

A stylized, semi-transparent graphic of a person holding a mobile device, overlaid on a dark brown background with geometric lines and shapes. The person is shown from the waist up, holding a device in their right hand. The background features a large dark brown cross shape and various lines and curves in shades of brown and black.

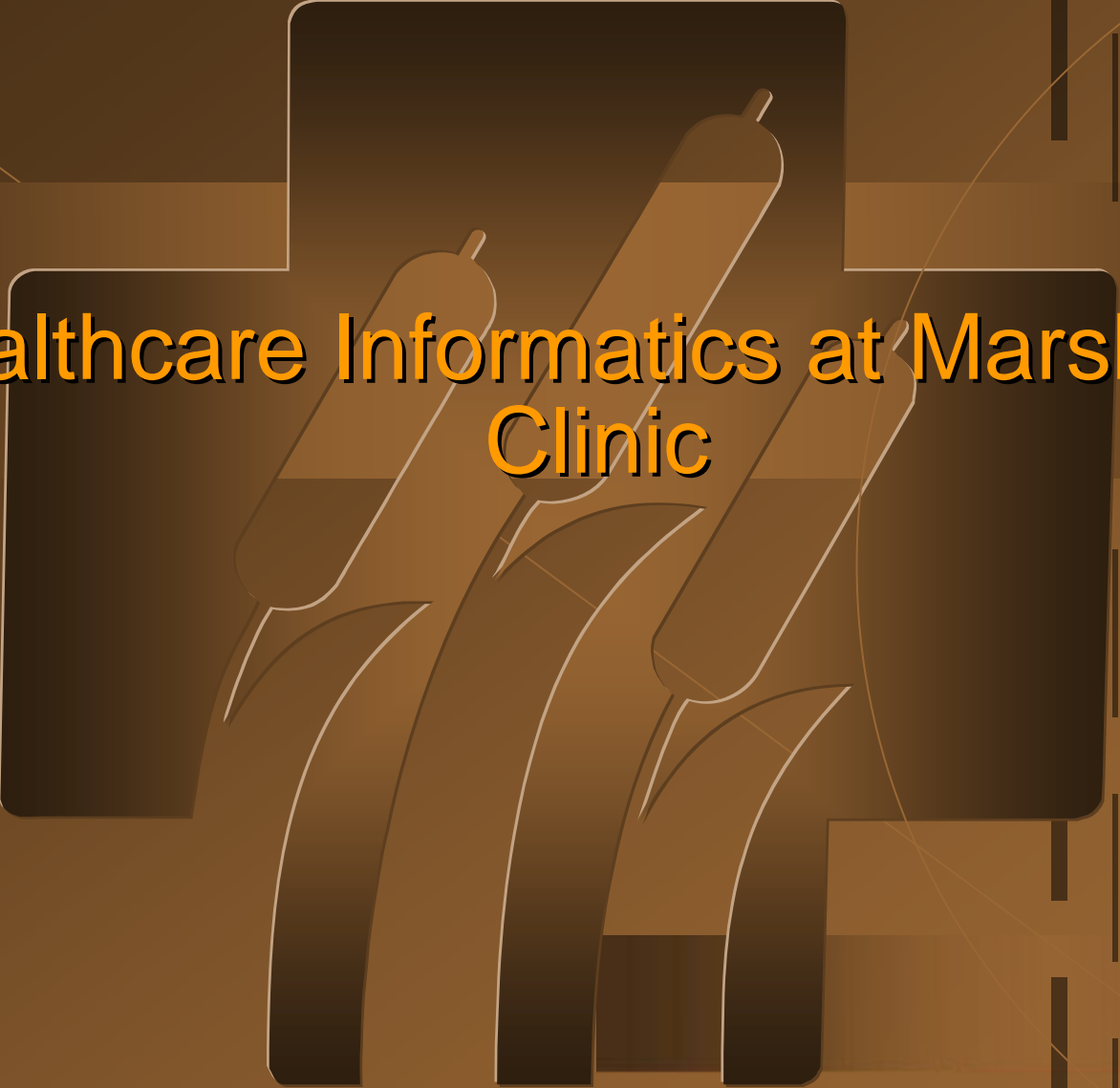
Leveraging Information Technology to Transform Healthcare for Chronic Disease

FTC, Innovations in Health Care Delivery Workshop

April 24, 2008

Thomas Berg

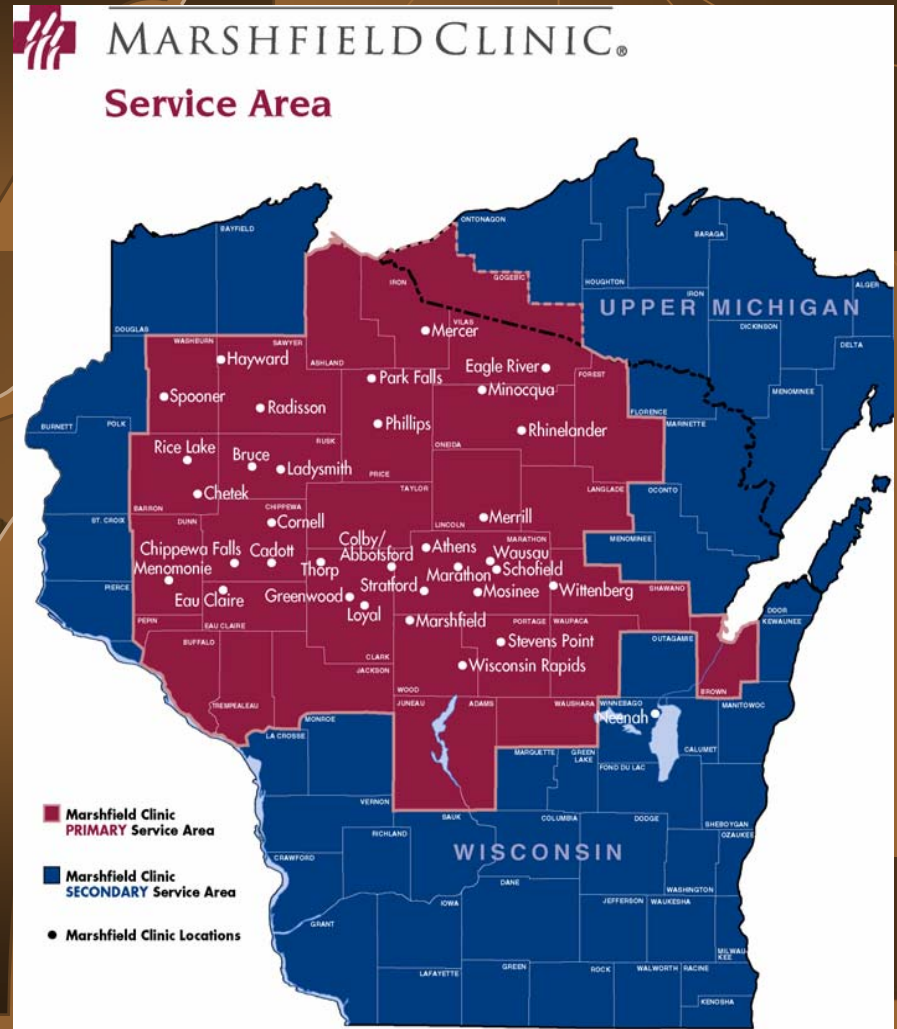
Marshfield Clinic



Healthcare Informatics at Marshfield Clinic

Marshfield Clinic

- Founded 1916
- 780 physician providers
- 45 Regional Centers
- 5 Dental Clinics
- 360,000 unique patients in 2007
- 3.5 million patient encounters in 2007
- EHR on over 2 million patients
- Marshfield Clinic Research Foundation
- Education programs – Internal Medicine, Surgery, Pediatrics, Med/peds, Transitional, Dermatology



IT @ Marshfield

- Started in 1964
- In-house development
 - Over 190 developers
 - 380 total staff
- EMR 1985
- 100% physician adoption since 1994
- Integration culture
- Strong leadership support



EHR Status

- We have internally developed our EHR software
- The Software suite is CCHIT certified
- Marshfield Clinic is chartless



25-02
22-03

BEFORE

AFTER



HIE by Technology Adoption

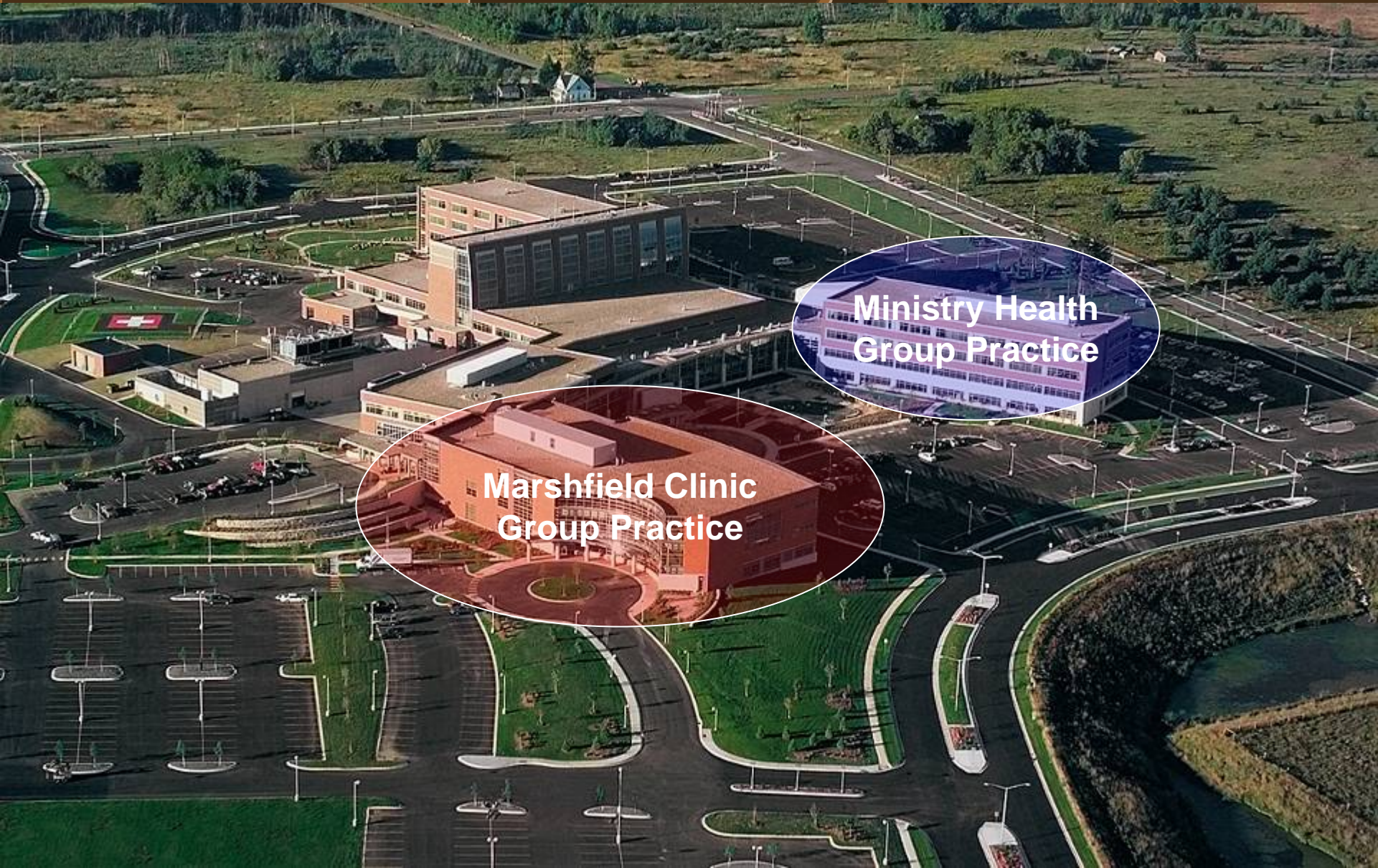
- The Marshfield Health Information Exchange (HIE) is a multi-organization, integrated healthcare information system
- ...

Multi-organization Chartless Campus - Weston Wisconsin



**Marshfield Clinic
Group Practice**

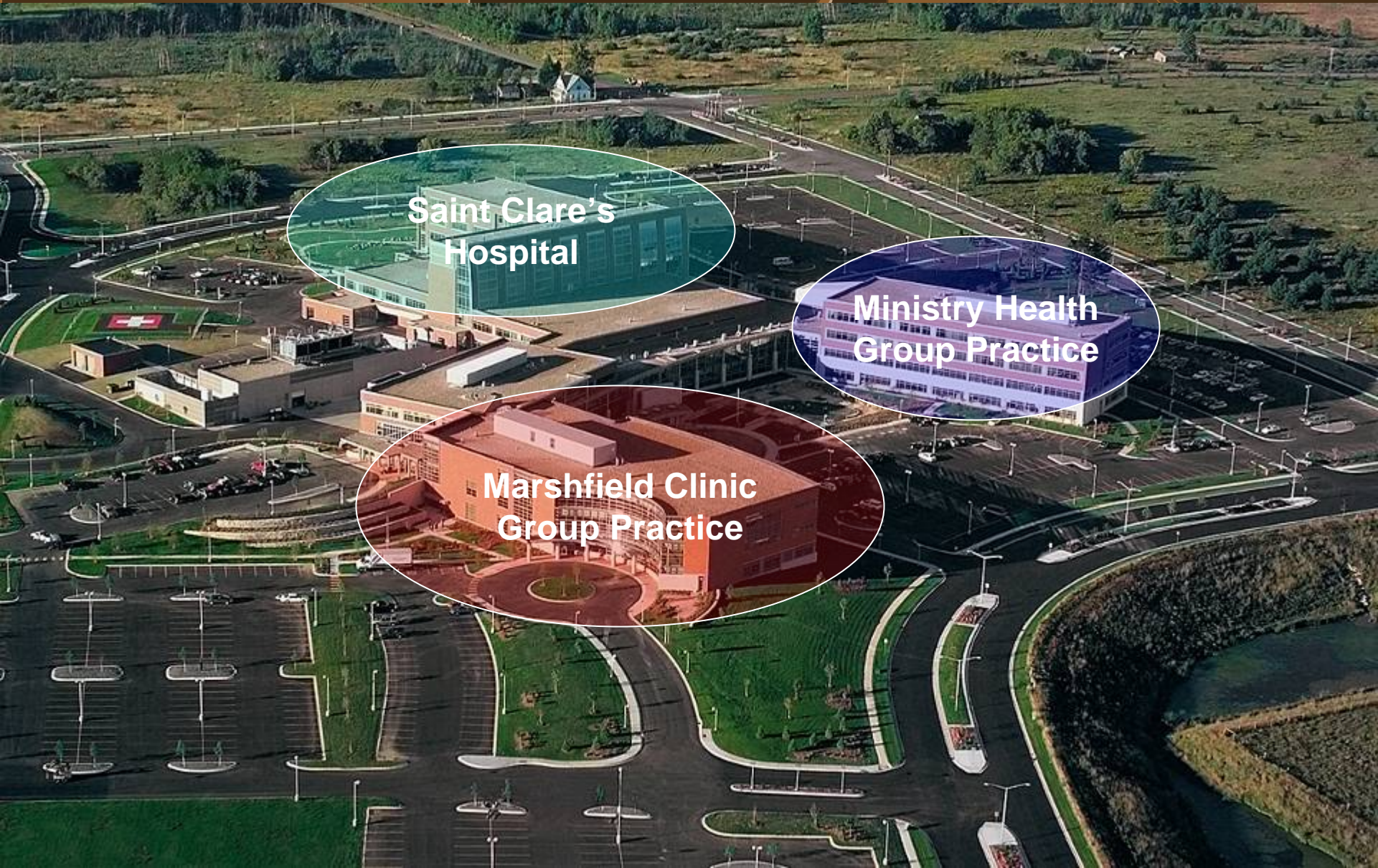
Multi-organization Chartless Campus - Weston Wisconsin



Ministry Health
Group Practice

Marshfield Clinic
Group Practice

Multi-organization Chartless Campus - Weston Wisconsin

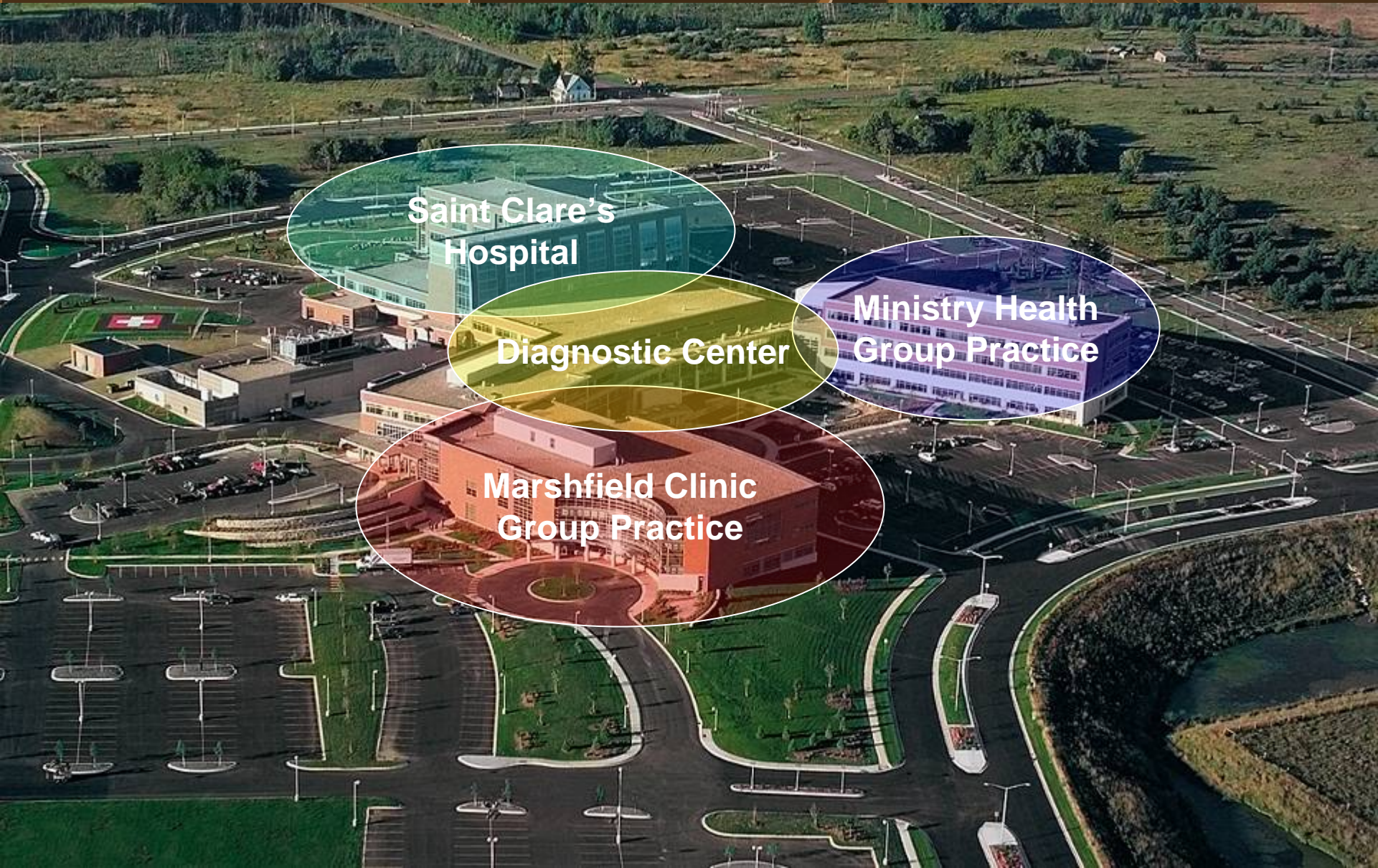


Saint Clare's
Hospital

Ministry Health
Group Practice

Marshfield Clinic
Group Practice

Multi-organization Chartless Campus - Weston Wisconsin



Saint Clare's
Hospital

Diagnostic Center

Ministry Health
Group Practice

Marshfield Clinic
Group Practice

Multi-organization Chartless Campus - Weston Wisconsin



Saint Clare's
Hospital

Multiple Organizations

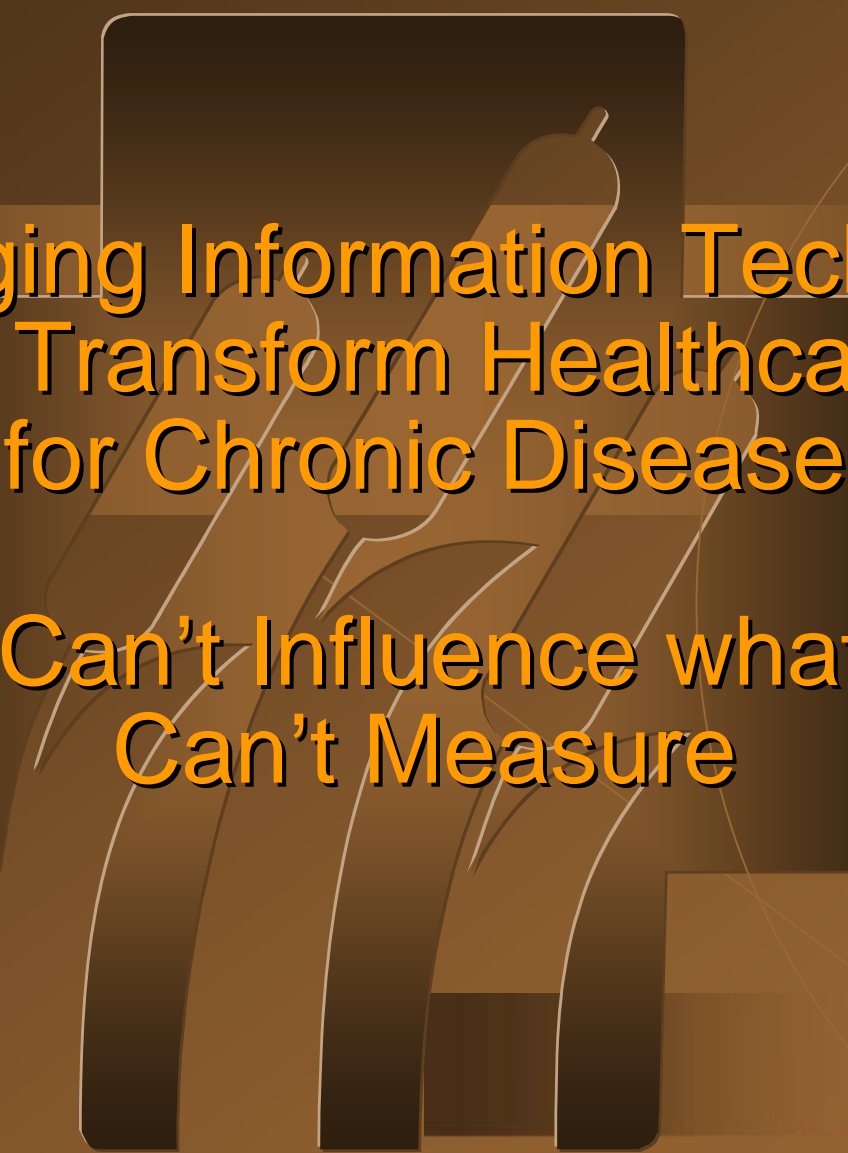
No paper charts

Single Electronic Record

Seamless Care

Diagnostic Center
Group Practice
Main Building
Group Practice

Ministry Health
Group Practice

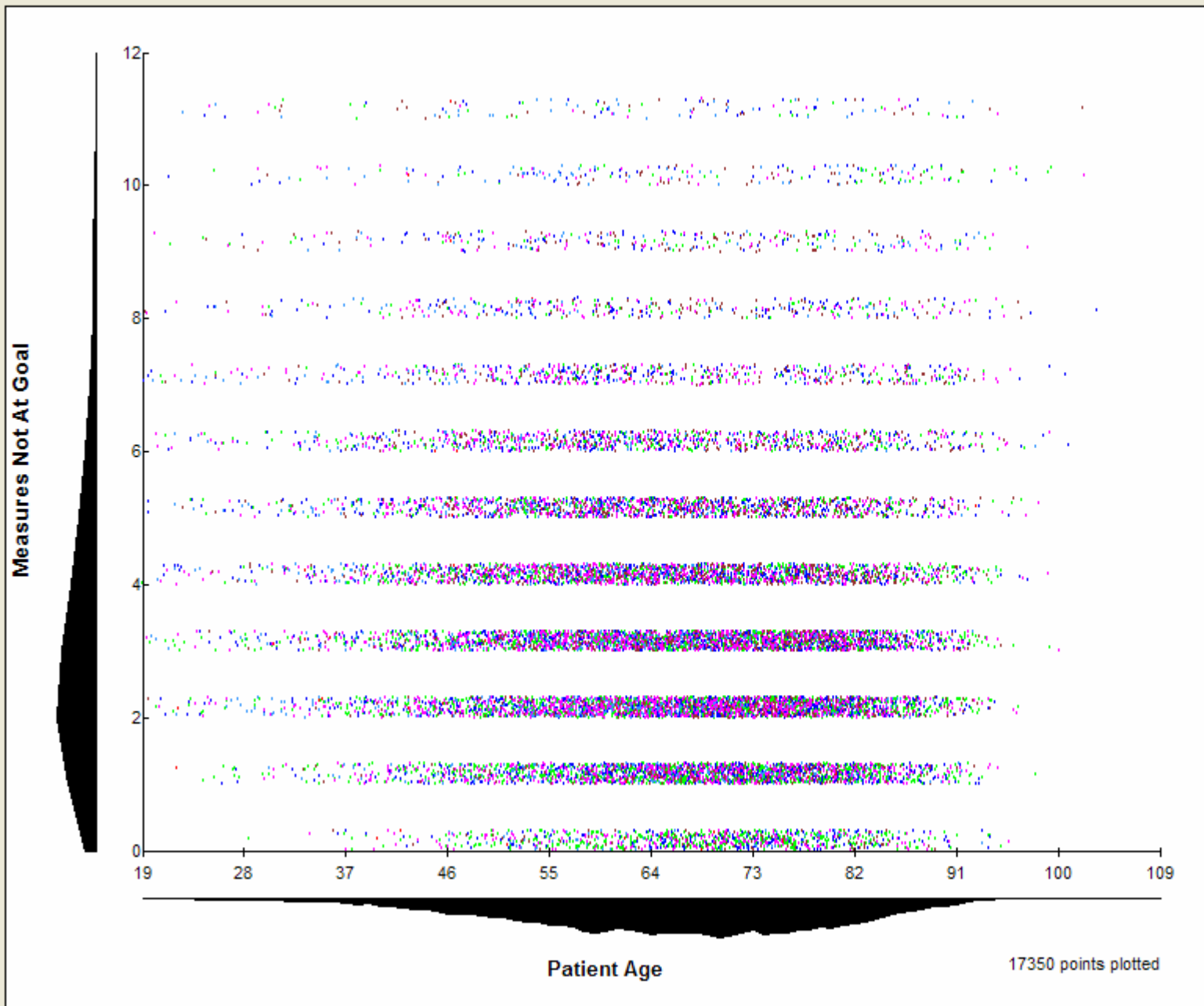
A stylized, semi-transparent graphic of a person holding a smartphone is centered in the background. The person is depicted in a simple, white outline style against a dark brown background. The smartphone is held in their right hand, and the screen is lit up. The overall aesthetic is modern and tech-oriented.

Leveraging Information Technology to Transform Healthcare for Chronic Disease

You Can't Influence what you
Can't Measure

A stylized graphic featuring three mobile phones in the center, each with a signal wave emanating from its base. The phones and waves are rendered in a light brown color against a dark brown background. The phones are arranged in a slightly overlapping, diagonal pattern. The signal waves are represented by curved lines that sweep downwards and outwards from the bottom of each phone. The background consists of various shades of brown, with some geometric shapes and lines, including a large, faint, curved line on the right side.

The Data My System (Data from 5000 feet)



Division: (All) [v]

Department: (All) [v]

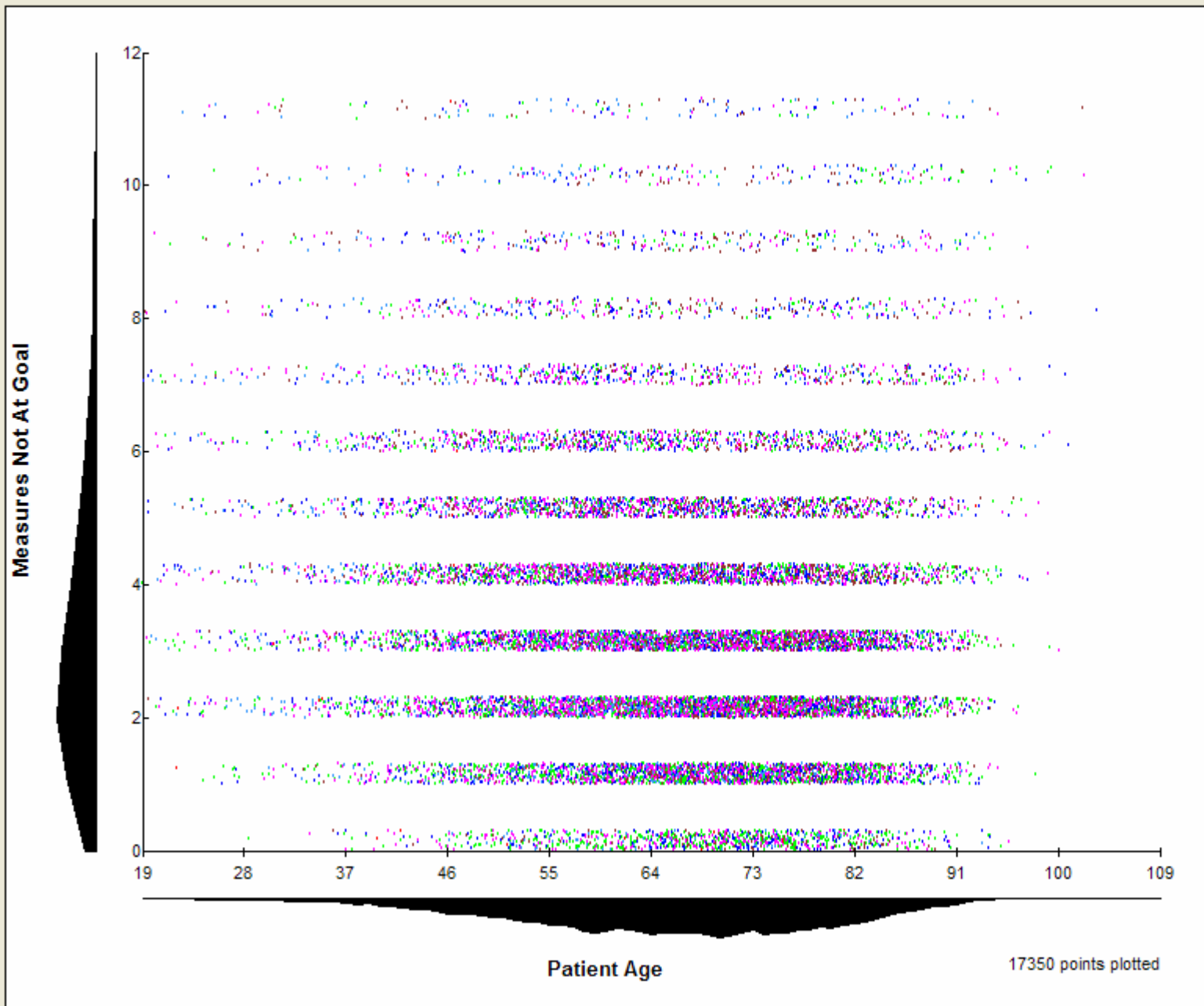
Physician: (All) [v]

Time since last physician encounter (c) 4 3
4 3

Show patients with
Conditions:
 Hypertension
 Diabetes Mellitus
 CHF
 CAD
Combining Rule:
 AND
 OR

Show measures
For the following conditions:
 Hypertension
 Diabetes Mellitus
 CHF
 CAD
Types of measures:
 Process
 Outcome

A	B	C	D	E	F	G	H	I
Disease Condition	Measure_ID	Measure_Name	Measure_Goal	Evaluate	Type			
Hypertension (HTN)	3 OR 6	BP	< 140/90 OR < 130/80	Y	Process and Outcome			
	14	Flu Vaccine	= YES	Y	Process			
	15	Pneumococcal Vaccine	= YES	Y	Process			
Diabetes Mellitus (DM)	6	BP With DM	< 130/80	Y	Process and Outcome			
	7	A1C	< 7	Y	Process and Outcome			
	8	A1C2	< 7	Y	Process			
	9	LDL	< 100	Y	Process and Outcome			
	10	Micro	= Nephropathy or N/A	Y	Process			
	14	Flu Vaccine	= YES	Y	Process			
	15	Pneumococcal Vaccine	= YES	Y	Process			
	20	Foot Exam	> 0	Y	Process			
Congestive Heart Failure (CHF)	3 OR 6	BP	< 140/90 OR < 130/80	Y	Process and Outcome			
	9	LDL	< 100	Y	Process and Outcome			
	13	CHF Care Managed	= YES	Y	Process			
	14	Flu Vaccine	= YES	Y	Process			
	15	Pneumococcal Vaccine	= YES	Y	Process			
	21	LVEF	= YES	Y	Process			
	25	Warfarin Therapy	= YES	Y	Process			
	26	Weight	= YES	Y	Process			
Coronary Artery Disease (CAD)	3 OR 6	BP	< 140/90 OR < 130/80	Y	Process and Outcome			
	9	LDL	< 100	Y	Process and Outcome			



Division: (All)

Department: (All)

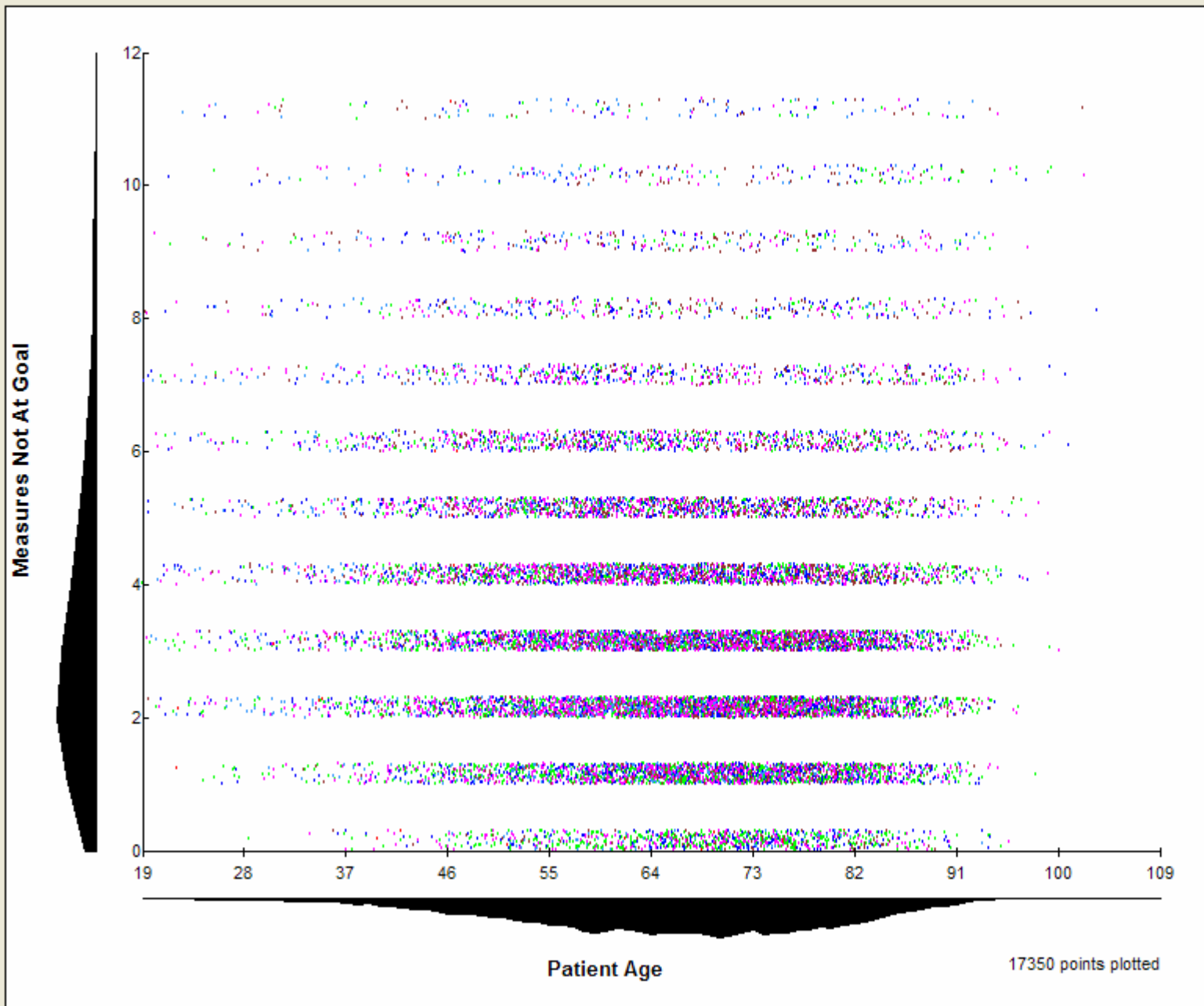
Physician: (All)

Time since last physician encounter (0-4) 3

4 3

- Show patients with Conditions:
- Hypertension
 - Diabetes Mellitus
 - CHF
 - CAD
- Combining Rule:
- AND
 - OR

- Show measures For the following conditions:
- Hypertension
 - Diabetes Mellitus
 - CHF
 - CAD
- Types of measures:
- Process
 - Outcome



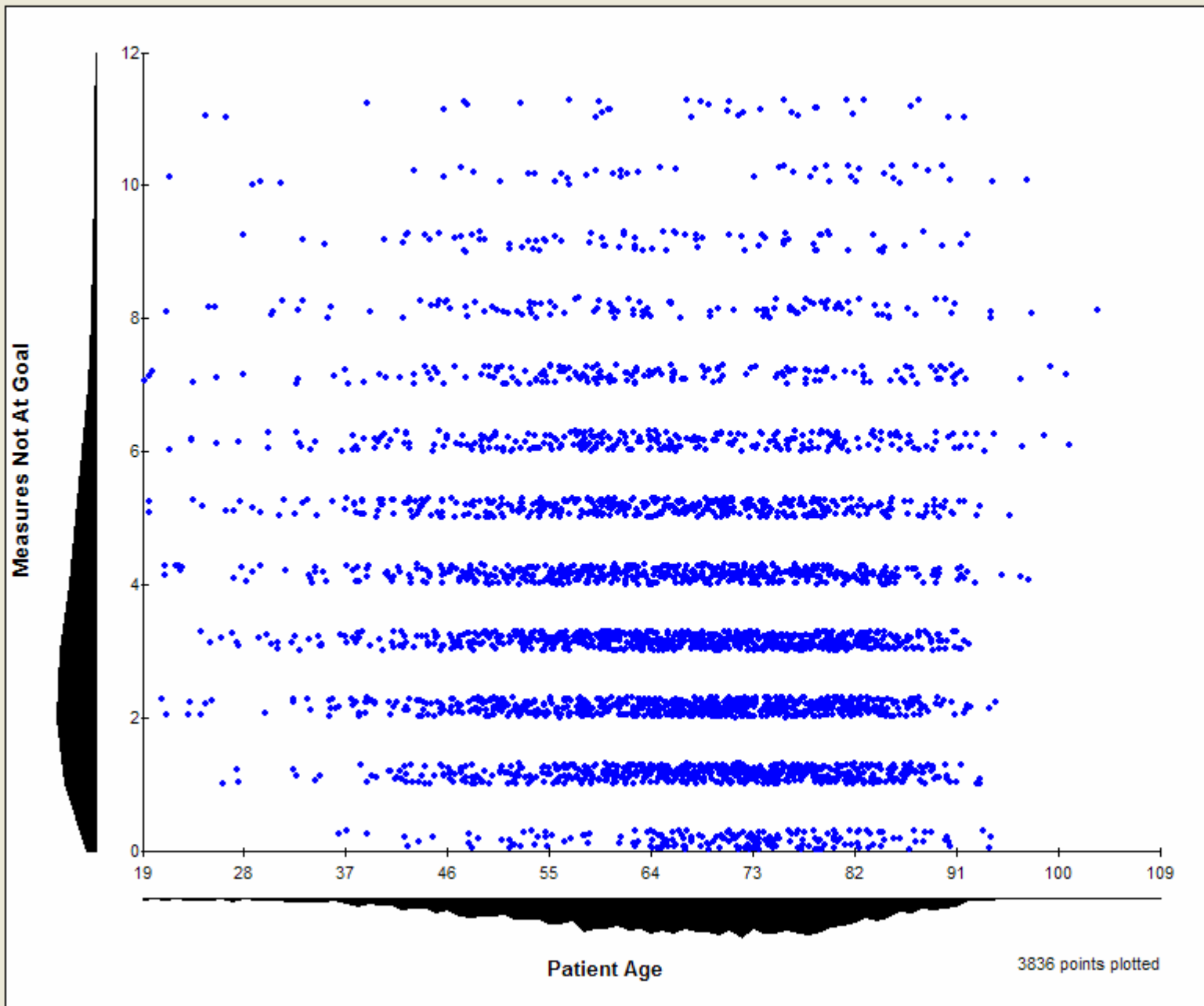
Division:
(All)

- (All)
- Central
- East
- Education
- North
- Northwest
- West

Time since last physician encounter (0
4 3
4 3

Show patients with
Conditions:
 Hypertension
 Diabetes Mellitus
 CHF
 CAD
Combining Rule:
 AND
 OR

Show measures
For the following conditions:
 Hypertension
 Diabetes Mellitus
 CHF
 CAD
Types of measures:
 Process
 Outcome



Division: Northwest

Department: (All)

Physician: (All)

Time since last physician encounter (days): 4 to 3

Show patients with Conditions:

- Hypertension
- Diabetes Mellitus
- CHF
- CAD

Combining Rule:

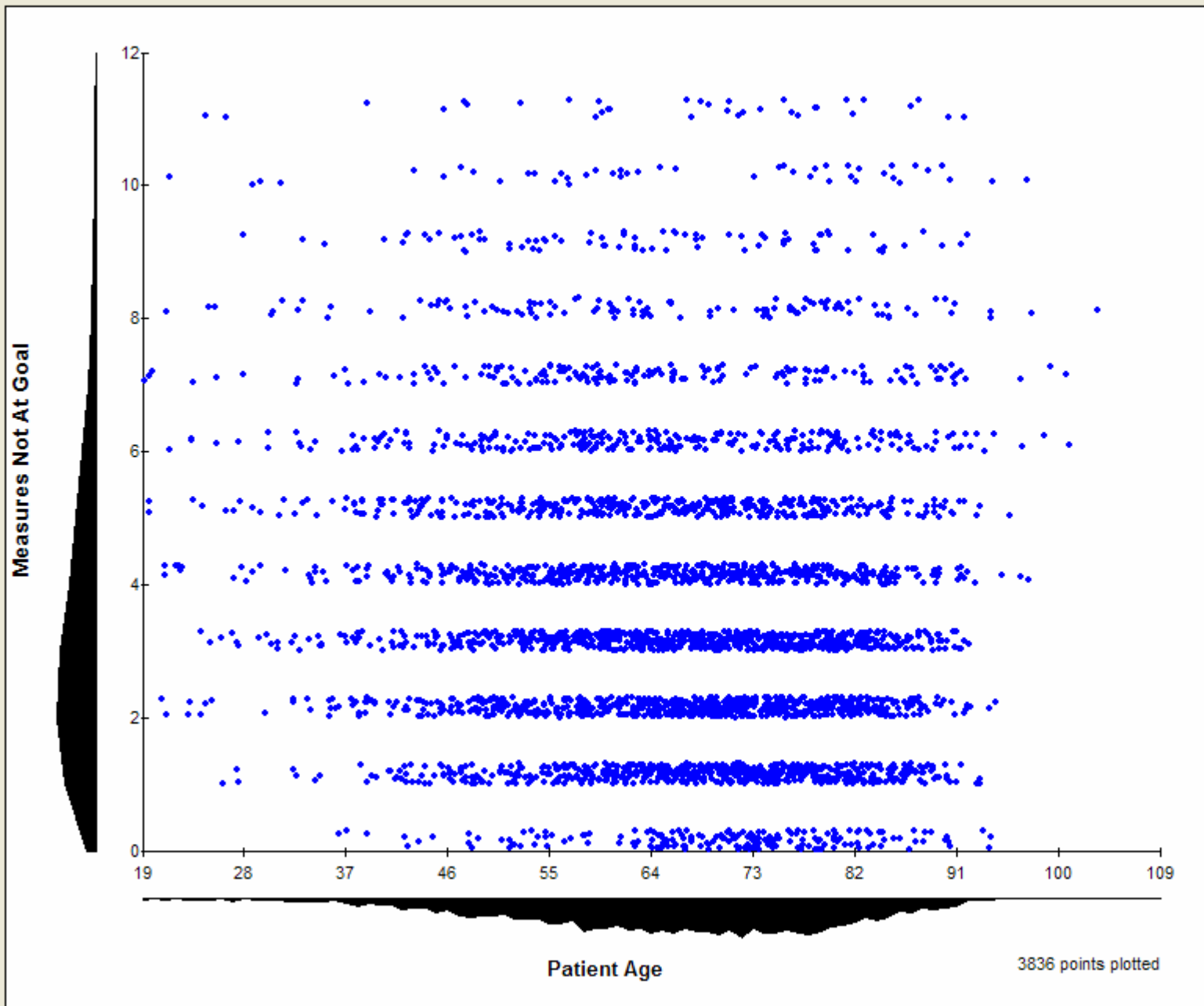
- AND
- OR

Show measures For the following conditions:

- Hypertension
- Diabetes Mellitus
- CHF
- CAD

Types of measures:

- Process
- Outcome



Division:
Northwest

Department:
[All]

- [All]
- CADOTT_CENTER
- CHETEK_LAKE_COUNTRY_C
- CHIPPEWA_FAMILY_PRACTIC
- CHIPPEWA_INTERNAL_MEDI
- CORNELL_CENTER
- INDIANHEAD_FAMILY_PRACT
- INDIANHEAD_INTERNAL_ME

Show patients with

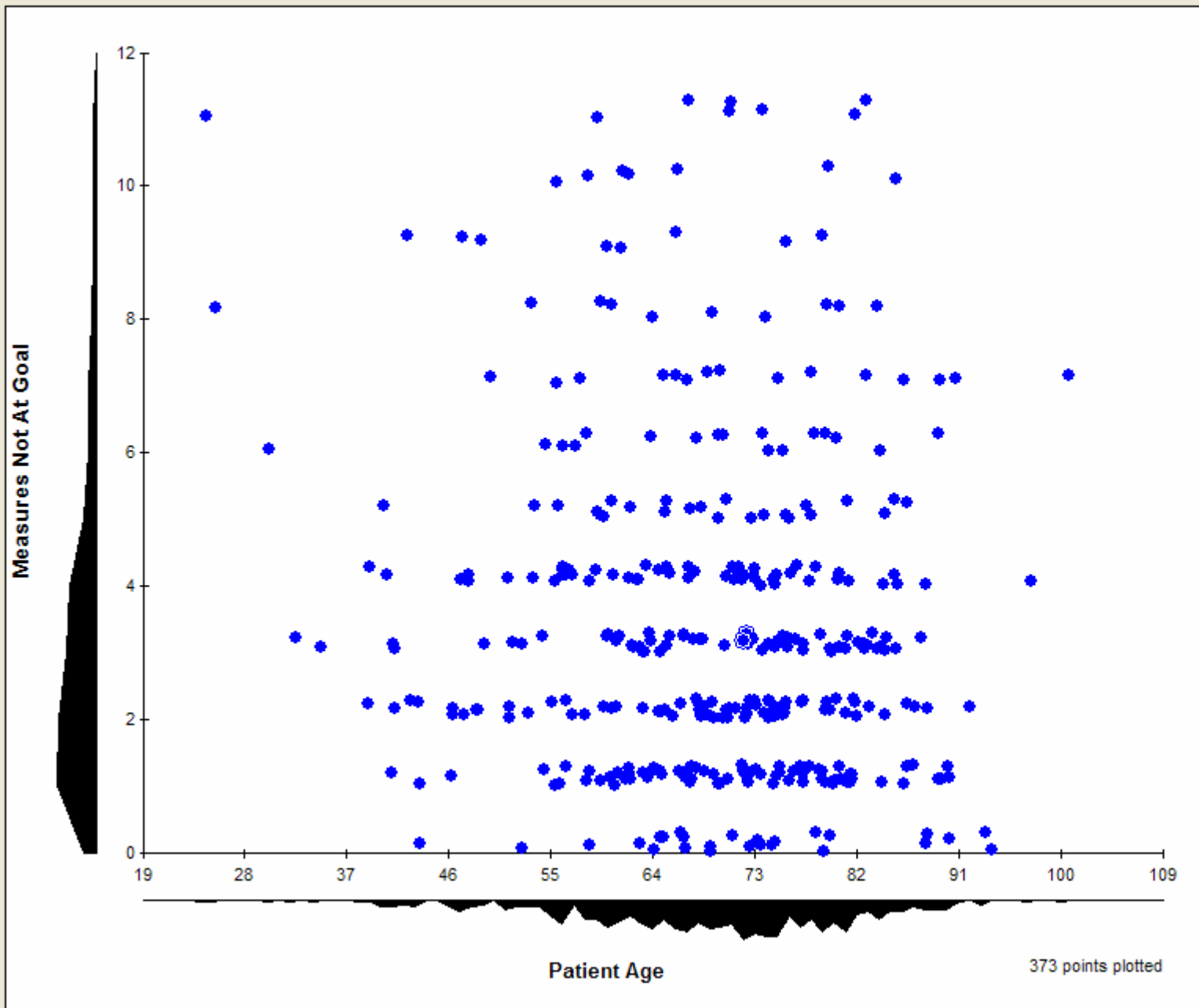
- Conditions:
- Hypertension
 - Diabetes Mellitus
 - CHF
 - CAD

Combining Rule:
 AND
 OR

Show measures

- For the following conditions:
- Hypertension
 - Diabetes Mellitus
 - CHF
 - CAD

Types of measures:
 Process
 Outcome



Division: Northwest

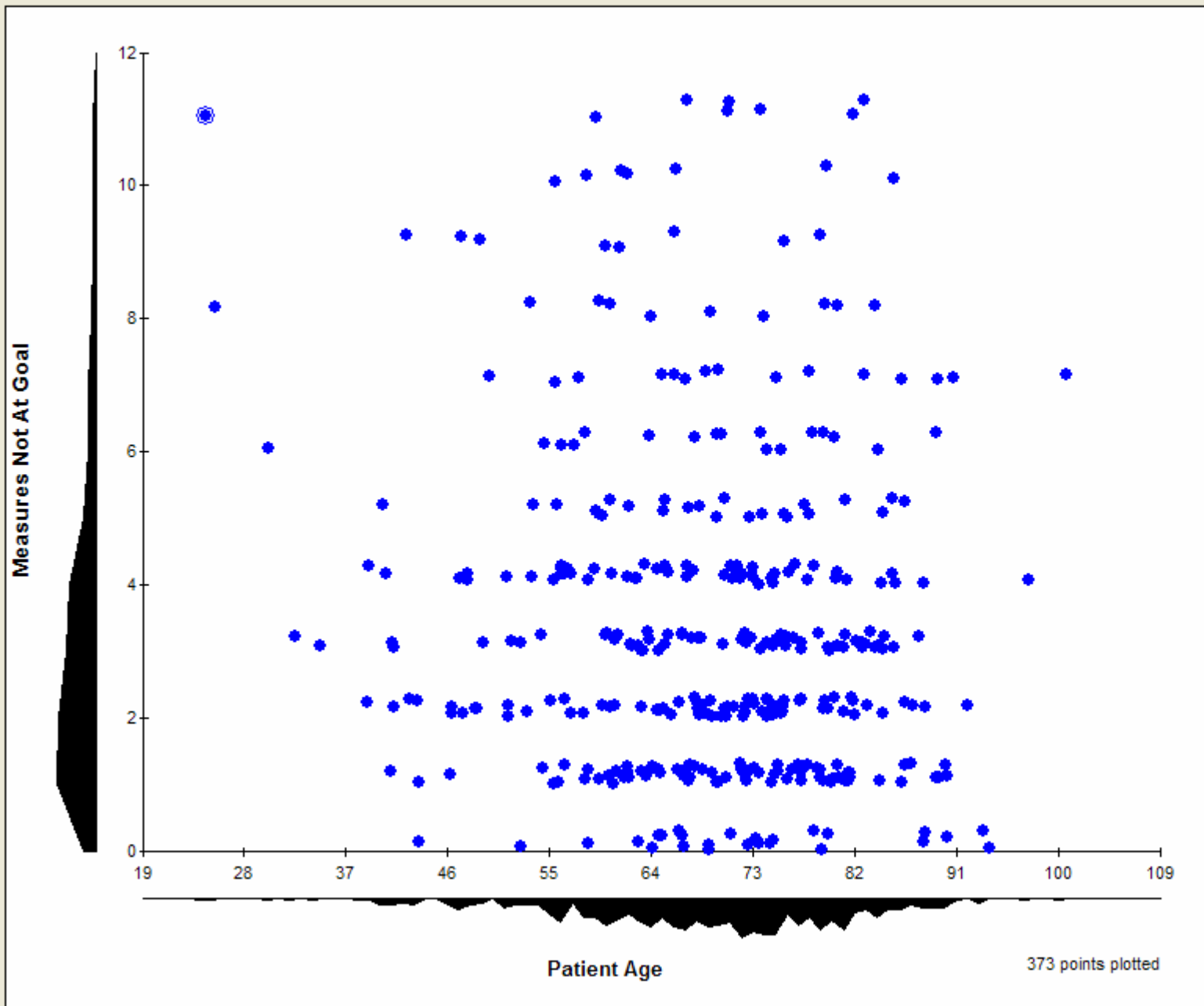
Department: INDIANHEAD_INTERNAL_ME

Physician: [All]

Time since last physician encounter (days): 4 to 30

- Show patients with
- Conditions:
- Hypertension
 - Diabetes Mellitus
 - CHF
 - CAD
- Combining Rule:
- AND
 - OR

- Show measures
- For the following conditions:
- Hypertension
 - Diabetes Mellitus
 - CHF
 - CAD
- Types of measures:
- Process
 - Outcome



Division:
Northwest

Department:
INDIANHEAD_INTERNAL_ME

Physician:
(All)

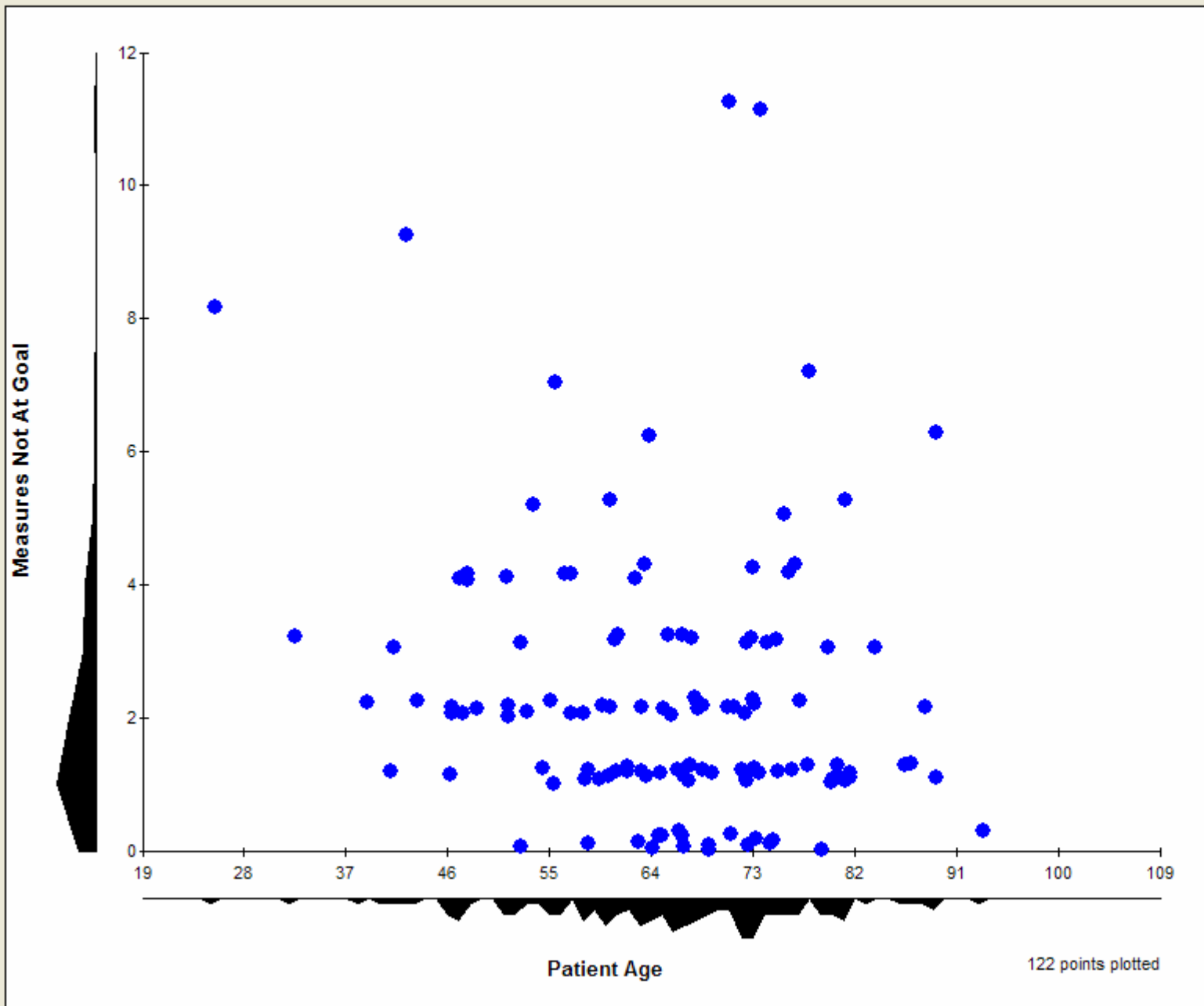
- (All)
- Physician 26571
- Physician 26582
- Physician 59806
- Physician 70398
- Physician 81774

- Conditions:
- Hypertension
 - Diabetes Mellitus
 - CHF
 - CAD

- Combining Rule:
- AND
 - OR

- Show measures
- For the following conditions:
- Hypertension
 - Diabetes Mellitus
 - CHF
 - CAD

- Types of measures:
- Process
 - Outcome



Division: Northwest

Department: INDIANHEAD_INTERNAL_ME

Physician: Physician 59806

Time since last physician encounter (days): 4

Show patients with Conditions:

- Hypertension
- Diabetes Mellitus
- CHF
- CAD

Combining Rule:

- AND
- OR

Show measures For the following conditions:

- Hypertension
- Diabetes Mellitus
- CHF
- CAD

Types of measures:

- Process
- Outcome

Details ✖

Patient 22411
 Age: 71.0 years
 Last seen 295 days ago
 Division: Northwest
 Department: INDIANHEAD_INTERNAL_MEDICINE
 Physician: 59806
 Total measures not at goal: 11
 Patient is being treated for:
 - Diabetes Mellitus (11 measures not at goal)

Close

Division: Northwest

Department: INDIANHEAD_INTERNAL_ME

Physician: Physician 59806

Time since last physician encounter (days): 4

Show patients with Conditions:

- Hypertension
- Diabetes Mellitus
- CHF
- CAD

Combining Rule:

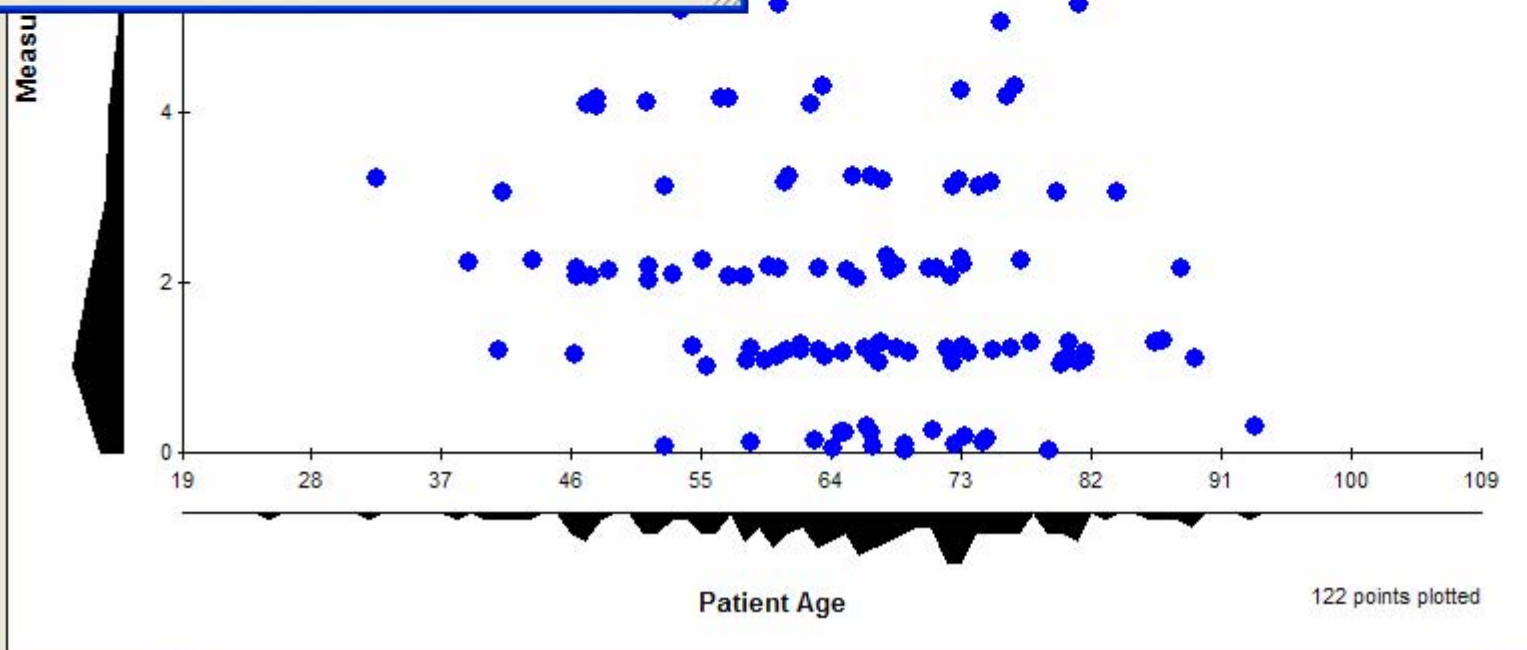
- AND
- OR

Show measures For the following conditions:

- Hypertension
- Diabetes Mellitus
- CHF
- CAD

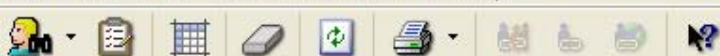
Types of measures:

- Process
- Outcome



A stylized graphic featuring three hands in shades of brown, holding a large cross. The hands are positioned at the bottom and sides of the cross, with fingers pointing upwards. The cross is a simple, bold outline. The background is a solid brown color with some faint, thin lines and shapes, including a large, faint cross-like shape in the upper right corner.

Data - My Practice



Penniman as of 10/13/2007 (Total Patients: 164)

Name (MHN)	Conditions	CHF	DM	HTN	Measures NOT at Goal	Next Appt. Pers. Prov.
Lexotis, Xjtipzh M (8708604)	3	✓	✓	✓	5 / 6	-
Xthhrzinjz, Aziizlg J (873542)	3	✓	✓	✓	4 / 6	10/16/2007
Ajyzvzj, Htmmzz J (202994)	3	✓	✓	✓	4 / 6	-
Tmrjevgl, Cfspz (8317258)	3	✓	✓	✓	3 / 6	02/05/2008
Mtpjfhz, Tjlgj Z (280750)	3	✓	✓	✓	3 / 6	12/03/2007
Wtiv, Afy L (8755827)	3	✓	✓	✓	3 / 6	10/17/2007
Xjtiamei, Tmti M (843086)	3	✓	✓	✓	2 / 6	-
Xjtiamei, Ctkzh C (8742767)	3	✓	✓	✓	1 / 6	03/11/2008
Otilt, Zyzviz O (8734505)	3	✓	✓	✓	1 / 6	10/15/2007
Xjznzm, Vys O (945119)	2	-	✓	✓	4 / 5	10/15/2007
Ntgmaz, Zmteiz Z (069366)	2	-	✓	✓	3 / 5	10/18/2007
Zwzihfi, Btljepet (21110)	2	-	✓	✓	3 / 5	11/05/2007
Vits. Vzfviz N (8005977)	2	-	✓	✓	3 / 5	11/12/2007

Patient Detail
Worklist Detail

Tmrjevgl, Cfspz (8317258)

- Conditions List**
- Hypertension (HTN)
 - Diabetes Mellitus (DM)
 - Congestive Heart Failure (CHF)

Quality Measures	Value	Service Date w/in Last Year	Action Required
Blood Pressure with Diabetes	136/58	10/05/07	consult provider
Hemoglobin A1C	7.0	10/05/07	consult provider
Fasting Lipid Profile (LDL)	120	06/05/07	consult provider
Microalbumin / Evidence of Nephropathy	nephropathy	10/05/07	none
CHF Care Managed	yes	-	none
Foot Exams within last year	1	06/05/07	none

Intervention Log [add | modify | details]

Date	Action	Comments	Population
09/11/2007	Appointment Already Exists	10/1/07 pt scheduled for labs and appt scheduled for a 4 month DM F/U on 10/5/07.	Quality Care Metrics Not at Goal
05/17/2007	Letter Sent		Quality Care Metrics Not at Goal
01/26/2007	Appointment Already Exists	appt on 02.02.07	Quality Care Metrics Not at Goal
01/17/2007	Appointment Already Exists	appt on 01.17.07	Quality Care Metrics Not at Goal
12/04/2006	Appointment Already Exists	labs on 01.15.07 and appt on 01.17.07	Quality Care Metrics Not at Goal
11/21/2006	Appointment Already Exists	labs on 01.15.07 and appt on 01.17.07	Quality Care Metrics Not at Goal
05/30/2006	Appointment Scheduled	micral and aic ordered in August	Quality Care Metrics Not at Goal

A stylized graphic featuring three hands in shades of brown and tan, holding a large cross. The hands are positioned as if supporting the cross from below. The text "Data - My Patient" is overlaid in the center in a bold, yellow, sans-serif font. The background consists of various geometric shapes and lines in shades of brown and tan, creating a complex, layered effect.

Data - My Patient

PROPRIETARY/CONFIDENTIAL
INFORMATION OF MARSHFIELD CLINIC



Problems [Expand]

Last Dx'd	Description
04/05/07	Amiodarone hyperpigmentation [709.09 E942.0] - (CMR)
04/03/07	11-beta-hydroxylase [255.2] - (CMR)
03/19/07	Atrial fibrillation [427.31] - (CMR)
02/27/07	Anticoagulation [V58.61] - (CMR) Mitral valve replacement [porcine follow-up surgical surveillance V4: Amiodarone therapy [V58.69] - (CMR)
02/26/07	Cataract(s), nuclear [366.16] - (CMR)

Allergies/Adverse Reactions - Clinical Alerts [Expand]

Drug (Verified 09/06/2007 By Moin, Amy M)
No Known Drug Allergies/Adverse Reactions (NKDA)

Non-Drug (Verified 09/06/2007 By Moin, Amy M)
No Known Non-Drug Allergies/Adverse Reactions (NKNDA)

Clinical Alerts
Family history alert
-- [cancer, colon \[V16.0\]](#) [Dr Test Dev MD \(08/23/04\)](#)

	DUE	Previous Service
HepB	OVERDUE	05/01/07
Pneumococcal	OVERDUE	-
Urine Microalbumin Test	OVERDUE	03/17/05
Hemoglobin A1c	OVERDUE	08/10/05
Eye Exam	OVERDUE	12/12/05
Comprehensive Foot Exam	OVERDUE	02/02/05
Flu	DUE	-
Prevention		
HepB	OVERDUE	05/01/07
Td(Adult)	08/23/16	08/23/06
Flu	DUE	-
Pneumococcal	OVERDUE	-
Early Detection		
Colonoscopy	01/31/16	01/31/06
Mammogram	11/14/07	11/14/06
Pap Smear	06/05/10	06/05/07
Fasting Lipid Profile	10/26/07	10/26/06
Diabetes Type 2		
Fasting Lipid Profile	10/26/07	10/26/06
Urine Microalbumin Test	OVERDUE	03/17/05
Hemoglobin A1c	OVERDUE	08/10/05
Eye Exam	OVERDUE	12/12/05
Comprehensive Foot Exam	OVERDUE	02/02/05
Flu	DUE	-
Pneumococcal	OVERDUE	-

Active Medications [Expand]

Last Updated

- 04/05/07 **Calcium Carbonate-Vitamin D2 (Calcium 500 - Vitamin D®)** 500-200mg-unit Tab...
- 04/05/07 **Dofetilide (Tikosyn®)** 125mcg Capsule 1 Capsule(s) (125 mcg) by mouth twice daily
- 04/05/07 **Furosemide** 20mg Tablet 1 Tablet(s) (20 mg) by mouth daily in the morning
- 04/05/07 **Potassium Chloride** 10mEq Tablet Sustained Release 2 Tablet(s) (20 mEq) once daily T...
- 07/20/06 **Simvastatin (Zocor®)** 80mg Tablet 1 Tablet(s) (80 mg) once daily
- 04/05/07 **Vitamin E** 800unit Capsule 1 Capsule(s) (800 unit) by mouth once daily
- 02/06/07 **Warfarin (Coumadin®)** 2.5mg Tablet 1 Tablet(s) (2.5 mg) once daily

Appointments (Last seen in INTERNAL MED on 04/05/2007) [Expand]

Past

Vitals [View] [Expand]

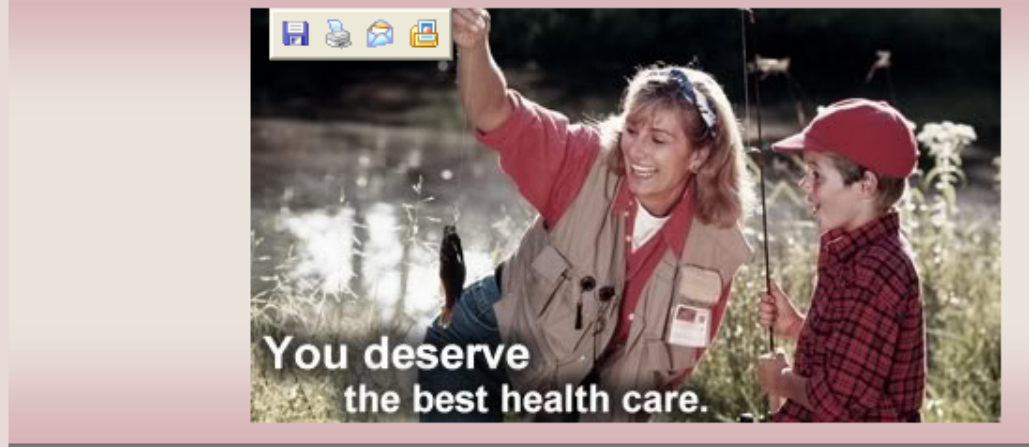
04/05/07	Blood Pressure 144/78 mm Hg
04/05/07	Body Mass Index 28.3 kg/m ²
04/05/07	Height 152.40 cm (60.00 in)

A stylized graphic featuring three hands in shades of brown, holding a large cross. The hands are positioned as if supporting the cross from below. The cross is also in shades of brown. The text "Data - The Patient" is overlaid in the center in a bold, yellow font. The background is a solid brown color with some faint, thin lines and shapes.

Data - The Patient

Patients & Visitors Home

- [Find a Doctor or Other Medical Professional](#)
- [Request Appointment](#)
- [Refill Prescription](#)
- [Order Contacts](#)
- [Services](#)
- [Our Locations](#)
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- [Patient Rights](#)
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online health management

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MARSHFIELD CLINIC



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My Marshfield Clinic Welcome

Appointments

Health Summary

Health Reminders

Allergies/Adverse Reactions

Vitals

Test Results

Immunization Records

Growth Charts

Financial Services

Patient Forms & Online Services

Personal Profile

Refill Prescription

Order Contacts

Security Health Online

Logout

[Home](#) > [Health Summary](#) > [Health Reminders](#)



Health Summary

Health Reminders

Through prevention, early detection and disease management, you can live a longer, healthier life. Please schedule any overdue or coming due services at your earliest convenience.

Please note the services listed below may already be scheduled. The purpose of the schedule is to remind you to schedule these services if you have not already scheduled them. If you have recently had an appointment for any of the services listed below, please allow a few days for the schedule to be updated.

If you have any questions or concerns regarding scheduling an appointment for one or more of these services, please contact your personal provider.

Health Reminders [Help](#)

Select patient:
 Personal Provider: Commercialization, Is MD

[Overdue](#) | [Coming Due](#)

Request Appointment	Overdue Services	Status	Last Service Date
<input type="checkbox"/>	Colonoscopy	Overdue	09/18/1995
<input type="checkbox"/>	Urine Microalbumin Test	Overdue	06/01/2006
<input type="checkbox"/>	Td(Adult)	Overdue	
<input type="checkbox"/>	Flu	Overdue	
<input type="checkbox"/>	Pneumococcal	Overdue	

- My Marshfield Clinic Welcome
- Appointments
- Health Summary**
- Health Reminders
- Allergies/Adverse Reactions
- Vitals
- Test Results**
- Immunization Records
- Growth Charts
- Financial Services
- Patient Forms & Online Services
- Personal Profile
- Refill Prescription
- Order Contacts
- Security Health Online
-

[Home](#) > [Health Summary](#) > [Test Results](#)



Health Summary

Test Results

Use the links under test column to learn more about individual tests. A lab value marked with an "*" indicates that we are presently unable to report a value. A limited number of tests are being displayed below. Only test results ordered after January 1, 2004 will appear. Additional test results will be added in the future.

Test results will be posted within 10 days.

If you have any questions or concerns regarding your test results, please contact your provider.

Test Results [Help](#)

Select patient:

Personal Provider: Commercialization, Is MD [i](#)

Results 1 - 5 of 5

Date	Test	Value	Normal Range
9/15/2006	LDL	96	80-130 mg/dL
9/15/2006	Hemoglobin A1C	8.6	4.0-6.0 %
9/15/2006	HDL	57	40-59 mg/dL
9/15/2006	Triglycerides	93	20-149 mg/dL
9/15/2006	Total Cholesterol	172	100-200 mg/dL

- Appointments
- Health Summary**
- Health Reminders
- Allergies/Adverse Reactions
- Vitals
- Test Results**
- Immunization Records
- Growth Charts
- Financial Services
- Patient Forms & Online Services
- Personal Profile
- Refill Prescription
- Order Contacts
- Security Health Online
- Logout**

Health Summary

Test Results

Hemoglobin A1c

Hemoglobin A1c is a blood test to help control your diabetes. Your blood glucose (sugar) levels change during the day. These levels change depending on what you eat, and how much you eat. It also depends on the amount of exercise or activity you do, and on your level of stress. A blood glucose level tells what your sugar is at the moment of the test. This information is very important, but it does not give a true picture of blood sugar control. An HbA1c blood test tells what the average blood sugar was during the past 2 or 3 months.

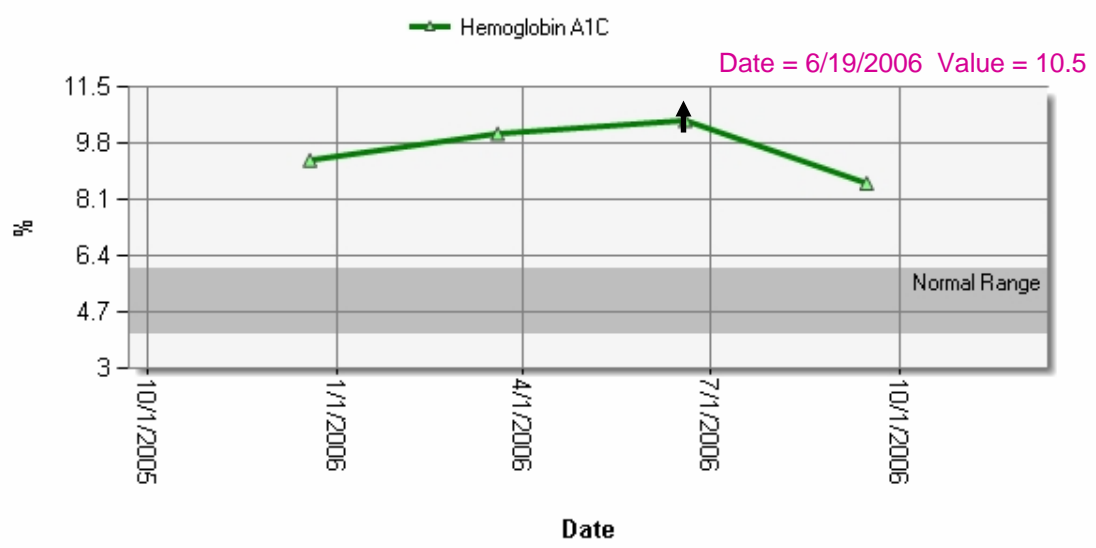
Test results will be posted within 10 days. If you have questions or concerns regarding your test results, please contact your personal provider.

Test History [Help](#)

Patient: DEMONSTRATION, THEODORE COMM
Graphing: 15 most recent results.

[Graph View](#) | [Table View](#) | [Test Results](#) | [Hemoglobin A1C Information](#)

From To
OR
 15 Most recent values



A stylized graphic in shades of brown and black. It features three hands, each with a white outline, holding a large cross. The hands are positioned at the bottom corners of the cross, with their fingers pointing upwards. The background consists of various geometric shapes and lines in different shades of brown, creating a layered, abstract effect.

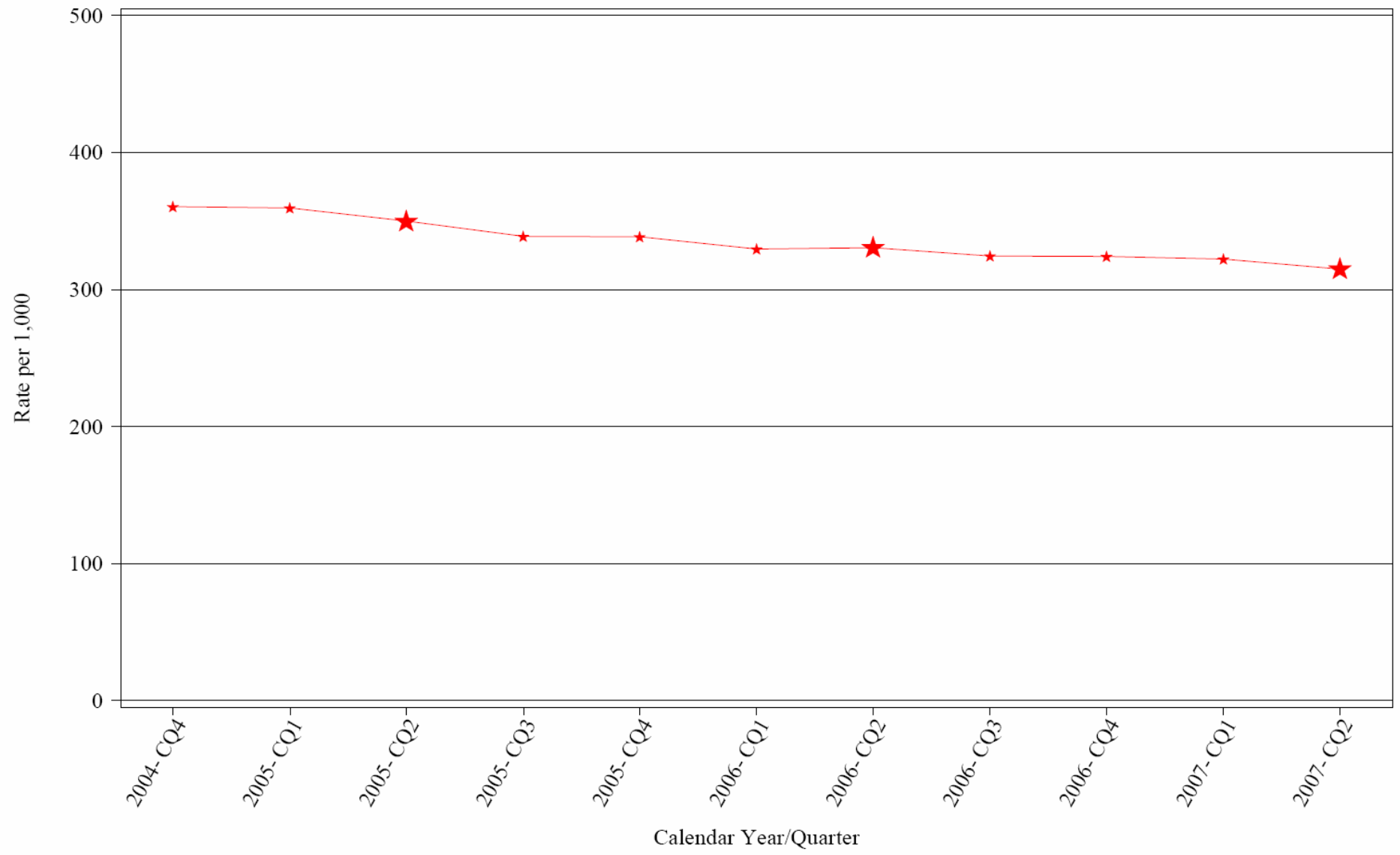
Results

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INFORMATION OF MARSHFIELD CLINIC

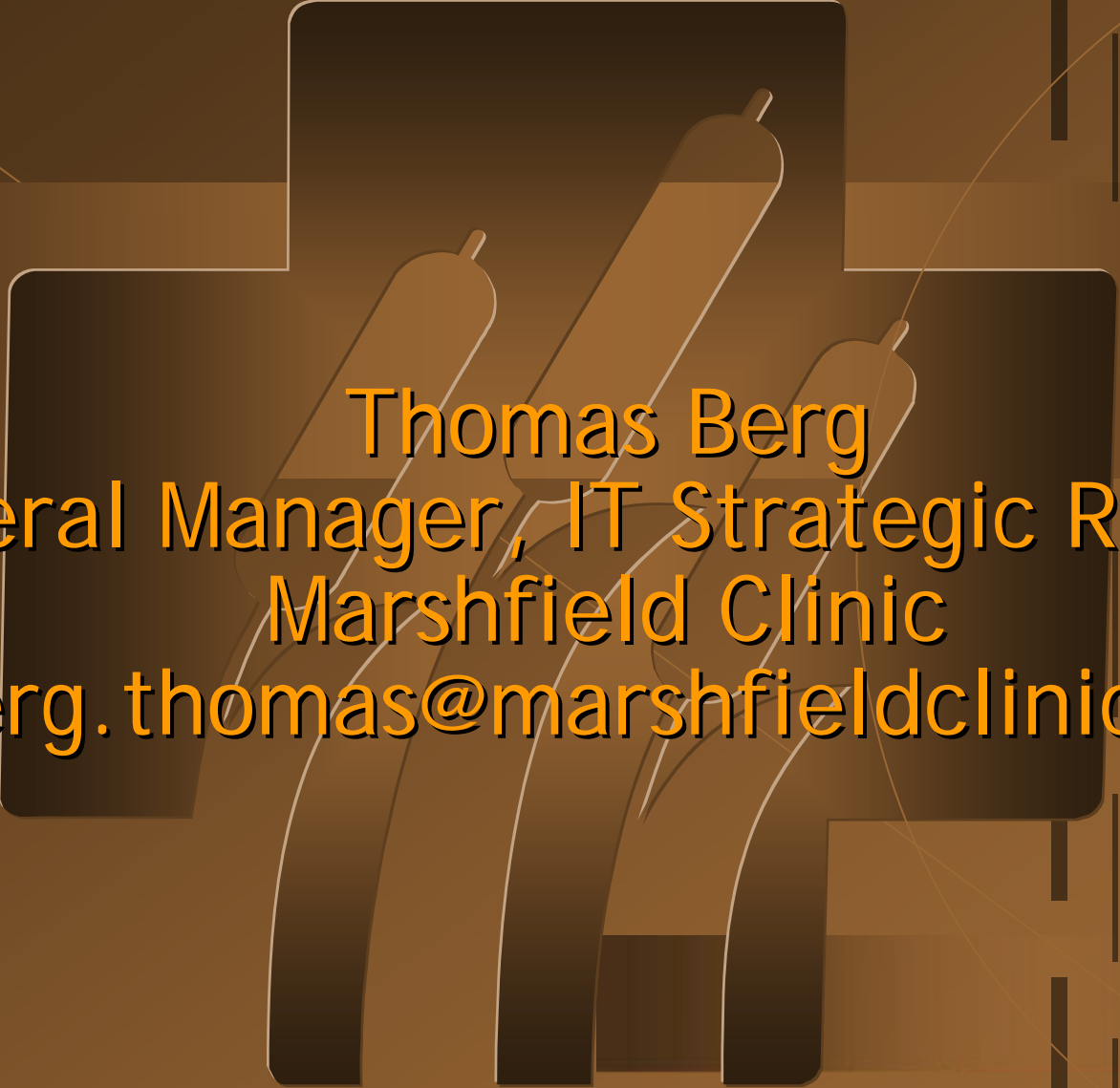


Marshfield Clinic
System
Diabetes Mellitus Quality Measures
All Cause Hospitalizations

★ ★ ★ Marshfield Clinic



Note1: Enlarged symbols represent mutually exclusive time periods.

A stylized graphic in shades of brown and tan. It features three hands, one in the center and two on the sides, reaching upwards to hold a large, dark brown cross. The hands are rendered with simple outlines and some shading to suggest depth. The background is a solid, medium-brown color with some faint, thin lines and a subtle grid pattern.

Thomas Berg
General Manager, IT Strategic Relation
Marshfield Clinic
berg.thomas@marshfieldclinic.org