practice management software package was selected from a variety used in medical practices across Australia. The health client management system eAlth (eAlth.net) was selected as the vendor showed a commitment to work with Victoria University to enhance their software to meet the specific needs of the IPEP Clinic. The software was specifically selected as it has the capacity to include clinical notes approval, multiple practitioner booking for appointments and the capability to incorporate the Victorian Government Service Co-Ordination Tool Templates [11]. The SCTT is a suite of standardized templates designed to facilitate service co-ordination and facilitate shared care within and between service providers. This template package will be rolled out through the client management software as it provides the qualitative and quantitative data required to measure performance against six of the ten NSQHSS [9]. The provider meeting this need was a major determinant of selection as the SCTT provides a platform for accreditation and best practice and specifically requires users to embed the templates directly into the practice management software.

4. Network Segregation

University students have access and use an extensive array of information technology and social media. This raises unique concerns when considering patient privacy and confidentiality issues [13]. In response, the clinic is developing clinical practice guidelines for the appropriate use of social media in health services based on legal, ethical and professional implications. Based on these findings and with intensive stakeholder engagement within Victoria University academic, legal, information security and clinical staff, guidelines around privacy in general and access to clinical information have been developed.

In support of these guidelines, the IPE Technology team has developed a network segregation design to isolate clinical software systems and facilities from the wider University network as well as allowing the clinical team to restrict the level of internet access students have whilst on placement at the IPE clinic and to support and maintain the privacy of client records/client information. A whitelist only approach has been taken, where only an agreed upon list of categories of web content are allowed, supported by the clinical governance framework to review and amend the list as needed. Being mindful of the needs of the students to access other content whilst on placement, access to the general Victoria University network has also been enabled for students at hot desks or through their own personal devices in student common areas within the IPE clinic. All students on placement will be provided access to devices to

enable them to carry out daily activities. This includes capture and review of patient documentation, accessing external content and resources (e.g. MIMS medicine information catalogue), capturing content via a touchscreen device (paperless clinic). These devices can only access the IPE clinic network and therefore while they can access the client management software, they will be subject to the restrictions put in place via the network segregation design.

5. Conclusion

This technology use and tailored client management software will ensure that students gain 'real world' experience of documenting information into practice management software and complying with the best practices associated with accredited services. In turn, patients will have less need to repeat their histories and medical issues as interprofessional assessments and the Service Coordination Tool Template information are at the student/clinicians disposal in real time. The move to an interprofessional service approach has meant developing an interprofessional clinic that provides students with a quality education in an emerging health care model. In addition, the clinic must act in accord with the highest ethical standards and professional practices. The management information systems used to assist in managing these competing demands provides a unique opportunity for the VU IPEP Clinic to be the 'best of both worlds'.

References

1. Ponto, M., Paloranta, H., Akroyd, K. (2011). An evaluation of a student led health station in Finland. *Progress in Health Science*, 1(1), 5-13.
2. Meah, Y.S., Smith, E.L., & Thomas, D.C. (2009). Student-run health clinic: Novel arena to educate medical students on systems based practice. *Mount Sinai Journal of Medicine*, 76(4), 344-356.
3. Gilbert, H. V., Yan, J., & Hoffman, S.J. (2010). A WHO Report: Framework for Action on Interprofessional Education and Collaborative Practice. *Journal of Allied Health* 39(S1): 196-197.
4. AIHW (2012). *Australia's Health*, 13. Cat. no. AUS 156. Canberra: AIHW.
5. Allan, J., O'Meara, P., Pope, R., Higgs, J., & Kent, J. (2011). The role of context in establishing university clinics. *Health and Social Care in the Community*, 19(2), 217-224.
6. Christakis, D. A., & Feudtner, C. (1993). Ethics in a short white coat: the ethical dilemma that medical students confront. *Academic Medicine*, 68(4), 249-254.
7. Health Records Act (2001). *Victoria Parliament, Australia*
8. Information Privacy Act (2000). *Victoria Parliament, Australia*
9. Australian Commission on Safety and Quality in Health Care (2011). National Safety and Quality Healthcare Standards. <http://www.safetyandquality.gov.au>
10. Chaudhry, B., Wang, J., Wu, S., Maglione, M., Mojica, W., Roth, E.,...Shekelle, P.G. (2006). Systematic review: Impact of health information technology on quality, efficiency, and costs of medical care. *Annals of Internal Medicine*, 144, 742-752.
11. Victorian Department of Health (2012). Service Coordination Tool Template, <http://www.health.vic.gov.au>
12. *Privacy and Data Protection Act (2014). Victoria, Australia*
13. Cronquist, R. & Spector, N. (2011). Nurses and social media: Regulatory concerns and guidelines. *Journal of Nursing Regulation*, 2(3), 37-40.