Sunshine Coast
Division of Family Practice
A GPSC initiative

GPSC
General Practice Services Committee

Case Study:

The Sunshine Coast Data Integration Project

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GPSC
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Executive Summary

Context for the Data Integration Project

The Sunshine Coast Community has 38 family physicians across five medical clinics. Similar to other rural communities, physicians practice both in clinics and hospitals, but lack access to their patients' full medical records from both settings. The lack of timely access to patients' full medical records hinders health providers' ability to collaborate and provide continuity of care, and creates undue administrative burden.

About the Data Integration Project

The Sunshine Coast Community Data Integration Project supports information continuity in healthcare settings by creating one community chart per primary care patient. The purpose of the funded project was to merge five clinics' Med Access Electronic Medical Record (EMR) databases and provide physicians with access to a single medical record for each of their patients regardless of their care setting – whether in walk-in clinics, at the hospital, or in community family practices.

The project was led by a committee of five family physicians from the 38 physicians working on the Sunshine Coast. Through collaboration with Divisions, an integrated EMR would enable physicians to access their patients' information regardless of location, creating one community chart per primary care patient to support continuity of care.

Project Phases

Physicians explored different options for data integration before selecting the option of a full data merger to create a single medical file for each patient, accessible by participating physicians and team members in the community, across different practice settings. Due to multiple factors, the project work paused prior to the testing phase. This project uncovered the typical phases of a data migration project, and contributed to the development of *The DTO's Health Technology Guide: How to Prepare for an EMR Data Migration.*

Phase 1	**1. Pre-Implementation** a. Initiation b. Physician Engagement c. Planning d. Vendor Engagement	***Complete***
Phase 2	**2. Testing** a. Creation of Test Environment b. Testing & Revisions	***Incomplete***
Phase 3	**3. Data Migration** a. Implementation b. Maintenance	***Incomplete***

Key Lessons on Data Integration

Enablers

- Large-scale, community level data integration projects are enabled by the presence of **passionate and tech-savvy physician champions** within the Division. They facilitate ongoing communication with fellow physicians and sustain momentum to move the project forward.
- **Technical support** is essential to data integration work, both from:
    - Experts at the Doctors Technology Office who can translate clinical needs into technical language for EMR vendors; and,
    - Medical office assistants and physicians who are experts in their clinic's EMR processes who can help participating clinics agree on standard EMR coding procedures.
- A thriving and engaged **family physician community** helped advance this project.

Barriers

- Many physicians had **concerns about data loss and impacts to workflow** as a result of data integration.
- **Expectations for roles and support differed** between Divisions, the DTO, and Telus.
- The **lack of a defined timeline and project phases** made embarking on data integration work unclear.
- Despite all using the same EMR platform, **variations in clinic workflows** required extra discussion and negotiation in the data integration process.
- **Limited availability for meetings** among physicians with busy, multi-site was a challenge.
- Technical projects often uncover **complex problems that require time to fix** – this was part of the reason the data integration project paused in the Sunshine Coast.

Recommendations

- **Outlining the project phases** for data integration work can help set expectations and define what is required before each subsequent phase can begin.
- **Define a shared project agenda and expectations early on**, including:
    - **Goals**: what do you need and desire from the data integration process?
    - **Assumptions and fears**: what are some of your assumptions, concerns, or hesitations regarding data integration? What is the worst-case scenario outcome?
    - **Resources & capacity**: what resources does each party have to contribute to the project? What internal constraints to capacity exist?
    - **Roles and responsibilities**: what roles and responsibilities are you able to commit to, contribute to, and support over time?
- **Prepare to provide technical support** for data integration work, both between clinics, as well as between clinic staff and the EMR vendor(s). Clinics also require support for data privacy considerations.
- Those with a **system change or provincial coordination role** should consider and determine:
    - Their role in advocating and working with EMR vendors to support data integration projects;
    - How to support and coordinate multiple Divisions undertaking local or regional data integration projects; and,
    - How to support panel cleanup and EMR integration as a pathway to more proactive care, team-based care, and regional health system coordination and planning.

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About This Evaluation

This evaluation report is one of a series of General Practice Services Committee (GPSC) case studies that highlight Patient Medical Home (PMH) innovation and learning. These case studies facilitate comparative analysis with other GPSC case studies and evaluations, in order to:

- Build a provincial picture of PMH innovation and implementation;
- Support the spread of PMH innovations across communities; and
- Inform the improvement of GPSC investments, including program design and delivery.

This case study examines the PMH attributes of Information Technology Enablement, Family Physician Networking, and PMH Networking. For more information on the Patient Medical Home and GPSC evaluation, consult our website.

This case study provides specific lessons on processes, costs, governance, change management, stakeholder engagement, and sustainability of data integration work. These lessons are valuable to the Sunshine Coast Division, as well as other Divisions of Family Practice who may be considering similar data integration projects. This evaluation also aims to document the lessons learned around how different partners can effectively collaborate to support data migration projects.

Evaluation Design

The evaluation was co-designed with the division and adapted as the project evolved over time. The division, GPSC Evaluation Team, and the Doctors Technology Office (DTO), were key to identifying essential questions. The Evaluator worked with the Sunshine Coast division and GPSC Evaluation Team to determine an appropriate methodology, feasible scope and timeline, and evaluation questions.

Methods & Data Sources

The evaluation applied a developmental evaluation approach and collected data only during the project planning and engagement phases via document review, key informant interviews, and meeting observations.

Data sources included the following:

- Project documents
- Attendance (by phone and in person) at data integration meetings
- Direct communication with the Sunshine Coast Division of Family Practice
- Key informant interviews with Division, DTO and Telus

The Sunshine Coast Data Integration Project

The following section outlines:

- the underlying **need** for the Sunshine Coash data integration project,
- the **process** for a typical data migration project,
- and the **timeline and phases** of this project (i.e., the main story of this work).

Need for Data Integration

There are a number of distinct factors on the Sunshine Coast that impact the primary care system. These factors contribute to the underlying motivation for community family physicians in the Sunshine Coast Division to undertake a large-scale data integration project.

The population on the Sunshine Coast is generally older and has higher rates of chronic illness than other areas of BC. There is a higher proportion of Indigenous people, with specific health care needs, living on the Sunshine Coast than the BC average. Attachment rates are generally higher on the Sunshine Coast but a higher proportion of people access hospital services than the BC average, for both inpatient and outpatient care. The Sunshine Coast also has a higher rate of avoidable hospital care and more newborn complications than in other areas of BC.[1]

The Sunshine Coast is a closely-knit primary care community. There are 38 family physicians in the Sunshine Coast community across 5 medical clinics. All providers use the same EMR Platform, Telus Med Access. All but one of the participating family physicians have health authority privileges. Physicians working on the Sunshine Coast, like many other rural communities, practice in multiple sites, including their own private clinics, community walk-in clinics, hospitals, and remote sites such as long-term care residences and substance use clinics. These physicians see patients across locations without access to their full medical records.

The lack of timely access to patients' medical records poses a barrier to quality patient care, as the physician may not have the complete picture of a patient's medical history. It can also cause additional administrative work and coordination challenges to physicians working together to serve a patient. The participating family physicians desired some form of data integration in order to overcome these barriers to patient information and improve patient care.

Data Integration Process

The following section is an excerpt from *The DTO's Health Technology Guide: How to Prepare for an EMR Data Migration*. This guide provides a background on data migration projects and practical steps for clinics to consider before embarking on a data migration or merger. This guide, and the phases of a typical data migration project, were primarily learned through this Sunshine Coast case study.

Key terms / types of data projects

- A **data migration** is moving data from one database to another (e.g. moving from one EMR vendor to another).
- A **data split** is a type of data migration, when a physician or physicians leaves a clinic and wishes to take a copy of their patient data. A copy of the clinic's current database is made and used to start a new database at the new clinic. Any patients not belonging to the departing physicians are removed from the new database while the original database typically remains fully intact.
- A **data merger** is a type of data migration where two or more EMR databases are combined into one database on the same EMR platform, while still maintaining separate physical locations.
- A **patient transfer** is when only one or a small number of patient records need to be transferred (e.g. when one patient changes their family physician and their new physician needs a copy of the patient record).

Phases of a typical data migration project

Most data migration projects involve three phases:

1. **Pre-implementation/requirements gathering**: working with the EMR vendor(s) to set expectations and work on preparing the data for export. Includes contract signing, cleaning patient panels, ensuring the right stakeholders are at the table.

[1] BC Ministry of Health, Health Sector Information, Analysis and Reporting Division. *Local Health Area Profiles. July 2019*

2. **Testing**: the most critical phase, where the EMR vendor runs a test of the migration/merger and present the results for clinicians' review and approval.
3. **Data Migration**: where providers and the vendor advance with the "live" migration of patient data.

Phases and Timeline of the Project

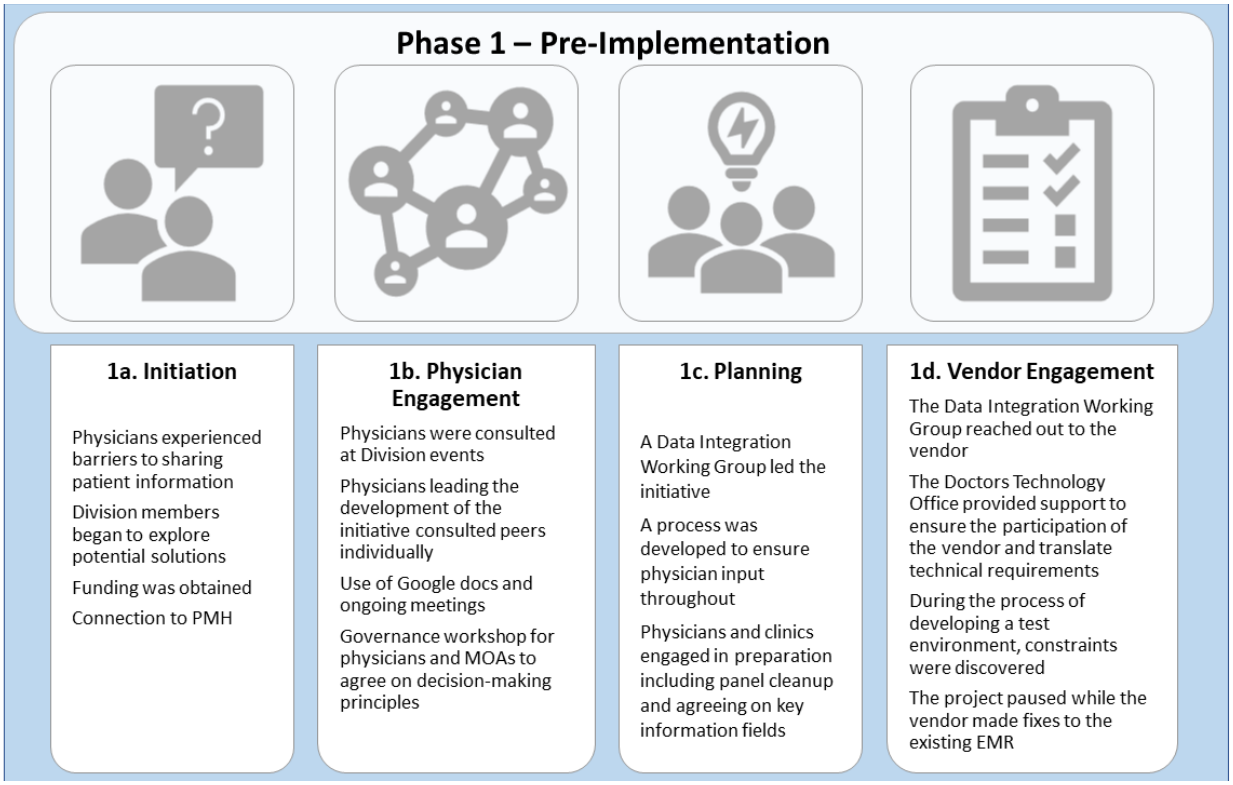
This section outlines the phases and timeline of the Sunshine Coast Data Integration Project – both the steps taken to date, as well as the remaining project work. The data integration process follows a series of phases:

Phase 1	**1. Pre-Implementation** a. Initiation b. Physician Engagement c. Planning d. Vendor Engagement	***Complete***
Phase 2	**2. Testing** a. Creation of Test Environment b. Testing & Revisions	***Incomplete***
Phase 3	**3. Data Migration** a. Implementation b. Maintenance	***Incomplete***

The Sunshine Coast Data Integration Project took place over several years, with early meetings focused on physician engagement to understand physician needs, workflow and technical requirements. Later meetings focused on developing governance models for decision-making among clinics and vendor engagement. **As of the writing of this report (Winter 2021), the project is on hold at stage 1-d: vendor engagement.**

Phase 1: Pre-implementation

During the pre-implementation phase of the project, there are four stages of work that often occur simultaneously. The stages of Pre-Implementation are detailed below, including the main work activities this project entailed.



Initiation

The Sunshine Coast Divisions of Family Practice Patient Medical Home Steering Committee began planning the data integration work in late 2016. The project was led by a committee of five family physicians, of which two family physicians were champions of the work. It was supported by the Division's Board. The Data Integration Project's mission statement was to allow physicians on the Sunshine Coast to access a single medical record for patients, in a primary care setting as well as at the hospital and in community. The project was originally funded by the GPSC through Patient Medical Home funding, and the implementation activities were funded by the Innovation Fund. As the initial work developed, the Data Integration Project was aware of, and attempted to align with, the draft BC Digital Health Strategy.[2]

Physician Engagement

During the physician engagement phase, the division consulted its family physician membership on the data integration project through formal and informal channels. The formal Division engagement took place during a formal PMH workshop and meeting with Division family physician membership. Informally, family physicians engaged in the project participated in conversations between their peers and colleagues about the work.

Planning

During the planning phase of the project, physicians from Sunshine Coast formed a Working Group to research and create a framework for a data integration process that would merge patient information from all five clinics. Several Working Group meetings were held between 2017 and 2018. The momentum of the project picked up in the later part of 2018 when Working Group members met with Telus to discuss options and started the vender engagement phase of the project. It was expected that the project would be implemented over a one-year period, and

[2] Province of BC Digital Health Strategy (2019). Retrieved from https://bchimps.org/resources/Documents/2019%20Spring%20Conference/HLTH%20ADMs_Barclay_Wright_1Mar2019.pdf

that this evaluation would document the process to serve as a learning tool for the Sunshine Coast division throughout the process, and for DTO to enable scaling of data integration work across the province.

To prepare for data integration, a two key processes took place:

1. In preparation for the data merger, the Practice Support Program supported participating clinics to **engage in panel management** to ensure accuracy. 80% of physicians had completed panel cleanup at the time of writing this report.
2. Clinics worked together to come to **consensus on key fields** where data would be entered consistently in the EMR to support integration.

Panel Management

Panel management (also colloquially referred to as panel cleanup) was essential to the project's success, as duplicate patient records and inconsistent charting create complexity and the potential for data loss during a data migration.

The phases of panel management include ensuring that one's patient panel information is current and accurate, including patient demographic information (a key identifier when linking a patient record across clinics). It also ensures that patients with health conditions such as diabetes are correctly coded in a standardized way for an entire panel, facilitating the seamless merger across multiple clinics with different coding standards.

34 physicians had patient panels and were eligible to receive Practice Support Program (PSP) support for panel cleanup. 82% of the physicians from all 5 clinics chose to engage in panel work.[3] 80% of physicians completed empanelment and cleanup and 2 of 5 clinics completed empanelment and panel cleanup. 35% of physicians also completed panel optimization.[4]

Phases	Physicians complete # (%)	Clinics complete # (%)
Phase 1: Empanelment		
• Review unassigned patients. • Confirm MRP (most responsible physician). • Define patient statuses. • Confirm that active patients are listed on the panel. • Ensure that the staff have a clear understanding of who the active patients are. • Clarify how to maintain an active panel.	27 (80%)	2 (40%)
Phase 2: Panel Clean Up		
• Go through the EMR and find opportunities and go through consider lists.	27 (80%)	2 (40%)

[3] For more information on the phases of panel management, see: https://gpscbc.ca/what-we-do/system-change/panel-management

[4] Note: An additional 6 physicians completed panel cleanup prior to moving/retiring; and an additional 3 physicians completed all 3 phases prior to moving/retiring

• Confirm how coding is taking place within the EMR and ensure that the physician is coding properly. • Search EMR to determine whether a patient should be considered for disease.		
Phase 3: Panel Optimization		
• Identify physician priorities and select 5 SMART goals. • Recalls or reminders, • Work on documentation within the EMR to assist in workflow.	12 (35%)	

Key Clinic Information Fields

During early project planning, the Data Integration Working Group discovered that each clinic had different ways of managing their patient EMR data. In order to work in an integrated system, clinics had to agree on how and where to store specific kinds of data in the EMR. This stage is where the majority of the process-based work for the data integration took place, given the complexity of record procedures and the disparate approaches to storing data in each clinic's EMR.

These fields are included as a reference point for interested clinics to understand an example process for storing data that was agreed to by participating clinics:[5]

Pap test: Filed in "Investigation". 3 clinics wanted them under "Investigation" and 2 under "Labs".
ECG: Filed in "Scanning". Historically results have been found under "Labs" but Life labs falls under "Investigation".
Radiology: Filed in "Investigations". Some physicians update results as they go otherwise some get sent to "Scanning".
Diagnostic imaging: Location unknown. Diagnostic Imaging comes in a text and requires manual download and sometimes x-rays come in the same document. X-rays cannot locate in a new place.
Lab work: Filed in "Labs".
Pathology: Filed in "Labs".
ER Visits: All clinics except Sechelt Medical Clinic Filed in "Visits". Originally 2 clinics wanted under "Consult", 1 under "Labs" and another under "Investigations".
DNR: Filed in "Care plans".
MOST: Filed in "Care plans".
ICBC, WCB, and forms: Filed in "Consultants".
Admission: Filed in "Forms".
Dementia: Location unknown.

Vendor Engagement

Support was provided by the DTO to partner with the EMR vendor, Telus. In Spring 2019, the Data Integration Working Group convened to discuss the data merger and sandbox. Through the help of the DTO Health Technology Partner, physicians' key concerns and needs were

[5] Note that these fields are for Med Access EMR, and other migrations on different EMR platforms will vary.

understood, translated into technical terms, and compiled a shared Google Document, to collectively raise these concerns to Telus.

Identifying and Engaging Partners

The Data Integration Working Group also actively identified key partners in the Data Merger Project. Questions regarding creating a sustainable change including values, communication, and decision making were discussed. An overview of GPSC initiatives relevant to the project was also discussed with the group. The project team reached out to partners for additional information. Calls were conducted with an experienced physician leader from the Fraser Northwest Division of Family Practice and Health Data Collaborative, who had led a project to integrate electronic medical records in OSCAR, another EMR system. They provided general information about the data merger as well as information about governance and confidentiality.[6] The project team held a call with Med Access reference from ConnectCare Medical Clinic in Spruce Grove, Alberta.

Initial Vendor Engagement – Integration Options

Sunshine Coast Division of Family Practice along with Arbutus, Cowrie, Gibsons, Sechelt, and Upstream clinics presented a proposal to Telus outlining the overview of their requirements and their questions. In response, Telus presented two options for Data Integration Project, listed below. More details on these options can be found in *Appendix A - Options for Data Migration/Integration.*

Option 1 - Full database merger
In this option the databases from the 5 participating clinics would be merged into one "master" EMR. This could either be from a pre-existing clinic template (usually the largest clinic), or by creating a brand new instance of the EMR and having each clinic merge their data onto it one at a time. Although this was a less expensive option, it involved significant work to build consensus on shared fields and processes, and what the "master" EMR template would look like. There was concern that certain fields could not be merged, and data would be lost in the process.

Option 2 – New Med Access database "Repository"
This option would involve the least immediate change to current systems for each clinic, with select fields from each clinic's EMR being uploaded nightly to a shared "cloud" repository. The implementation cost and the ongoing cost for maintenance and server bandwidth for this approach is much higher than Option 1, but given the low impact to status quo clinic operations, this was the preferred option by the Sunshine Coast Division of Family practice and all 5 clinics.

All participating clinics and the Division preferred the repository option. Physicians perceived that this approach would eliminate most of the risks of a full merge, and would also allow clinics to continue to operate with minimal downtime. They felt a cloud-style repository would also serve as an additional backup of the five patient databases on a continual basis. However, this option presented myriad challenges. In their response, Telus and DTO recommended against the creation of a repository, given the higher ongoing upkeep costs, technical complexity, risk of overwriting data, and the requirement for ongoing support and maintenance. Instead, Telus

[6] The physician leader provided a link to the article "Electronic system for non-urgent consultations proves valuable": https://www.canhealth.com/2018/08/30/electronic-system-for-non-urgent-consultations-proves-valuable/

recommended choosing between the "two variations" within Option 1 – either using the largest clinic as the master EMR template, or designing a new master EMR template by consensus.

Sandbox Test Environment

Participating clinicians accepted the full database merger recommendation. However, most clinics wanted to get a sense of what the "end product" of the merger might look like prior to engaging in iterative, clinic-by-clinic User Acceptance Testing (UAT). This would be done through an initial "sandbox test environment," effectively a "test database merger" earlier on in the project. The sandbox would contain real patient data and would replicate a full merger for a smaller subset of physicians from one clinic.

In a standard data migration process, this test environment would take place as User Acceptance Testing during phase two. This adaptation to the process accommodated the division's desire to ensure that no data were lost and no other negative impacts occurred, so that participants could be reassured before entering into the process themselves. However, the sandbox would have added extra cost and complexity to the project.

The idea behind this approach was that any major problems could be identified and addressed before all physicians began the actual live merger in phase two (live testing). This would also occur prior to the formal initiation of a contract with the vendor, allowing the physicians to understand what the end product of a merger might closely resemble before committing to the work.

In the later half of 2019, the Data Integration Working Group began selecting criteria for creating a sandbox and merger participation process. In order to participate in the sandbox, the following criteria were developed:

- Adhere to a framework provided to all participating physicians about the project including standard use of forms
- Be willing to show & tell sandbox results, issues and describe the role of panel cleanup
- Add a clinic MOA to the Working Group

Meetings were held with Telus to discuss creating the sandbox, for test merging the data from all clinics at the same time (vs. iteratively), to see what the final output would look like, and what data might be lost or overwritten with that approach. The sandbox would effectively be a test merger of multiple EMRs, using a subset of patient data from a number of family physicians, and would accessed by 15-20 physicians.

Phases 2 & 3 – Testing & Data Migration

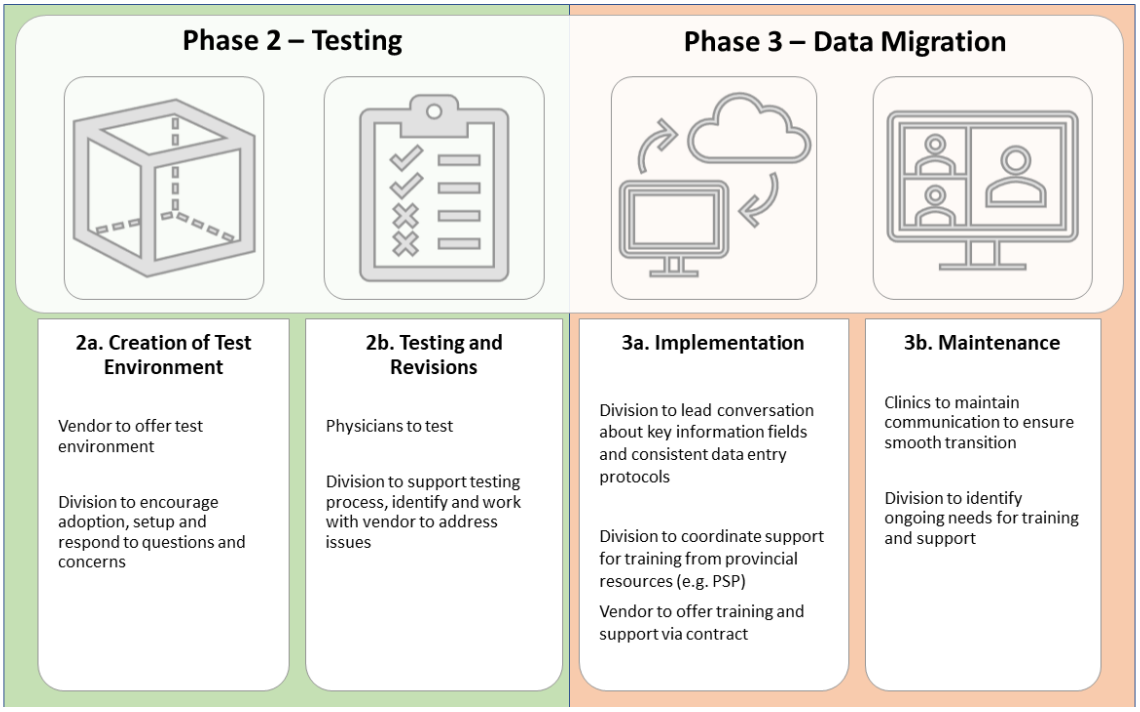
Once the vendor and a group of clinics agree on the details of a data migration project, a contract is typically signed to compensate for vendor time in support of the remaining project phases: the user acceptance testing and revisions, implementing the live merger, and any ongoing maintenance that might be needed to support the work. In the Sunshine Coast, the work was paused prior to the signing of such a contract.

During Fall 2019, the Division and Data Integration Working Group decided to pause the work until Telus completed a generic upgrade to Med Access EMR that were flagged during the Vendor Engagement Phase. This upgrade involved a change to data field hierarchy relationships within the EMR that would reduce potential conflict and data loss in the case of duplicate records, facilitating the overall data migration process. The expected completion of Telus's

upgrade was March 2020. Before the work could be restarted, Divisions shifted to supporting primary care clinics in their adaptation to the COVID-19 pandemic took. At the time of writing this report (Fall 2021), the data integration work is still on hold.

The diagram below details the expected phases and stages of remaining work for the successful data migration, including:

- **The creation of a test environment:**
  - Also known as a "sandbox," where users can attempt a merge without compromising their patient data.
  - This phase is unique to this project – typically a migration would go into testing and revisions without the added step of a sandbox test.
- **Testing and revisions:**
  - Also known as "user acceptance testing," whereby providers import a copy of their live EMR data into the sandbox, examine the result to see what is missing and if there are any major flags. This stage is typically iterative and involves several rounds of testing.
- **Implementation**:
  - Where the vendor and clinics "go live" and proceed with the data migration.
- **Maintenance:**
  - Where the clinics/physicians liaise with the vendor if issue arise, or new fields need to be added or modified to the shared EMR.



Challenges Experienced in Each Phase

Through this case study, several challenges related to each phase were identified. These are included below for other Divisions and community-based physicians to consider as they may undertake each phase:

Initiation

1. A clear problem was identified, but it was challenging to determine the solution that would work best for diverse practice settings and physician preferences and workflows.

Physician Engagement

1. A past data merger projects conducted in 2016 was not completed successfully, resulting in a high degree of skepticism among physicians regarding the likelihood of success, and concern that attempting such a merger may damage records or cause other unanticipated issues. When volunteers were sought for beta testing in November 2019, no physicians offered to participate.
2. The majority of physicians in the community needed to take part for the project to be viable.
3. Peer to peer physician engagement was key to responding to questions, allaying concerns, and negotiating a process that participating physicians felt comfortable with.

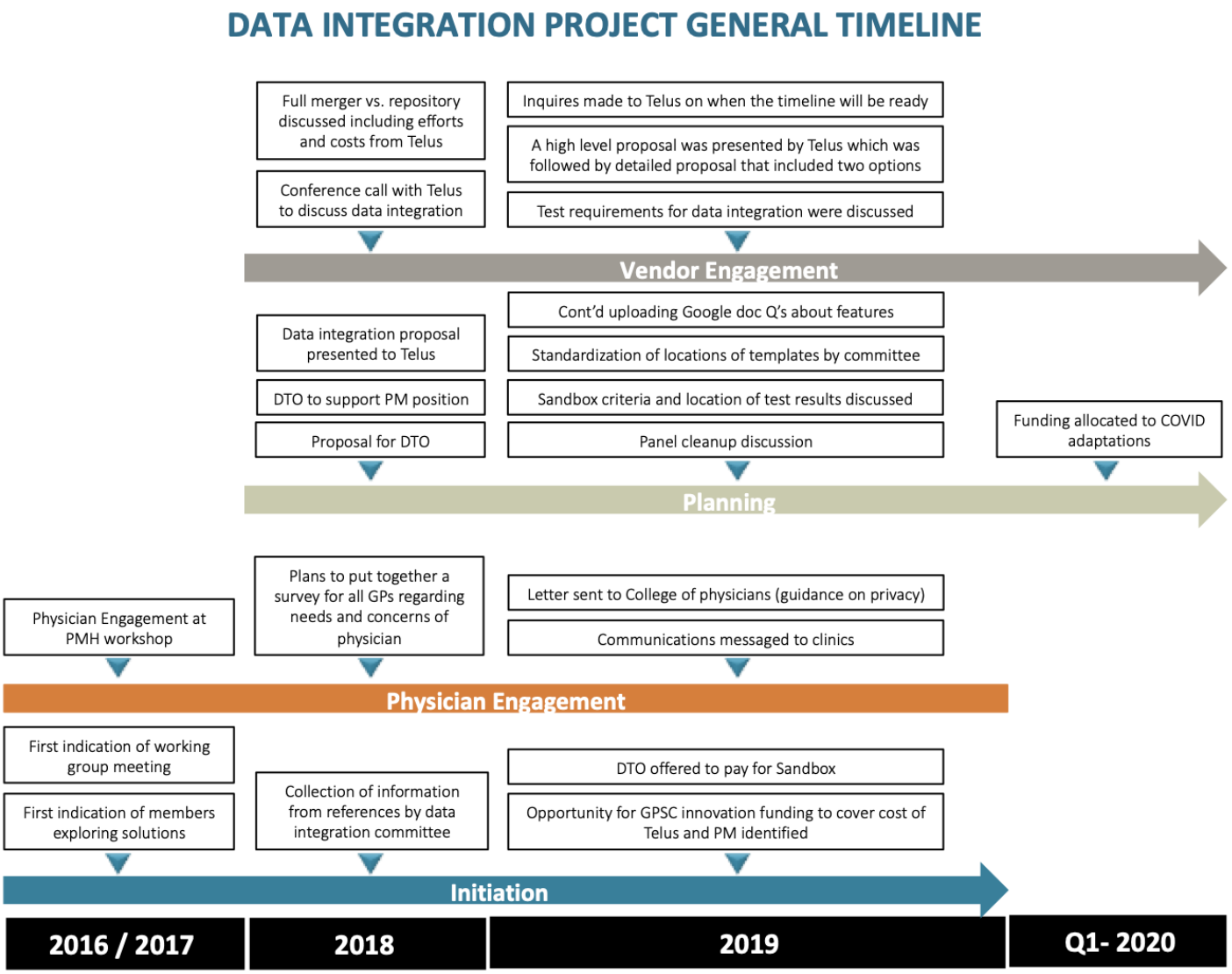
Planning

1. There were different expectation about who should lead the project and the process to follow. The governance model desired by the Division was one of partnership between the Division, DTO and vendor. However, the DTO provided support to the division with the expectation that the division would lead the project, and the vendor engaged with the Division with the expectation of learning from the process, but not in a partnership model. The vendor has a robust process for undertaking projects, and the development of this project was done outside of this process.

Vendor Engagement

1. The vendor did not initially assign staff to engage with the Division in the planning process. The Division engaged the DTO, which was able to successfully engage the vendor to participate in the process.
2. There were several assumptions made regarding the process, and these were not all agreed between the Division, DTO and vendor. The main areas of divergence were:
    a. Creating a sandbox: The Division had envisioned the creation of a test environment “sandbox” using real EMR data, prior to initiating the data integration process for the community. This created added complexity and an extra step to the typical data integration process. Both DTO and Telus recommended pursuing a more standardized process for data integration, but ultimately consensus to create the sandbox was achieved.
    b. The sequencing of the sandbox: The Division preference that Telus create a test environment prior to a contract being signed to undertake the work, contingent on the success of the test environment.

Timeline of Data Integration Project



Governance and Operations

Participating Organizations

Three key organizations were involved in the data integration project- the Sunshine Coast Division of Family Practice, the Doctors Technology Office, and Telus. The groups generally worked well together and expressed a common goodwill to finding a solution, but the roles and responsibilities of each were not always clear. The collaborative structures are described below under Structures.

Sunshine Coast Division of Family Practice

Divisions of family practice are community-based organizations that work with and on behalf of groups of family physicians to achieve common health care goals. Divisions work collaboratively with community and health care partners to enhance local patient care and improve professional satisfaction for physicians. Divisions are funded by the GPSC. The Sunshine Coast Division of Family Practice was established in 2011 and represents physicians who support the communities along the lower Sunshine Coast, including Earl's Cove, Langdale, Madeira Park, Pender Harbour, Sechelt, Robert's Creek, and Gibsons.

The division led the data integration work as a project under the Patient Medical Home initiative and continued the work with GPSC Innovation Funding. The project was led and managed by a working group that included two physician co-chairs and contracted division staff. Division staff support for the project included a data integration project manager, and a PMH project manager.

Doctors Technology Office (DTO)

The Doctors Technology Office (DTO) is a program funded jointly by the Doctors of BC and the BC government through the GPSC. DTO provides technical and advocacy support for BC physicians with a primary focus on those who have implemented an Electronic Medical Record.

During the Sunshine Coast Data Integration Project, DTO provided high-level technical support to the project. DTO maintains an ongoing relationship with Telus across several projects; this connection helped to facilitate engagement between the Division and Telus. DTO also assigned a staff person (a Health Technology Partner) to the project; this staff person had the technical skills to translate the division’s needs into technical language for the vendor. The DTO Health Technology Partner met weekly with the Division Executive Director, Project Manager, and FP leads to discuss the project, occasionally bringing in Telus representatives.

Telus Health

Telus Health (a subsidiary of Telus Communications) is a Canadian provider of digital healthcare solutions. Telus manages an array of health care tools, including Med Access EMR – a web-based EMR platform designed for primary care physicians and specialists. In the context of the Sunshine Coast Data Integration Project, Telus is the primary EMR vendor for all of the participating clinics and family physicians on the Sunshine Coast, and is responsible for managing and developing the required technical changes to enable a data migration/merger on their platform.

Structures (Meetings and Committees)

Following the initiation of the project through the Patient Medical Home Steering Committee, a number of structures were created to support planning and implementation of the Data Integration Project. The project received administrative support through the Division and a project manager.

Data Integration Working Group / Data Integration Committee

The Data Integration Working Group first met in May 2018. An action item proposed during this meeting was to renew discussions with Telus and request an accurate quote and full description of the merger process and timeline. The Working Group discussed general information about data mergers and addressed concerns from participating clinic FPs about data integration. A Project Manager was hired briefly to support the project, but this was not considered a good fit and future support was provided by the division Project Manager. The Working Group led the decision-making process to determine which of the two options presented by Telus the division would adopt.

The co-chairs of this Working Group met weekly with the Division Executive Director and others, including the DTO, throughout the planning and vendor engagement phase to continue moving the project forward. This involved DTO support staff explaining the typical process for a data migration project, listening to the Divisions' concerns, collecting and theming all physician concerns for presenting to the vendor, and working to help address those concerns.

The Data Integration Working Group provided a framework to all physicians about the project and standardized information for sharing forms between all clinics. Clinic physicians and medical office assistant (MOA) representatives on the Committee were responsible for bringing info back and forth between their own clinics and other groups meeting to plan data integration. Members also liaised between clinics and the committee. The group also recognized that adding MOAs from participating clinics to the Working Group further enhanced information sharing with critical support staff.

In July 2019, the Data Integration Working Group convened to discuss the data merger and sandbox. The group identified the need to list features that they want from Telus in a shared Google Document. Questions regarding creating a sustainable change including values, communication, and decision making were discussed. An overview of GPSC initiatives relevant to the project was also discussed with the group.

The Working Group also served as a space to discuss privacy concerns, the two proposed options from the vendor, and how to standardize forms and EMR coding processes (such as where to store lab results) between clinics. This information was then relayed to Telus by the DTO Health Technology Partner in order to design and implement in the Sandbox.

Data Integration Physician and MOA Liaison Meetings

As part of the process of developing a common system, clinics each assigned a physician and MOA to represent them in the data migration planning work. Physicians and MOAs from each of the five participating clinics met as needed to make decisions about how to move the work forward together.

Representatives attending the meeting were initially empowered to make decisions on behalf of their clinics, but decisions about how templates and functions could be standardized across clinics were referred back to each clinic for full consultation with each physician and MOA participant to ensure that the process being determined would be appropriate to the workflow in each practice.

The key clinic information fields were determined through a consensus process with all participants. The final fields were agreed through consideration of:

- workflow implications,
- automated processes where information might be populated automatically within the EMR, and
- manual processes where MOAs may enter data coming from other sources, such as test results.

Privacy Considerations

The Division, with support from the DTO, requested guidance from the College of Physicians and Surgeons of British Columbia in July 2019 to address privacy concerns related to patient records being accessible in the test environment. The Division identified a number of safeguards that would be in place to ensure patient confidentiality in the process:

- Confidentiality forms would be signed by any physician/team member with access to the sandbox.
- Unique user access accounts and passwords would be provided to individuals accessing the sandbox.
- Audit trails would be enabled for all users accessing the sandbox.
- Access to the sandbox would be temporary to support the data integration process. The Division discussed with TELUS to see if it would be possible to remove identifying information so that the sandbox can be used by other communities. It will be deleted if this is not possible.
- Access to the sandbox would be limited to monitored group testing sessions. Users would not have remote access to login whenever they wish.
- A workshop on privacy and data access would be held for all potential users.

In response, the College participated in a conference call with the Co-Chairs of the Data Integration Working Group where they provided approval.

A number of additional questions remained for discussion as the process evolved:

- As patient information will be accessible to more than one family physician (FP), is **patient consent** required?
- Do patients need to sign consent when this **information isn't being used for direct patient care**?
- If consent is required, can patients be notified by posters in the clinics, or **does each patient need to sign** off that their data can be merged into the sandbox database?

In addition to ensuring that the test environment using real patient data met privacy requirements, the DTO also examined how information sharing agreements and permissions would need to be structured. For example, there may be some areas where there should be implied privacy, such as mental health and sexual health. In these cases, the system would need

to be set up to ensure that some records are automatically set as private. Some of the technical questions associated with privacy included:

- Is it possible to limit chart access by Clinic Groups?
- What is the process to override confidentiality restrictions?
- Is there notification to MRP if chart accessed by another user when a chart is marked confidential?
- Is it possible to make patient charts "read-only" to users other than the Primary provider? [Note that by selecting the full data merge, this would not be possible]

Project Resources

Funding

The Data Integration Project received $100,000 of GPSC Innovation Funding, including an additional $40,000 set aside by DTO to pay Telus to develop the sandbox test environment. $60,000 of the funding was almost all spent, covering contracts for a project manager, sessional payments for physician and MOA engagement/participation in design and implementation, and physician leads, as well as a small amount for administration support.

The proposal presented by Telus in November of 2019 indicated that the repository option would cost $53,560 (travel and lodging cost not included) and a reoccurring cost of $850/ month that would be divided among participating physicians. Telus required an additional fee for creating the sandbox. The DTO offered to cover $40,000 for the sandbox to be developed by Telus. The remaining $40,000 from the DTO was not spent, as the work was paused prior to the initiation of the sandbox testing.

In-Kind Resources

In addition to the funding received for the project, resources included:

- Practice Support Program
  - Supporting panel cleanup
  - Supporting MOA network to create the conditions for success through buy-in and contributions to the process

Enablers and Barriers

Enablers

A number of enablers were identified as important to initiating, gaining support for, and planning the project. These are listed below.

Champions

The Division had two strong champions in the Co-Chairs of the Data Integration Working Group. Their personal outreach to fellow physicians as well as their ongoing communication through weekly meetings were identified as vital to sustaining the momentum needed to carry out the phases of the project even in the face of physician concern and timeline delays.

Technical Support

The project relied on high-level technical skills to translate the needs from physicians and MOAs and to ensure that participating practices understood the steps needed to prepare for data

integration. The two Co-Chairs and DTO staff support both provided important technical expertise that advanced the project work.

The Practice Support Program (PSP) provided support through the planning process and facilitated the panel cleanup process to help physicians and practices prepare their EMRs for the implementation phase of data migration.

The vendor, Telus, worked outside their typical process for a data migration to enable the work in the Sunshine Coast. As no contract has been executed for the data migration work, Telus provided time and support at no cost to the Division or participating physicians.

The work was also technically facilitated by all Sunshine Coast physicians using the same EMR, Med Access. This allowed for standardization in process, and also entailed working with one EMR vendor.

Collegial Physician Community

Despite early concerns about the process, physicians in the community were used to working together and generally had existing relationships and the necessary goodwill to work together on this project.

Barriers

Several barriers emerged that impeded the flow of the project. These are detailed below:

Discordant Expectations Among Partners

The division expressed a desire to work in partnership with the DTO and Telus, but the structures in place and the expectations of each organization evolved over time and were not always in alignment. For example, the division expressed a desire for the DTO to play more of a provincial coordination role in system-level data integration work, to lead data integration as a transformation effort and coordinate divisions working on similar projects.

The DTO expressed interest in assisting individual divisions to lead their own projects in order to support innovation at the local level, explore learning opportunities from the experiences of individual divisions, and potentially scale once a viable process and technical solution had been developed and tested.

Telus participated and engaged in the division's desired process for data migration, rather than following their standard process for developing technology solutions for a client. They were open to feedback, questions and adaptations from participating clinics and the Division. Telus and the DTO advised the participating clinics to proceed with sandbox testing while they made necessary upgrades to Med Access (during fall/winter 2019), but the Division and physicians decided to wait before advancing the work. The different perspectives on risk mitigation between these two groups led to the work being put on indefinite pause.

Concern and Lack of Interest from Physicians

While physicians were all generally experiencing the same challenges regarding sharing patient information through their EMR, there was considerable concern expressed about embarking on a data integration process including fear of loss of data or other impacts on workflow and communication. This led to a lack of interest in participating early on, and even at other phases including beta testing, where physicians did not volunteer to participate in early implementation and testing.

Lack of Clear Timeline

The project was originally estimated to take 18 months. However, this estimate did not include sufficient detail regarding the project phases, and needed to be adjusted when faced with several other barriers: low initial interest and uptake from physicians in the community, the time and technical knowledge required to assess the technical options and determine an appropriate solution, the time needed for preparation including determining the key information fields and where information would be stored within the EMR, and the time needed to repair any technical issues that arose during the process.

Workflow Variations

Barriers for standardization arose from differences in workflows between individuals and clinics. This was overcome through the process, but this took additional discussion, negotiation and time on the part of all participating physicians and MOAs.

Ongoing Communication

Finding time for meetings among physicians with busy practices and commitments at the hospital and other community facilities was a challenge. In addition, the Co-Chairs and the Working Group required ongoing communication to keep up to date, maintain momentum and ensure follow up on actions. For busy physicians, keeping a regular meeting schedule was challenging but valuable.

Technical Challenges

Several technical challenges arose during the planning and vendor engagement phases. The main one, which required the project to be paused while it was resolved, was the issue of identifying the hierarchy of duplicate files. For example, medical information may be more up to date in one record, but patient contact information may be most up to date in another. The system required a means of identifying the files which should be used as active in the merge.

Recommendations

Throughout the phases of the project, suggestions were made to improve the process as participants learned from the experience. These were captured in meeting minutes, project documents, and through interviews with key informants. The key recommendations are listed below.

Clearly Outline Project Phases and Expectations

A desire was expressed to set out a clear timeline for the project, but the timelines shifted so significantly in this project that it is recommended that rather than setting a detailed timeline, the phases of the project and the expectations within each be set out clearly, so that it is well-understood what is required before a next phase can begin. The phased approach reaffirms that iteration and testing is critical to data integration work with large, complex EMR data, and perfection is unlikely at the outset. As a result of this project, these phases are now clearly laid out in the DTO Guide: How to Prepare for an EMR Data Migration.

Agree on Shared Project Agenda Between Partners

The partners in this project worked well together and showed goodwill to one another, but at times perspectives on the best way forward diverged based on different needs, priorities, styles of work, and expectations. To navigate this tension, It is recommended that the partners develop a shared agenda by considering and openly discussing in a scoping conversation:

- **Goals**: what do you need and desire from the data integration process?
- **Assumptions and fears**: what are some of your assumptions, concerns, or hesitations regarding data integration? What is the worst-case scenario outcome?
- **Resources & capacity**: what resources does each party have to contribute to the project? What internal constraints to capacity exist?
- **Roles and responsibilities**: what roles and responsibilities are you able to commit to, contribute to, and support over time?

This conversation may be revisited throughout the data integration phases as the understanding of the project evolves over time.

Prepare to Provide Technical Support

It was essential that DTO program staff provided the service of collecting, collating, and translating physician and Division concerns into technical language for the vendor. It is recommended that partners engage technical experts to understand and represent their interests.

It is also recommended that partners openly discuss and agree on training, troubleshooting and other maintenance issues that will need to be addressed throughout the data integration project. This could involve maintaining a log of issues and suggestions as they arise (as the vendor did in this project), for consideration once the project reaches the implementation phase.

Provide Provincial Coordination

Though the perspectives of the various partners were different, the Division expressed the strong desire for provincial coordination to support the following:

1. **GPSC/Ministry leadership** in working with the vendor to ensure sufficient influence over the process, to maintain urgency and ensure a scalable outcome.
2. **Coordination support to Divisions working on data integration** to ensure:
    a. Information sharing regarding the scope and cost of the work including identifying potential synergies;
    b. Sharing lessons learned and co-designing coordinated planning for technical processes undertaken by physicians and divisions (such as identifying key information fields in EMRs and determining approaches to form management and templates for locating key items within an EMR); and,
    c. Sharing of developments in common protocols for data entry and management, training resources, innovations and learning.
3. **Continued support for EMR Panel Cleanup and supporting optimized EMR use as an essential requisite** for proactive patient care, team-based care, and Division-wide collaboration and planning.

Identify and Support Data Privacy Needs

Ongoing support should be provided to ensure that the project meets privacy requirements. Physicians operate in a regulatory environment governed by the Personal Information Protection Act (PIPA), but are increasingly asked to share data with other health care providers operating in a public environment governed by the Freedom of Information and Protection of Privacy Act (FOIPPA) as primary care shifts to more complex, collaborative models through Primary Care Networks and other integrated approaches to primary and community care.

Conclusion

Between 2018 and 2019, the Sunshine Coast Division of Family Practice worked with Telus to initiate the merger of five Med Access EMR databases from five independent clinics on the Sunshine Coast into one clinical database for all patients through a data integration project. The project uncovered the typical phases of a data migration project and was instrumental in identifying necessary upgrades to the Med Access EMR platform.

The project was put on hiatus during Fall 2019, and was not revisited after the COVID-19 pandemic. This case study offers useful lessons for other divisions considering data integration work – particularly the importance of acquiring clinic consensus and buy-in with project direction, having physician champions who can lead the work, and having technical experts to facilitate communication of physician and Division needs with the EMR vendor.

Appendix A- Options for Data Migration/Integration

In the spring of 2019, two options were presented to the Data Integration Working Group by Telus. The pros and cons of each option identified by Telus are described below:

Option 1: Full Merge

A full data merge was expected to create a single medical file for each patient, accessible by participating physicians and team members in the community, across different practice settings.

Pros	Cons
Telus noted the following pros: • Truly shared charts • No eReferral needed between sites • Paying for one site instead of 6 • Shared Templates, Providers & Facilities, Macros (potentially), workflows (i.e. the quick button to assign to a staff member) • Easier collaboration The Working Group noted that it was the least expensive option with a one-time cost and that Telus had experience with this approach as it had been done before.	Telus noted the following cons: • Some information would not transfer with data migration • Some information would transfer in a different format (i.e. Bills will be labelled as imported, not fully paid) • Initial discovery period, finding favorite templates, creating new visit templates • Higher stress levels earlier on The Working Group felt that this option would be harder to market to FP group.

A full merge was initially resisted by participating physicians due to concerns about expenses, standardized rules regarding how physicians use their EMR, and because of concerns that if anything were to go wrong, the consequences to the primary care system for Sunshine Coast would be significant.

During the decision-making phase, a number of questions and concerns arose about a full merge, including:

- Target database demographic data would replace donor database demographic data with no opportunity for manual reconciliation
- Mandatory that all recall lists/pending tasks are transferred over post-migration
- Concern over potential loss of data - how to guarantee against this and what is the process to rectify this if it happens
- Some technical concerns about the Allergies and Intolerances field with records showing “none known”
- How to reconcile the same lab results sent to two separate clinics before the migration
- How to migrate personalized templates and workflows

Option 2: Repository

A repository was expected to provide access to a patient’s medical file located on another participating physician’s EMR in the case that a physician seeing a patient required access to additional medical information stored on another record.

Pros	Cons
Telus noted the following pros: • No change in usual day to day workflow • Less stress early on • Can be used for a shared database of templates as well (via export and import) The Working Group noted that this option may be easier to market to FP group.	Telus noted the following disadvantages: • High risk of breakdown at individual level (requires manual "push" of all data) • More expensive • Ongoing annual fees (unsure who would pay) • Requires governance committee • Never been done before by Telus The Working Group noted that the system would be similar to the current approach but there would be higher cost associated with creation and maintenance. There would be time added to each interaction (eReferral post visit etc.) and login would be required for new instances to retrieve information.

The five clinics initially wished to integrate their patient data without resorting to a full merge into a single live system. Their desire was for each clinic's patient data to be uploaded into a single shared repository at regular intervals, and for participating users to be able to retrieve patient data from this repository on a read-only basis.

This approach was felt to eliminate most of the risks of a full merge, allow clinics to continue to operate with minimal downtime, and provide the side benefit of an additional backup of the five patient databases on a continual basis. Each clinic had its own preferred Med Access configuration settings (e.g., workflow, templates, filters, billing) specific to and well known by their users, and the clinics wished to continue to maintain private EMRs within each clinic.