

Case Study: Bayview Regional Health Centre

Overview. Bayview Regional Health Centre (BRHC) was established in 1998 in Apollo Bay in the Barwon Southwest region of Victoria, initially starting as a small clinic. Managing directors, Dr. Emma Clarkson and Dr. Jason Morelli founded the clinic with the vision of providing comprehensive healthcare in a rural setting. Due to significant growth in services and patient volume, the clinic has expanded into a facility comparable to a small hospital. Today, the health centre serves over 120 patients daily, offering a range of services including inpatient care, outpatient clinics, and home visits. BRHC also offers telehealth consultations intended to reduce the burden on rural patients by providing remote healthcare. The service is saving rural patients on long and expensive trips to a doctor's office for simple services such as issuing scripts for prescribed medicines.

Health Information management systems.

At the core of BRHC is its clinical information management system, Medilink. Medilink has been operational since 2006 and manages a wide array of patient and administrative data, including:

- Patient records: personal details, demographics, medical history, treatment plans, medication lists, and allergy information.
- Scheduling for appointments and consultations telehealth consultations and appointments with the clinic's allied health professionals.
- Management of prescriptions and medical reports for electronic transfer
- Coordination of patient referrals, hospital admission requests, and diagnostic orders as well as discharge summaries.
- Direct electronic file exchange of clinical and non-clinical information
- communication of patient information via email as required.

The centre ensures a searchable patient call-history is documented for every telehealth appointment, anticipating the possibility of future need. Patient safety stands as the practice's top priority. Medlink facilitates efficient prioritisation of patient visits, sometimes it is necessary to create patient records and file notes on the fly, manually. Importantly, patient care is never compromised, and any paper-based records generated are scanned monthly and incorporated into the system.

Medlink manages patient administration, including the maintenance of call records, visit history, and health insurance details. This encompasses information for automatic payment or rebate services through the HICAPS system for private health insurance and the Medicare system for public patients. It also manages records of doctors and allied health professionals, including their demographics, qualifications, specialties, and ongoing training to ensure accurate patient matching.

Medlink was initially developed by a software company based in Melbourne almost two decades ago. Since then, BHRV's own Justin Hayes, a local software developer, who was involved in the original setup, has been managing the system. He has been instrumental in managing and maintaining Medilink software, database, and servers. However, the system, now running on almost 20 years of "patches, extensions, and workarounds", faces

challenges in keeping up with rapidly changing systems requirements and development. Additional functionalities such as the direct file exchange and HR extension, which were not included in the original package, have also been plagued with numerous issues. When rural doctors and allied health professionals encounter issues accessing the system, they often resort to sending patient consultation results via email or fax. Similarly, nurses who conduct home visits to remote patients often need to download patient data onto their tablets to record visit details.

The availability of accurate, confidential information is essential for facilitating good clinical practice; the continuity of patient care, support for point-of-care decision making, monitoring of critical events, and measures for preventing clinical incidents and information errors are critical. The Centre Manager, Susan Davis, oversees all patient records. While she is slightly concerned about granting all employees access to patient data at any time, she believes that the convenience of delivering focused and personalized care, prioritized by the clinic, outweighs the risks associated with information sharing.

Compliance to standards. Bayview Regional Health Centre has been diligent in complying with Australian standards for health information and records management. BHRC's recordkeeping aligns with the medical record-keeping requirements of the Medical Board of Australia and Victoria's health record documentation and data capture procedures. BHRC aims for mostly full compliance with the Australian Commonwealth Government's national privacy principles.

BHRC acknowledges the importance of handling sensitive patient information with care, emphasizing the need for patient consent and the protection of confidentiality and privacy. While planning to incorporate these principles into a forthcoming Data Care Mission, BHRC has not yet drafted a mission statement. Despite believing its systems are compliant, the last audit was conducted pre-COVID, and subsequent audits have not been maintained, leaving a decade of records unaccounted for. The original Medilink contractor cannot act as the independent auditor, with the executive management team responsible for maintaining records and ensuring compliance.

Due to rapidly changing system requirements, detailed documentation on how the system operates has been deprioritized. Clinic staff, including front office personnel, the practice manager, the managing accountant, the accounts reconciliation officer, HR and payroll manager, allied health professionals, nurses, GPs, specialists, and the managing doctors, are trained only on system parts relevant to their roles and encouraged to adopt a hands-on approach.

IS/IT Infrastructure. Liam Park, a young IT Network and cybersecurity student and part-time IT specialist, was brought on board following a disruptive DDoS attack at the end of last year prompting the need for additional in-house support. However, Liam is still far from security expert, and he does not have the necessary programming background needed for the legacy system. The absence of a significant line of reporting with no direct authority adds to his challenges. Liam reports to Justin, who then often engages in informal discussions with the centre manager, Susan Davis, a longtime friend of his.

Medilink is posing challenges at the business level as well. The Accounts Reconciliation Officer, Anna Lee is responsible for inventory and supplier management (e.g. disposable syringes and needles, sterile glove, measurement device, surgical masks etc) and for depositing all banking. Anna has formed a habit of exporting and converting inventory lists and daily accounts data to CSV format so she can use Excel spreadsheets on her own laptop to place orders, reconcile accounts, and manage banking from ledgers. This practice has continued even after she had to replace her laptop, having lost the previous one at a nearby café. Despite Liam's advice against working from home on her laptop due to security concerns, Anna often disregards this due to her demanding schedule. The accounts manager, Michael Thompson, is aware of the practice but understands just how busy Anna gets and knows, at heart, she means well.

Adding to the complexity, Medilink lacks real-time batch reporting capabilities for tasks like generating inventory lists, monthly patient visits reports, or necessary account reconciliations. Instead, all aggregate information processing occurs nightly through a sequence of batch processes. Although these challenges have been brought to the attention of the Managing Directors, they perceive the issue mainly as a "tech problem" that IT guys will eventually resolve.

Sarah Jennings, BHRC's HR and payroll manager, is overwhelmed by the limitations of the outdated system. Responsible for ensuring timely payroll, she is exploring cloud technologies and Software as a Service (SaaS) to improve HR functionalities. She's in talks with Workday, to secure funding for a SaaS-based HR management solution, prioritising functionality over the location of data storage. Michael, the accounts manager, supports Sarah's shift towards SaaS and plans to propose using Salesforce.com's SaaS solutions to integrate core financial and business functions. Also, frustrated with the neglect of the legacy system, Michael sees continuing with the current system as a security risk and intends to bypass the less influential IT staffs to bring this proposal directly to the Managing Directors.

Business continuity. Despite internal issues, BHRC adopts a failover data backup strategy. All centre data, including patient records, Doctor's records, allied health professional records, suppliers' data, and all internal HR, finance, and operations records, are now backed up once per month with a small specialist company, located in nearby town providing the failover network and data backup service.

Of imminent concern. Prospects at BHRC are generally positive, but the centre's management culture has deviated from what its founders envisioned. Key departures, like Anna Lee's, have resulted in a loss of essential knowledge, with doubts about the basis of her supplier choices. Staff turnover and morale have been impacted by past pressures, and a rise in scams has compromised network security. Liam recently exposed a phishing attack targeting the practice manager, Susan, to access patient records, raising concerns about potential internal motives versus external criminal threats. Meanwhile, ongoing severe weather adds to the prevailing unease, with the threat of a major storm looming over Apollo Bay and its surroundings.

BHRC has requested your Cybersecurity report

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