



## CENTRAL VERMONT MEDICAL CENTER

PROVIDES VISIBILITY INTO PHYSICIAN

UTILIZATION WITH THE DIVER SOLUTION

FOR HEALTHCARE



*Central Vermont Medical Center is the primary healthcare provider for a three county area and spans an eclectic mix of seventeen physician practice groups. CVMC's hospital, located in Berlin, Vermont, employs nearly 1,400 people in its 122 bed facility. The facility's Emergency Department treats more than 25,000 patients annually and CVMC staffers perform 164,000 outpatient treatments including over 3,000 outpatient surgeries each year. The Medical Center staff includes 135 physicians and 35 nurse practitioners, physician assistants and midwife.*

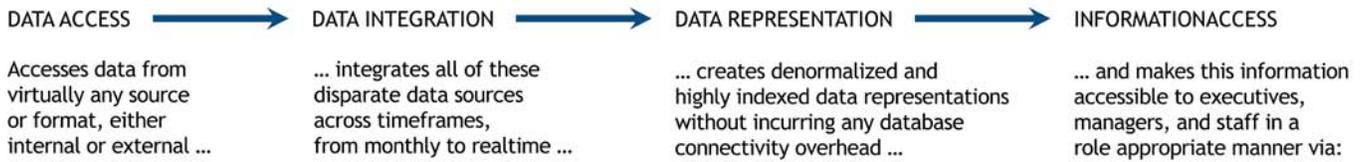
CVMC uses the MEDITECH™ Healthcare Information System (HIS) employed by over 50% of U.S. hospitals. The various MEDITECH applications share a common database and provide a broad spectrum of clinical, financial, and operational functionality to healthcare providers. MEDITECH applications are transactional in nature, capturing data on healthcare processes as they happen. In order to transform this valuable raw data into actionable

information, a versatile third-party business intelligence (BI) tool is required. In August of 2006, CVMC implemented Dimensional Insight's The Diver Solution for Healthcare™ in order to satisfy this requirement. Diver provides an end-to-end, fully integrated BI platform that includes self-service reporting, analytics, dashboards, and extensive data visualization capabilities.

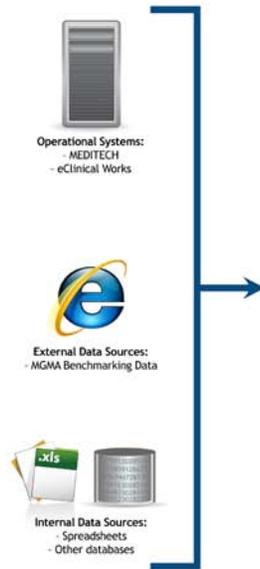


DATA → INFORMATION → ACTION

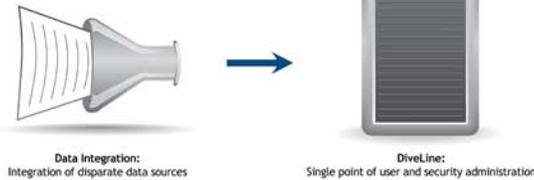
# Dimensional Insight HIDS™ (Healthcare Information Delivery System) For Central Vermont Medical Center



## Source Systems



## Dimensional Insight HIDS™ The Diver Solution™



## Capabilities



“I’M VERY HAPPY WITH THE DIVER SOLUTION. I THINK IT’S ONE OF THE BEST BUYS I’VE EVER MADE FROM A SYSTEM STANDPOINT.”

MICHELLE HEEZEN,  
INTERIM V.P. OF PHYSICIAN SERVICES,  
CVMC

**SELECTING THE RIGHT BUSINESS INTELLIGENCE PLATFORM** Michelle Heezen, CVMC’s Interim V.P. of Physician Services, recalls the rigorous year-long vetting process that CVMC’s cross-functional team undertook to find an analytics and reporting platform that would meet CVMC’s needs. The team was comprised of Finance, Nursing, Outpatient Services, and IS staff. Team members began not by evaluating software vendors, but by understanding CVMC’s internal reporting needs.

They attempted to answer questions such as:

- What is the best source system for a particular piece of information?
- What information do managers need to make decisions?
- Who is reporting what data, and how do we make these data sources consistent?
- How do we educate end-users about the information that is available to them?

“I ACTUALLY ENJOYED THE SALES PROCESS. I COULD TELL WHEN WORKING WITH DIMENSIONAL INSIGHT’S SALES REP THAT HE WASN’T JUST A SALESMAN. HE ACTUALLY KNEW THE PRODUCT. AND THEN ONCE WE STARTED TO GET TO KNOW THE REST OF THE DIMENSIONAL INSIGHT TEAM, THE SUPPORT, THE CONSULTANTS, THE TRAINERS, I WAS REALLY QUITE IMPRESSED.”

MICHELLE HEEZEN,  
INTERIM V.P. OF PHYSICIAN SERVICES  
CVMC

Heezen recalls, “Once we had gotten to that point I created a very rudimentary MS Word document that had links to all of the different reports, which we called our reporting portal. That saved people from logging in and out of three or four systems, but the reports were static. I made most of them PDF files or copy-protected Excel files. People were thankful to have the data in one spot but the lack of interactivity meant they couldn’t switch months or drill down on a particular provider. That’s when we felt we were ready for a real reporting and analytics tool.”

The team evaluated over a dozen BI and Decision Support tools, while not constraining themselves exclusively to vendors in Healthcare BI. “We looked at a variety of vendors and a variety of price ranges, including some big vendors like Hyperion. It came down to Dimensional Insight and a competitor. The competing product was much bigger. It had a lot of bells and whistles as we characterized it, but it wasn’t as end user friendly”, according to Heezen.

Some of the criteria that Heezen’s team used to evaluate the candidate BI platforms were ease of future scalability, determining whether functionality was adequate without being overwhelming, and that the selected application would actually be accepted by end users. Heezen elaborates on the latter criteria. “We had gone through several different systems in accounting and finance area that we bought and never used at all, or bought and only used a piece of.

We also had two separate benchmarking tools running. I kind of felt we were system happy. I wanted to make sure that we bought something that we actually utilized, and got all of our money back on.”

As for the final vendor selection, Heezen notes, “There was one thing that put Dimensional Insight over the top and that was the proof-of-concept demo. The fact that DI actually took an extract of our data and showed us what it looked like in Diver a few days later was really the selling point for us. In addition, Dimensional Insight’s familiarity with MEDITECH and Non- Procedural Representation (NPR) reports was also important to us. DI was able to get us going immediately. Some of the vendors we evaluated were huge, and we knew we weren’t going to get that personal attention.”

**BUSINESS INTELLIGENCE WITHOUT CONSULTING EXPENSES** Kevin Knapp, CVMC’s Data Warehouse Analyst, recalls the relative ease with which he was able to implement his initial applications based on The Diver Solution’s BI platform. A Dimensional Insight consultant provided Knapp with basic hospital utilization models that served as a blueprint for accessing MEDITECH data. Using that report as a template, Knapp was soon pulling charges, bed census, and general ledger data from MEDITECH. This early application was the beginning of CVMC’s foray into healthcare information dashboards.

Starting with the original integration scripts for accessing MEDITECH data via Diver, CVMC began extracting and

“WE PICKED DIVER UP REAL FAST.  
WITHIN 2 MONTHS WE WERE BUILDING  
OUR OWN MODELS.”

KEVIN KNAPP,  
DATA WAREHOUSE ANALYST,  
CVMC

consolidating data from MEDITECH's Billing Accounts Receivable (BAR), Abstracting, and Admissions modules for performing reporting and analytics. From there, they added cost accounting and general ledger information. Diver allows CVMC users to view high level P&L's and then to “dive” down all the way to individual invoice numbers if that level of detail is required. Currently, Knapp is using Diver to pull data from six MEDITECH modules, including Abstracting, Admissions, General Ledger, and Payroll. Additional data sources accessed by Diver include MS Excel spreadsheets, eClinicalWorks, budgets, benchmarking data, and links to web pages. Asked to elaborate on CVMC's implementation costs for The Diver Solution, Heezen proudly notes that, “We ordered 10 consulting days when we first bought the product in August of 2006. Four years later we had one of DI's consultants here for a few days and one of those days was still covered in my original 10 consulting days.”

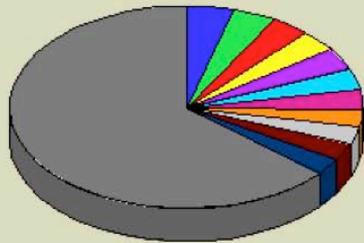
From the outset of the BI vendor selection process, Heezen felt very strongly that the selected tool should not make users dependent on the selected BI vendor for support or consulting. She adds, “I hoped that the product wasn't so cumbersome that we couldn't tweak it or change it or do what we wanted to do. People are rightfully concerned about ongoing maintenance costs and whether they need to have a consultant onsite all of the time to keep things going. For me it was really important that we were able to not just maintain it but build what we wanted.”

**PROVIDING VISIBILITY INTO PHYSICIAN PRACTICE UTILIZATION** At the time Diver was being implemented in August 2006, CVMC was using the LSS Physician EHR and practice management software, co-located on their MEDITECH server. With minimal training or consulting support, Knapp was able to bring his first Diver applications online by October, extracting data from MEDITECH and LSS. In 2007, CVMC switched from LSS to eClinicalWorks for physician practice management. Knapp was able to retool his Diver dashboard application to start pulling data from the MySQL database underpinning eClinicalWorks with relatively little effort. Asked to comment on his learning curve with Diver and its data integration capabilities, Knapp replies, “Very intuitive. I printed out the data integration scripts that Dimensional Insight's consultant had written and figured out what they were doing. So it was a very quick learning curve for me. I really like Diver's Visual Integrator component. I use it for things even when I'm not creating DI Data Models just because it's a very fast tool for chopping up data.”

Knapp updates the data for each of the 17 physician practices in the CVMC network once a month. The office managers then generate reports for each physician in their practice. The reports display each physician's Relative Value Units (RVU's), which are of interest to physicians for determining bonuses and compensation, as well as budgetary figures and trending information. Another function of the Diver reports is delivering follow-up

Group Name All Values (22) Type of Visit All Values (3) Charge Category All Values (15)  
 Fiscal Service Year-Month All Values (46) Fiscal Service Year All Values (5) Physician Name All Values (81)

Visits by Physician Name  
 (Shown as Percent Total)



(4.4 %)	Martin, Paul
(3.9 %)	Gray, Richard
(3.5 %)	D'Angelo, Linda
(3.5 %)	Regazzina, Frank
(3.5 %)	Stephens, Thomas
(3.3 %)	Morgan, Donna L.
(3.2 %)	Lee, Joanne
(2.8 %)	Samuels, Rachel
(2.8 %)	Boucher, Mark
(2.8 %)	Burns, Colin
(2.7 %)	Sapiro, Robert
(63.6 %)	Other

Period Actual Visits by  
 Physician Name

Physician Name	Visits
Martin, Paul	15,955
Gray, Richard	14,175
D'Angelo, Linda	12,894
Regazzina, Frank	12,838
Stephens, Thomas	12,783
Morgan, Donna L.	12,107
Lee, Joanne	11,663
Samuels, Rachel	10,385
Boucher, Mark	10,285
Burns, Colin	10,070
Sapiro, Robert	9,787
Gregorio, Jonah	9,625
Farmer, Russell	9,428
German, Louise	9,220
Cross, Nicholas R.	9,112
Ahmet, Zvi	8,922
Desyatnik, Elena	8,779
Soto, Roger	8,418
Chandler, Bradford	8,046
Faircloth, Jack	7,855
Richmond, Sabina	7,688
Champi, Fanny	7,532
Carrey, William	7,337
Whitehead, Justin	7,237
Jackman, Edward T.	7,082
Depaul, Alec	6,846
Connarton, Julie	6,566

alerts for chronic care patients with specific conditions, such as asthma, diabetes, hypertension, and elevated lipid levels.

Diver tracks which patients manifest these conditions, their primary care provider, and their last appointment date. A report is then automatically generated and sent to the providers to alert them of the need for a follow up appointment. Knapp illustrates one of the reports. "For diabetes we're giving them the patient's latest A1C level and if it's too high there's a message displayed along with their cholesterol and their triglyceride levels." According to Knapp, the physician practice utilization application has been very well received by the CVMC user community.

These alerts serve to significantly improve the quality of care delivered by CVMC's physician practices while also helping to contain costs. Rather than relying on staff to manually schedule follow-up visits, the

Diver application automates the process, eliminating the potential for errors or human scheduling failures. The proactive nature of the alerts potentially decreases expensive visits to the Emergency Department as well by helping physicians and patients stay abreast of their disease management regimens.

A broad range of financial and utilization metrics are displayed on the Diver practice management dashboards. Each physician practice can view number of visits for the fiscal year-to-date compared to the identical period last year, broken down by individual physician.

Visits can be grouped by payer, and accumulated RVU's by physician can also be displayed. Each practice can view a sorted list of the top procedures their physicians have performed. All data can be presented in either a year- or month-to-date format for transparent comparisons.



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CVMC provides benchmarking feedback to the physician practices using data from MGMA, a vendor of revenue/expense, compensation and production, and group performance data. Diver is used to generate a report showing the MGMA data against the actual data for an individual provider. Practices and physicians can view their current RVU’s in the comparison to MGMA’s median, 25th percentile, and 75th percentile values.

The business value provided by benchmarking is compelling. Benchmarking helps informed healthcare consumers make better decisions about which physician practices to patronize. On the physician side, benchmarking identifies excellent physicians and provides an early warning signal for managers needing to deal with sub-par physicians.

**DEPLOYING DIVER** Due to the extensive vendor evaluation process that CVMC’s team had undertaken, end users had extensively communicated their report requirements, as well as the shortcomings of their old reports. With Heezen’s MS Word-based portal, end users obtained a view of what was possible, but without being able to interact with the reports. CVMC’s team then built a comprehensive collection of reports in Diver that met user’s expectations and requirements. CVMC’s team create applications for DivePort, DI’s web portal environment, and use the ProDiver tool to build Markers and reports for end users that are then used to populate the portal. The remainder of CVMC’s user base consists of more casual users – or information consumers

– that have access to DivePort’s “One-click Command Center”, versatile and customizable functionality that provides users with advanced drill-down capabilities, file exporting functions, and the ability to access DI’s web-based ad hoc analysis client, NetDiver, directly from a DivePort dashboard.

Asked to detail CVMC’s Diver deployment roadmap, Heezen recalls, “We had Diver for many months before we put it out to the end users because I wanted to make we were ready to support those users and answer their questions. From a cultural perspective, it was important for the end-user community to see that we were very comfortable with the product.” In addition, Heezen and the team wanted to replace the Microsoft® Word based reporting portal completely in order to prevent users from becoming frustrated with the process of having to go to multiple areas for the information they needed.

While CVMC’s team has focused largely on using Diver to create director-level reports and dashboards, next steps include the migration to version 6.2 of The Diver Solution and executive dashboards. With the data feeds in place to support high level summaries, Heezen feels that early Diver champions such as CVMC’s CEO, already a daily user of Diver, and their VP of Nursing would realize the benefits of a single-page view of consolidated data. Heezen observes that, “The nice thing is we’ve now got the data, we’ve got everything built up to create some high level dashboards.”