



Remote Telemonitoring for Heart Failure Patients

Community Roundtable, 11/5/07
Heather Watson, MBA/HCM

Why Focus on Heart Failure?

**Top 25 DRGs Statewide
Based on Number of Discharges**

DRG Code	DRG Description	# of Discharges	# of Valid Charges	Average Charge Per Stay*	Estimated Average Charge Per Day	Average Length of Stay
391	NORMAL NEWBORN	419,810	372,054	2,888	1,431	2.0
373	VAGINAL DELIVERY W/O COMPLICATING DIAGNOSES	316,940	280,601	10,832	5,489	2.0
430	PSYCHOSES	163,796	161,763	17,726	1,928	9.2
371	CESAREAN SECTION W/O CC	131,704	120,243	20,724	5,963	3.5
127	HEART FAILURE & SHOCK	86,790	75,939	34,908	6,568	5.3
088	SIMPLE PNEUMONIA & PLEURISY AGE >17 W CC	78,770	68,973	34,698	6,260	5.5
209	MAJOR JOINT & LIMB REATTACHMENT PROCEDURES OF LOWER EXTREMITY	76,159	64,567	66,592	15,773	4.2
143	CHEST PAIN	70,285	62,652	15,498	9,007	1.7
390	NEONATE W OTHER SIGNIFICANT PROBLEMS	68,920	59,768	7,234	2,704	2.7
462	REHABILITATION	55,139	53,999	49,032	3,012	16.3
416	SEPTICEMIA AGE >17	52,180	44,202	67,499	8,721	7.7
088	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	50,064	44,137	30,656	5,951	5.2
014	INTRACRANIAL HEMORRHAGE OR CEREBRAL INFARCTION	48,253	41,099	44,089	7,690	5.7
182	ESOPHAGITIS, GASTROENTERITIS & MISC DIGEST DISORDERS AGE >17 W CC	44,985	38,725	27,039	6,558	4.1
359	UTERINE & ADNEXA PROC FOR NON-MALIGNANCY W/O CC	42,784	36,866	26,855	11,211	2.4
174	GASTROINTESTINAL HEMORRHAGE W CC	40,488	34,865	32,851	7,956	4.1
372	VAGINAL DELIVERY W COMPLICATING DIAGNOSES	38,084	30,949	15,078	5,874	2.6
320	KIDNEY & URINARY TRACT INFECTIONS AGE >17 W CC	34,512	30,470	27,718	5,715	4.9
527	PERCUTANEOUS CARDIOVASCULAR PROC W DRUG ELUTING STENT W/O AMI	34,136	33,117	70,734	35,624	2.0
296	NUTRITIONAL & MISC METABOLIC DISORDERS AGE >17 W CC	32,410	28,569	27,317	5,887	4.6
370	CESAREAN SECTION W CC	31,714	26,843	28,352	6,258	4.5
316	RENAL FAILURE	30,751	26,328	43,120	6,580	6.6
277	CELLULITIS AGE >17 W CC	26,959	24,273	28,255	5,132	5.5
138	CARDIAC ARRHYTHMIA & CONDUCTION DISORDERS W CC	26,707	22,491	27,350	7,666	3.6
475	RESPIRATORY SYSTEM DIAGNOSIS W VENTILATOR SUPPORT	26,415	23,668	162,780	9,953	16.4

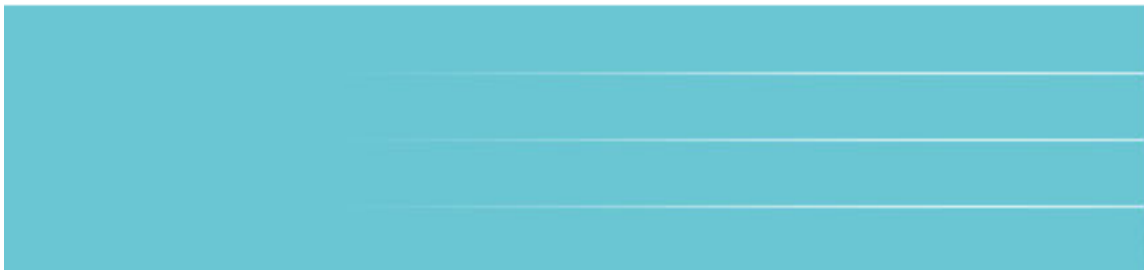
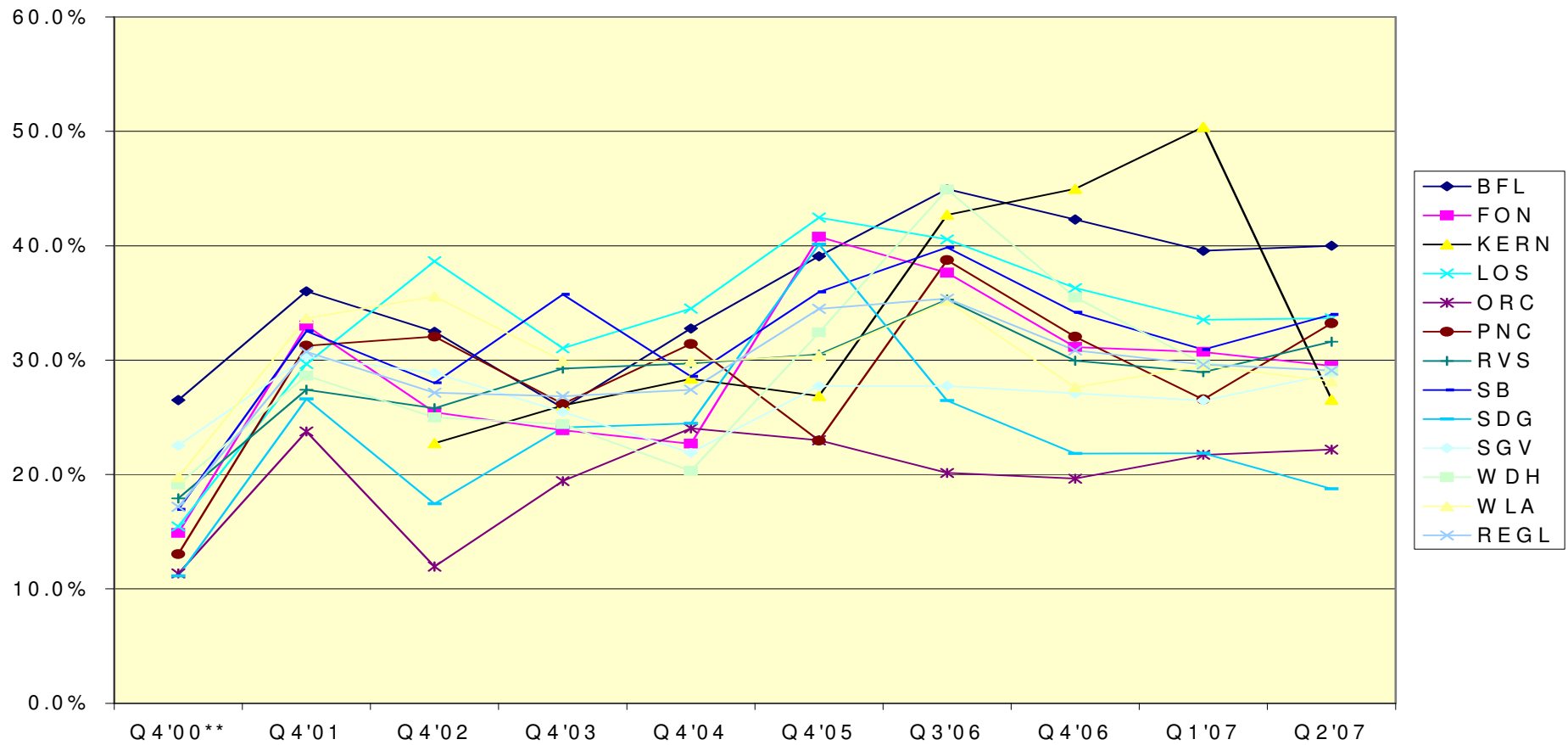
Data Source: Patient Discharge Data 2005 (MIRCa) Office of Statewide Health Planning and Development (OSHPD) November 2006

* This figure has been adjusted for Kaisers, Shriners, and other hospitals that do not report charges



The Problem

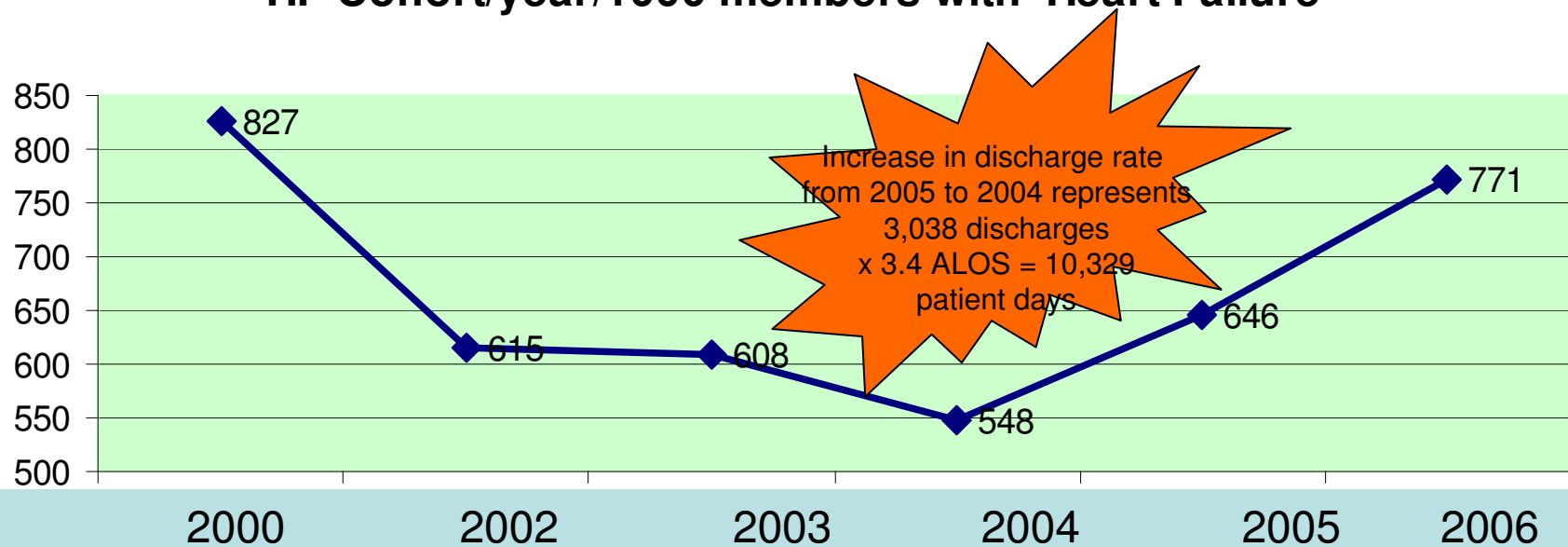
Variation over Time within Medical Centers (Any readmission at 90 days)



The Problem

Discharge Rates are Rising

Inpatient Discharge For Any Reason Among the entire CMI, HF Cohort/year/1000 members with Heart Failure



Source: CMI DATA
Cohort 30,000

Calculations: Total inpatient days = 10,329. $646 - 548 = 98$ discharges per 1000 members with CF. Have 31,000 with CF, so $31 \times 90 = 3,038$ discharges $\times 3.4$ ALOS = 10,329 patient days
10,329 patient days = per day at each medical center. $861 = 10,329 / 12$ medical centers. 2.359 patient days = $861 / 365$ days per yr.



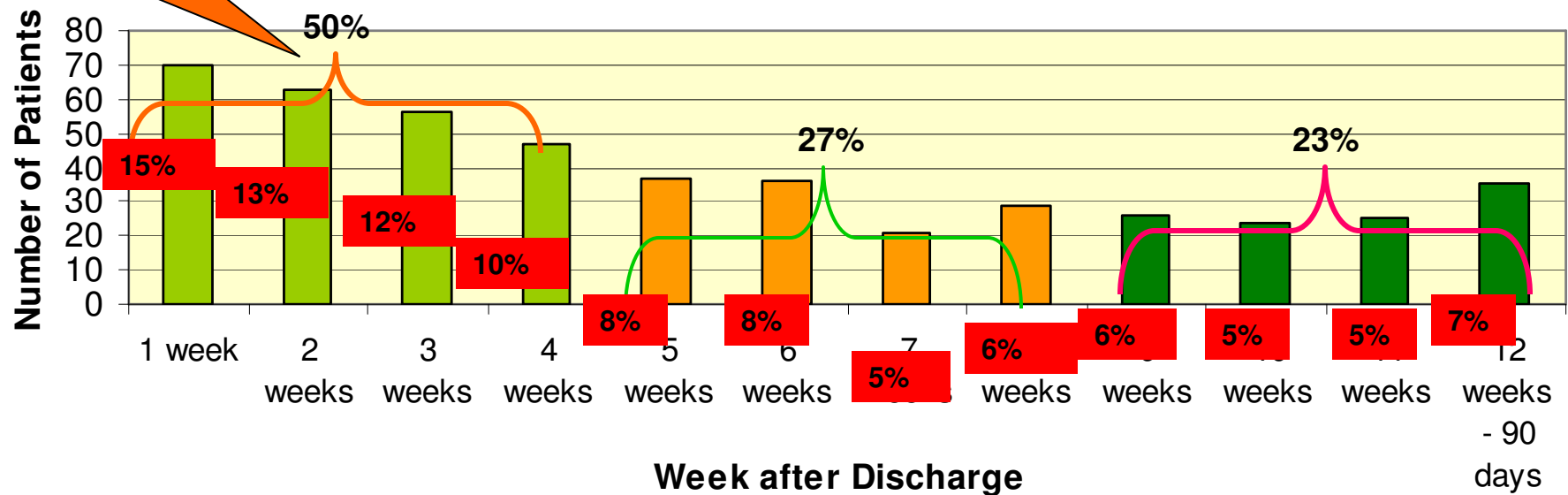
The Problem

Of those members readmitted, 50% are readmitted within the first 30 days of discharge



Follow up must be timely!

Time after Discharge that Patients are Readmitted (Number of Patients by Week Post Discharge)



Source: PAS, CHF_Hosp_Utilization, Patient count based on number of days to readmission for HF (run date = 5/26/06), MAS Consulting Analysis



The Solution

Heart Failure Transitional Care Program



Transitional Care System

Inpatient Care Manager

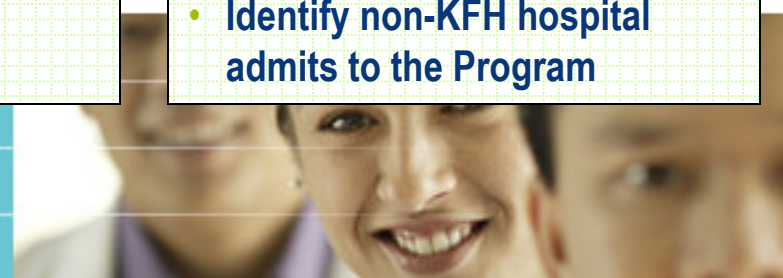
- **Assessment within 48 hours of hospital admission**
- **Survival skills education**
- **Discharge planning**
- **Coordination with Home Health/outpatient Care Manager**
- **Facilitate referrals to Palliative care /Hospice**
- **Ensure compliance with JCAHO HF bundle**

Home Health Nurse

- **Telephone contact within 24 hours**
- **Home visit within 48 hours of discharge for selected patients**
- **Coordination with outpatient care manager or referral to palliative care**
- **Special training to ensure effectiveness of home health visit/evaluation**

Outpatient Care Manager

- **Up to six months, intensive post discharge follow-up**
- **Optimize medications**
- **Coordinate access to medical and palliative care**
- **End of Life care planning**
- **Disease and self management education**
- **Inbound phone support and advice available 24/7 (in progress)**
- **Remote care monitoring for selected patients**
- **Identify non-KFH hospital admits to the Program**



Our Experience with Remote Telemonitoring



- **2004 Pilot with Health Buddy and Phillips**
- **2006 Pilot with Honeywell HomMed**



2006 Pilot Description

- Six month pilot
- 150 [Honeywell/HomMed Genesis](#) remote monitoring devices
- Four participating sites: Panorama City and Lancaster, Riverside, Kern County
- Fifty devices at each location
Standard peripherals include b/p cuff, weight scale, O2 sat, also available are glucose monitor, peak flow, and PT/INR.
- Daily transmission of clinical data from patient homes to care manager computers



Program Structure / Staffing

PharmD or RN Care Managers monitor daily vitals, identify patients for program, Clerk (recommended) to support program triage phone calls; send letters, create referrals & book appointments,

- generate e-referrals, order labs
- mail/screen depression screening PHQ-9
- assist in enrolling and dis-enrolling process of members in telemonitoring pilots
- assist in delivering patient education materials, order charts
- looking up labs to make them available to the pharmacist
- assist in maintaining active heart failure care management registry

Project Manager (regional) for project oversight, reporting, and contracting

Space requirements: Stand alone workstation is located in care manager office

Sample Case Load: 0.7 PharmD care manager manages 50 remote telemonitoring patients

Installation accomplished via contracted home health agency through vendor



**In Riverside, Panorama City, and Lancaster the
Care Managers reside in Cardiology**

**In Kern County, the RN Care Manager resides
in Population Care Management**



Identification and recruitment of patients for program

Daily monitoring of clinical data from patient homes to care manager computers

Triage of data and follow-up with appropriate patients

Communication with PCP or Cardiologist

Exiting patients from the program



Patients are identified/referred to the program by the HF Care Manager

Device is installed by outside agency and training is provided on daily use of device

Care manager monitors daily vitals and follows-up as appropriate

Once the patient is stable they are exited/disenrolled and transitioned to usual care (PCP or continue to be followed by HF Care Manager)

Time in the program is 3-6 months on average



Program Tools – Patient Information

Adobe Acrobat Standard - [promo member slick.pdf]

File Edit View Document Comments Tools Advanced Window Help

Search Create PDF Comment & Markup Send for Review Secure Sign

Select 118% Help

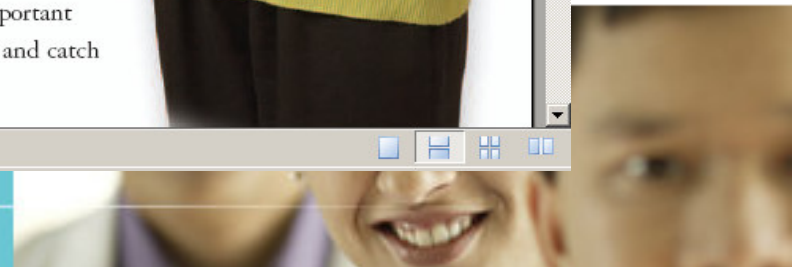
Bookmarks Signatures Pages Attachments Comments

How a Health Status Monitor will help me.

Why is it important to take my vital signs?

Your health status monitor will allow you to take your vital signs everyday of the week. That's important because it allows us to monitor your health and catch small changes before they become serious.

1 of 2



Kaiser-Honeywell HomMed Monitor Request

To be completed by Kaiser Staff

Complete and fax to Honeywell HomMed Customer Service: 1-262-252-5795 &

There's No Place Like Home: 1-818-337-7558

Member Name _____ Member ID # _____

Group # _____ DOB _____ County: _____

Street Address _____ City _____ State _____ Zip _____

Primary phone _____ Alternate phone _____ Preferred contact time _____

Male/Female Ht _____ Wt _____ Primary diagnosis _____ Secondary diagnosis _____

Primary Language _____

Bi-lingual Installer Required? Yes _____ No _____

Monitor Selection

- Genesis (Weight, NIBP, Heart rate, modem transmission only)
- Sentry (Weight, NIBP, Heart rate, SPO2, temperature, modem/pager transmission) (Note: use only after prior approval from Honeywell HomMed in specially authorized situations)

Subjective Questions, peripheral devices / cables

- Program the following questions to be asked daily (up to 10 total including four outcomes questions)
___ # ___ # ___ # ___ # ___ # ___ # ___ # ___ # ___ # ___
- Program the four weekly questions (Thursdays only) #48, #49, #50, #51

Peripheral devices / cables (if only one item is needed, such as a device cable, circle item)

- Genesis Oximeter Assembly Other _____
- LifeScan OneTouch (Basic, Profile, or Ultra)/cable
- Fiko-1 Peak Flow Meter/cradle/cable

Request to Installation Agency:

Priority Level

- Install within 1 business day: Reason for urgency: _____
- Install within 2 business days
- Install within 3-5 business days

Full Screen ▾
Close Full Screen

Stein, Matthew

Memorial Hospital - North Side Clinic

Condition	Patient Name	Weight	Blood Pressure	SpO2	HR	Temp	Answers	Additional Devices
ALERT	Delaney, Russell	245.0	160 / 105 (123)	86	115	-	2 Yes, 8 No	-
ALERT	Huang, Greg	162.0	157 / 90 (112)	87	105	98.1	10 No	-
ALERT	Bruchard, Anna	133.5	151 / 95 (114)	93	110	-	1 Yes, 9 No	-
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NDR	Orr, Terrance	-	-	-	-	-	-	-
NULL	Wilford, James	-	-	-	-	-	-	-
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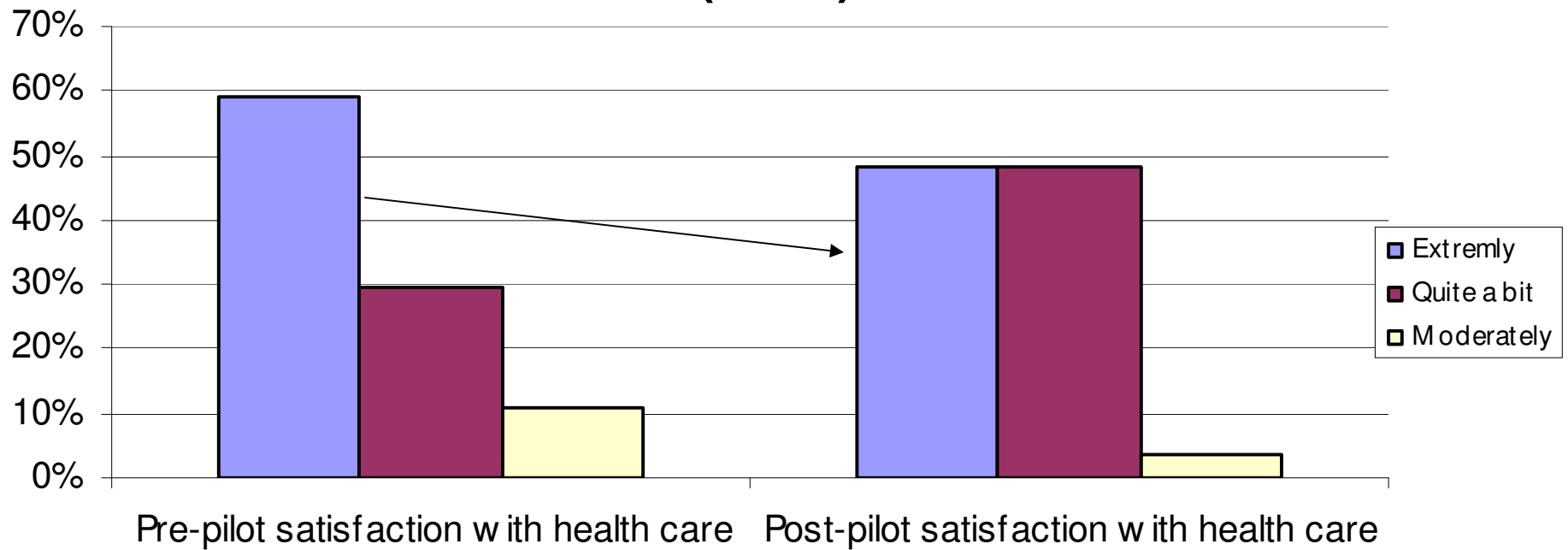
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Alert Limits Respond

- **Care Manager survey:** Qualitative assessment of perceived change in quality of care, productivity, ease-of-use, satisfaction with the technology (at 6 months)
- **Care Manager telephone logs:** Qualitative analysis of Care Manager perceived avoided utilization
- Post study comparison of **utilization** using administrative data (at 9 months)
 - Inpatient, urgent care and ER utilization (inside and outside)
 - CHF readmissions
 - Length of stay
- **Patient satisfaction** with care and device
- Patient **quality of life**, pre-post (MLWHF or SF12)
- HgA1c levels for diabetic patients in Kern with A1c>9: goal is to reduce by 2%



Pre/Post Pilot Member Satisfaction with Health Care (n=27)

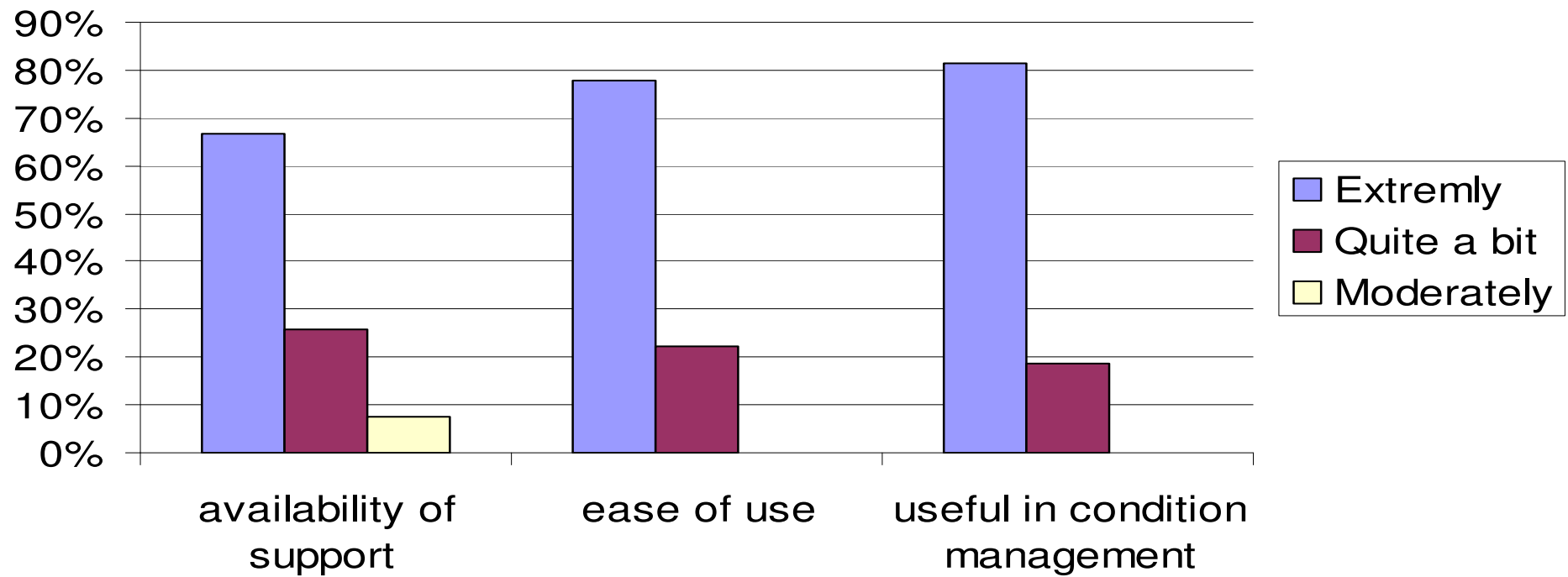


Note: Riverside and Panorama City/Lancaster only. Kern return rate too small to include.

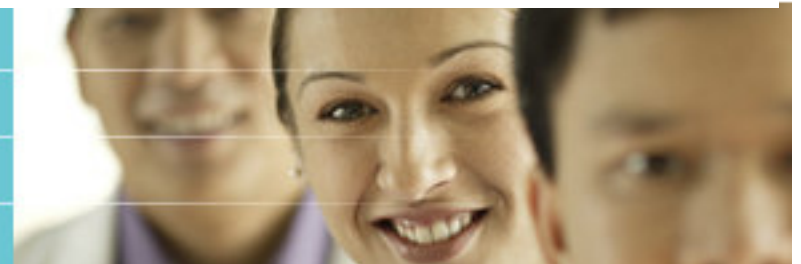


Post Pilot Member Satisfaction Survey Results

(n=27)

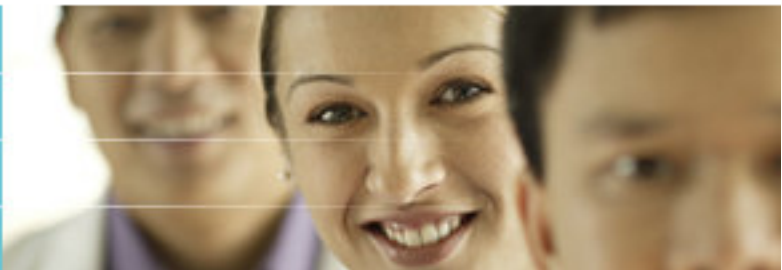
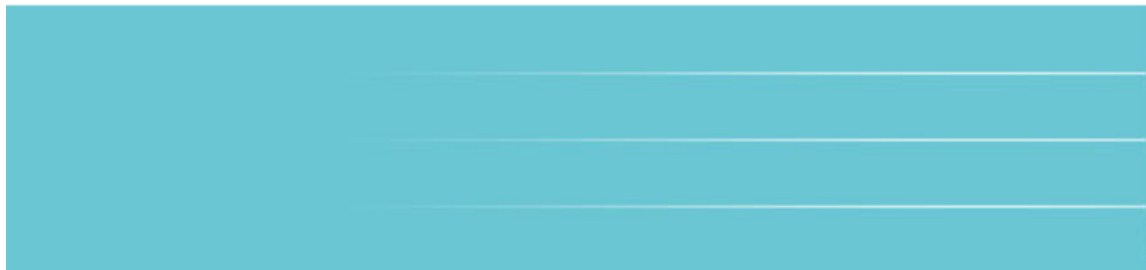
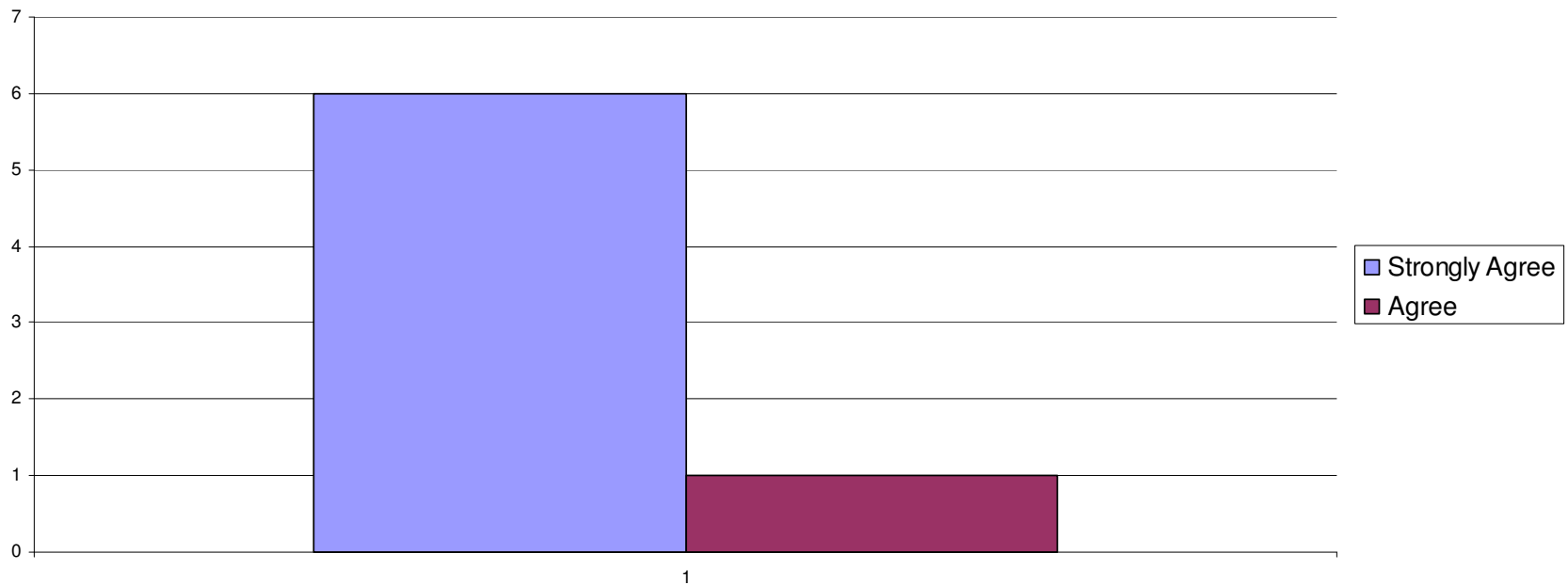


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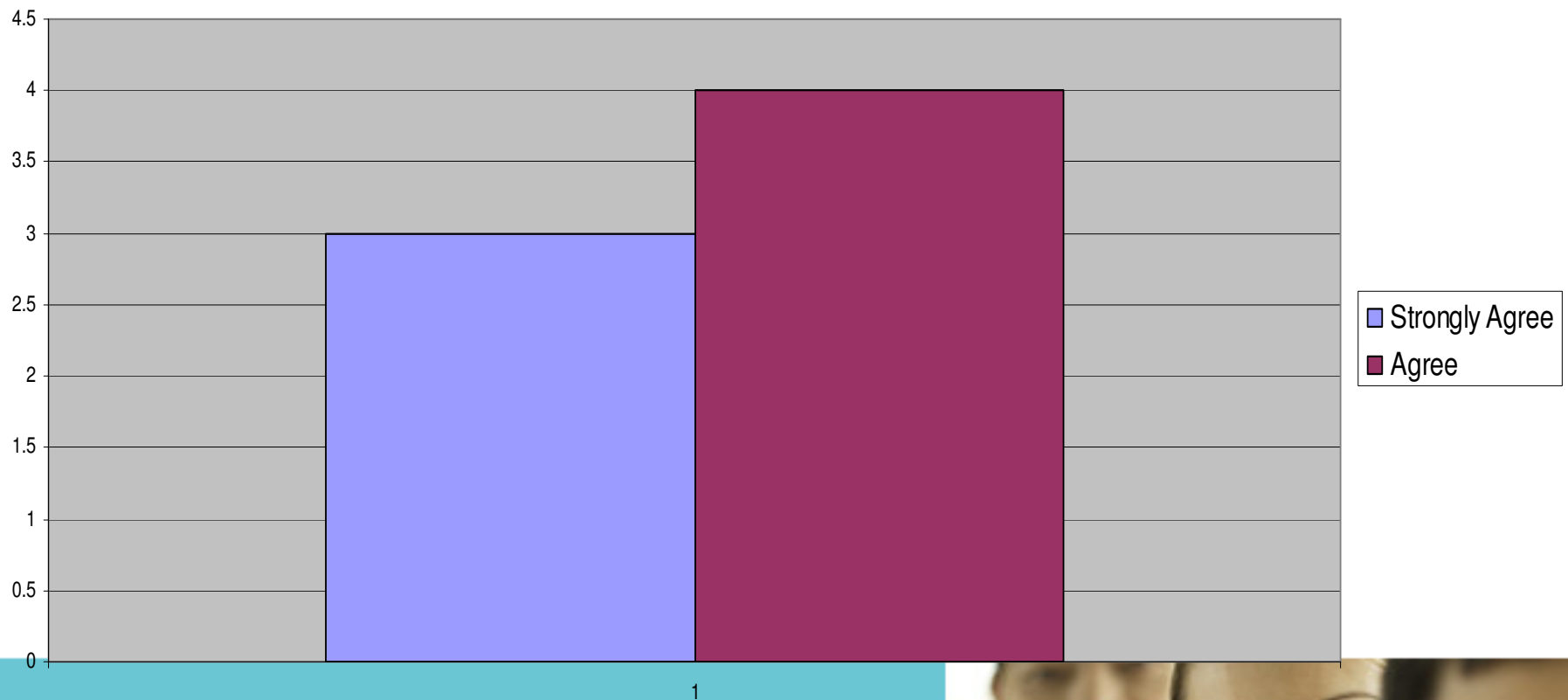
Care Manager Post-Pilot Survey

17. Is the usage of the telemonitoring device a benefit to your patients?

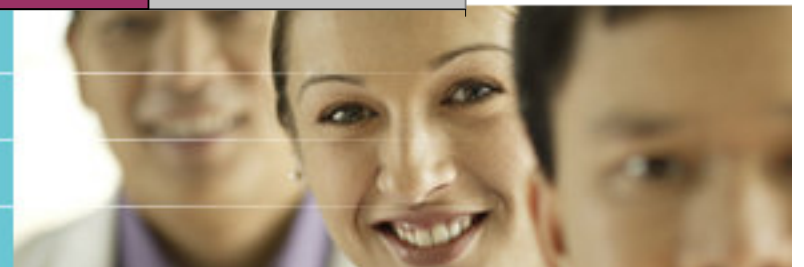


Care Manager Post-Pilot Survey

18. Do you feel you are a more effective care manager using the telemonitoring device?



1



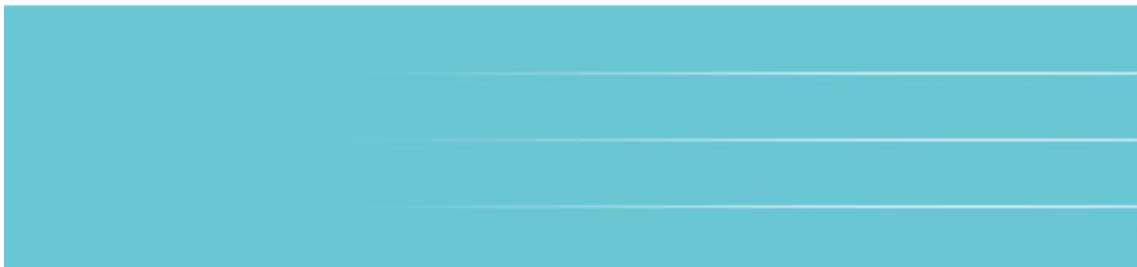
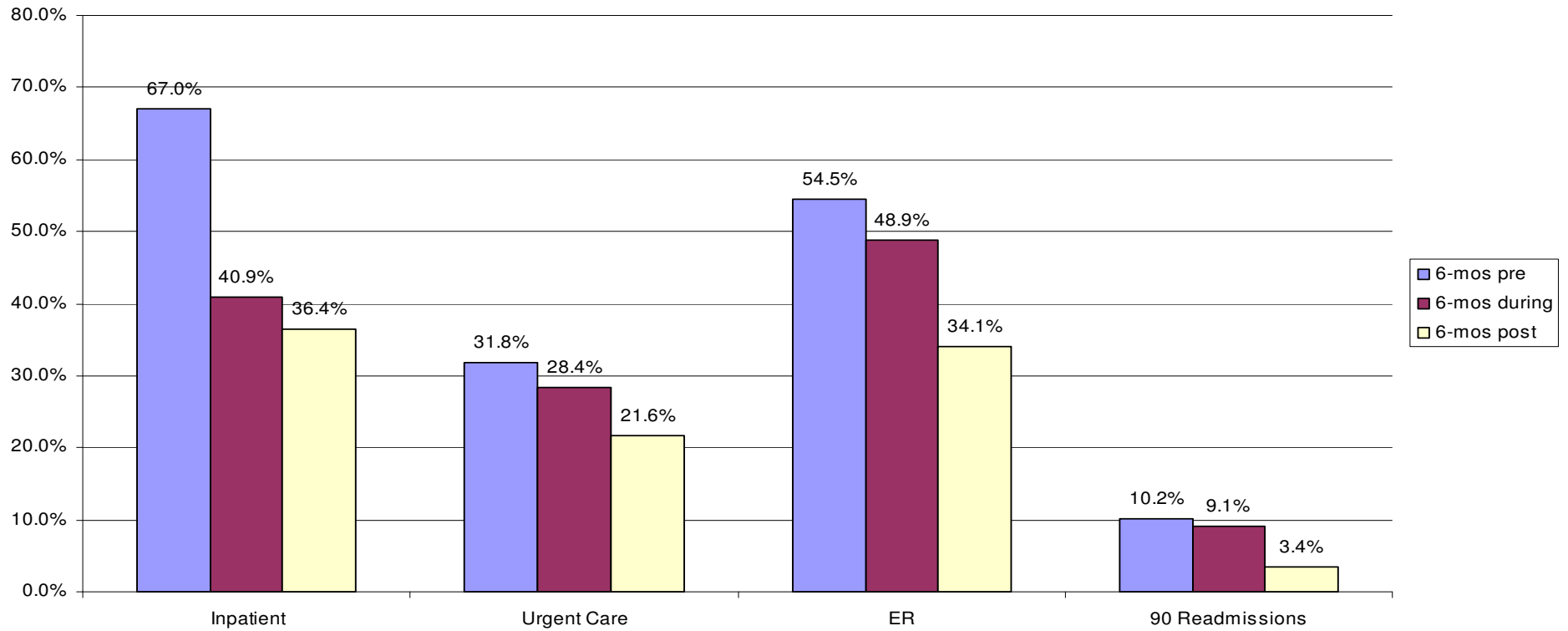
No significant difference between pre/post results for the MLWHF questionnaire SF-12 results for non-HF patients – sample too small to compare



Utilization Analysis

Utilization Analysis-Pre-During-Post

(Preliminary Data, N=88)



- Care Managers logged interventions made as a result of data received which they strongly felt prevented ER visits and admissions
- The availability of the real time data from these high risk patients enables the Care Manager to intervene when necessary.
- Members who acted on their own to adjust diuretics were not included in these logs



Stein, Matthew

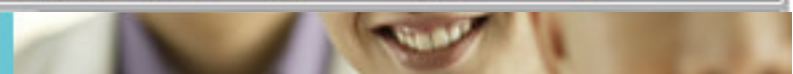
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Alert Limits Respond

Patient List Tabular Trends Demographics Equipment Setup Notes



- Ms. Jones sends her daily vitals. The care manager sees that her diastolic b/p increased to 90 which is unusual for her. She also responded “yes” to more tiredness and swelling than usual.
- The care manager calls the patient and adjusts medications which could include diuretic, htn meds, and/or insulin, and provides education about diet and fluid consumption.



Interventions Preventing Exacerbation

Location	Devices	Months	Interventions
Panorama City	35	6	148+*
Lancaster	15	6	51*
Riverside	48	6	161*
Kern	35	6	pending

*Note: Members who used their own self-adjusted diuretic action plan were not included in these numbers



Initial findings as of 3/26/07

14 patients completed 6 month pilot

**10 out of 14 had reduced A1c levels with
average reduction of 3.5%**



- Care managers access to real time patient vitals allows for prevention of exacerbation and ultimately utilization
- Very high member satisfaction with devices
- Dedicated Care Management staff needed for efficiency and satisfaction (i.e., no less than 25-50 devices per care manager)
- Quality of vendor installation partner impacts care manager satisfaction and efficiency



Prevention of HF exacerbation will help improve patient health, reduce utilization, reduce demand on primary and specialty care and improve access

Remote telemonitoring has been shown by improve patient and care manager satisfaction and reduce utilization

