Safety Net Analytics Program

Learning Session #11 – August 18, 2015

To view the recording of this webinar, please go to this website:

https://vimeo.com/136739078

Safety Net Analytics Program

Patient Segmentation for Care Coordination

Learning Session #11 – August 18, 2015

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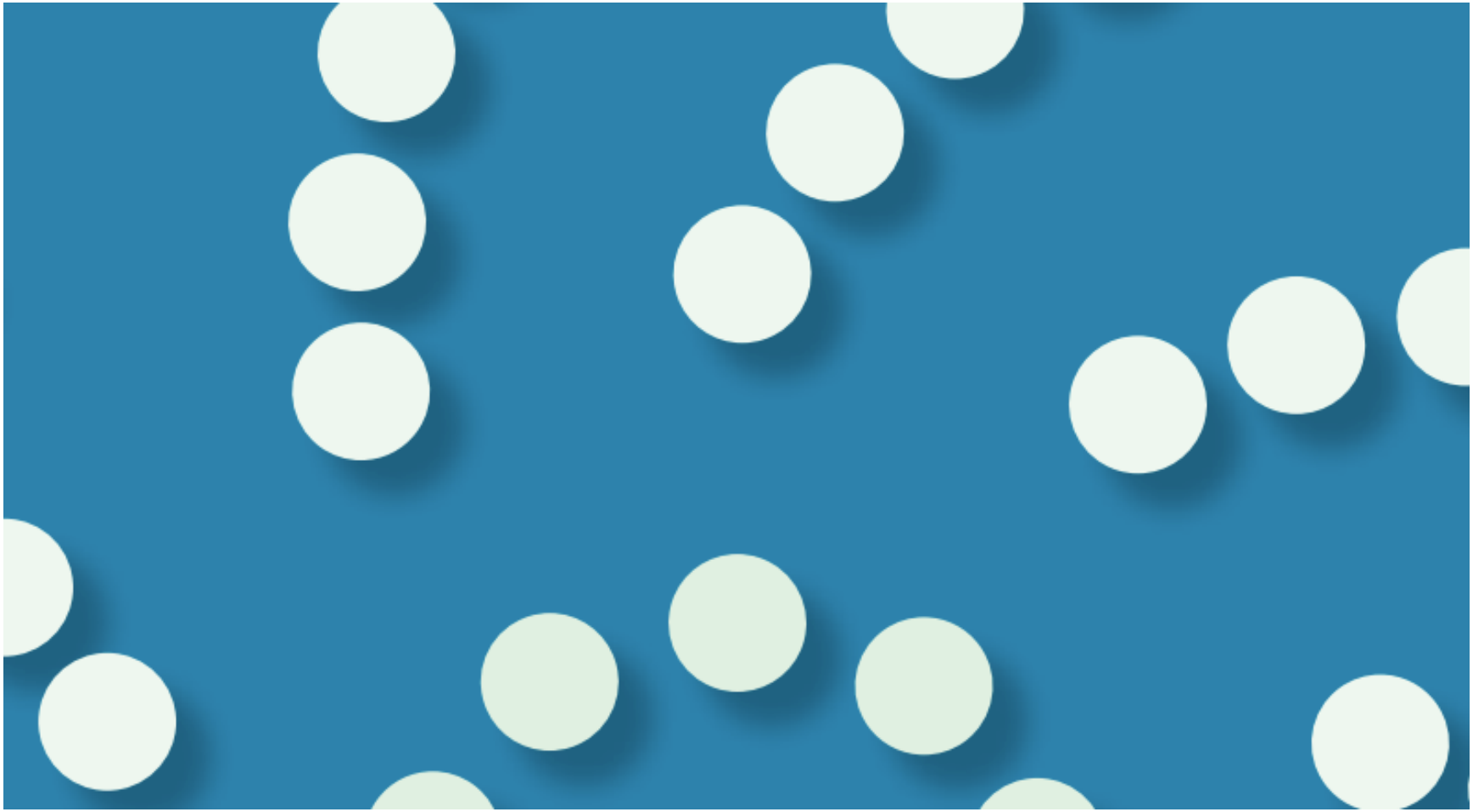

Program Updates

1. Informing Change Interviews
   - Project Charter Updates
2. Empanelment Webinar Series
   - **Part 1: Empanelment Basics – Recording Available Sept 1st**
   - **Part 2: A Deeper Dive into Empanelment**

     September 8th 12:00 – 1:30 p.m.
3. In Person Convening - November 10, 2015
   - San Francisco Bay Area
   - Module 4: Trends, Tools and Technology

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Denver Health's 21st Century Care: Population Health-Informed Primary Care Services

Safety Net Analytics Program
8-18-15

Tracy Johnson, PhD, MA, co-PI, Evaluation Lead
Holly Batal, MD, MBA, co-PI, Clinical Lead

Acknowledgements and Disclaimers

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- Core Team, Clinical Teams, IT Team, Evaluation Team, ACS and Executive Leadership (past and present)
- Denver Health's 21st Century Care project is supported by the Department of Health and Human Services, Centers for Medicare & Medicaid Services, Contract Number 1C1CMS331064.
- The contents of this publication are solely the responsibility of the authors and do not necessarily represent the official views of the U.S. Department of Health and Human Services or any of its agencies.

- The analysis presented was conducted by the awardee. Findings may or may not be consistent with or confirmed by the independent evaluation contractor.
- The Colorado Multiple Institutional Review Board determined this project to be Quality Assurance, Not Human Subject Research.

Denver Health – 21st Century Care

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Improve access and achieve Triple Aim: better care, smarter spending, healthier people

Enhanced clinical services through redesigned health teams (~$9m)

- Clinical pharmacists
- Behavioral health consultants
- RN care coordinators
- Patient navigators
- Social workers
- Specialized high intensity teams

•Enhanced health information technology (~$9m)

- Population segmentation/patient risk stratification
- 3M™ Clinical Risk Groups (CRGs)
- eTouch Services

•Administration and Evaluation (~2m)

- Rapid Cycle Evaluation NOT Research

CMMI Award
2012
3 years
$19.8 million

Data Notes: Adapted from Rachel M. Everhart, EVALUATION OF A MEDICAL HOME TRANSITIONS OF CARE INTERVENTION IN A SAFETY NET SETTING, Health Services Research PhD Program Thesis Defense. April 24, 2014

Presentation Outline

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21st Century Care: a population health approach to primary care

- Population Segmentation/Risk Stratification:
  - Who
  - How
  - Why

What is Population Health?
Which is the Population of Focus?

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- Population Health is "the practice of determining the health and health needs of a population by measuring and reporting [clinical and non-clinical] factors that may influence an individual's health." Looks for patterns in data to be used to improve health outcomes (U.S. Department of Veterans Affairs)

- DH Public Health = Denver County/region
- DH Managed Care = Health Plan Members
- DH Primary Care Providers = Panel
- DH "Accountable Care Organization" (ACO) Model
  - Primary care patients
  - Managed care patients
  - Frequent users of IP, ED, Urgent Care services

21st Century Care: Population Health "Tiered" Delivery of Enhanced Care Management Services

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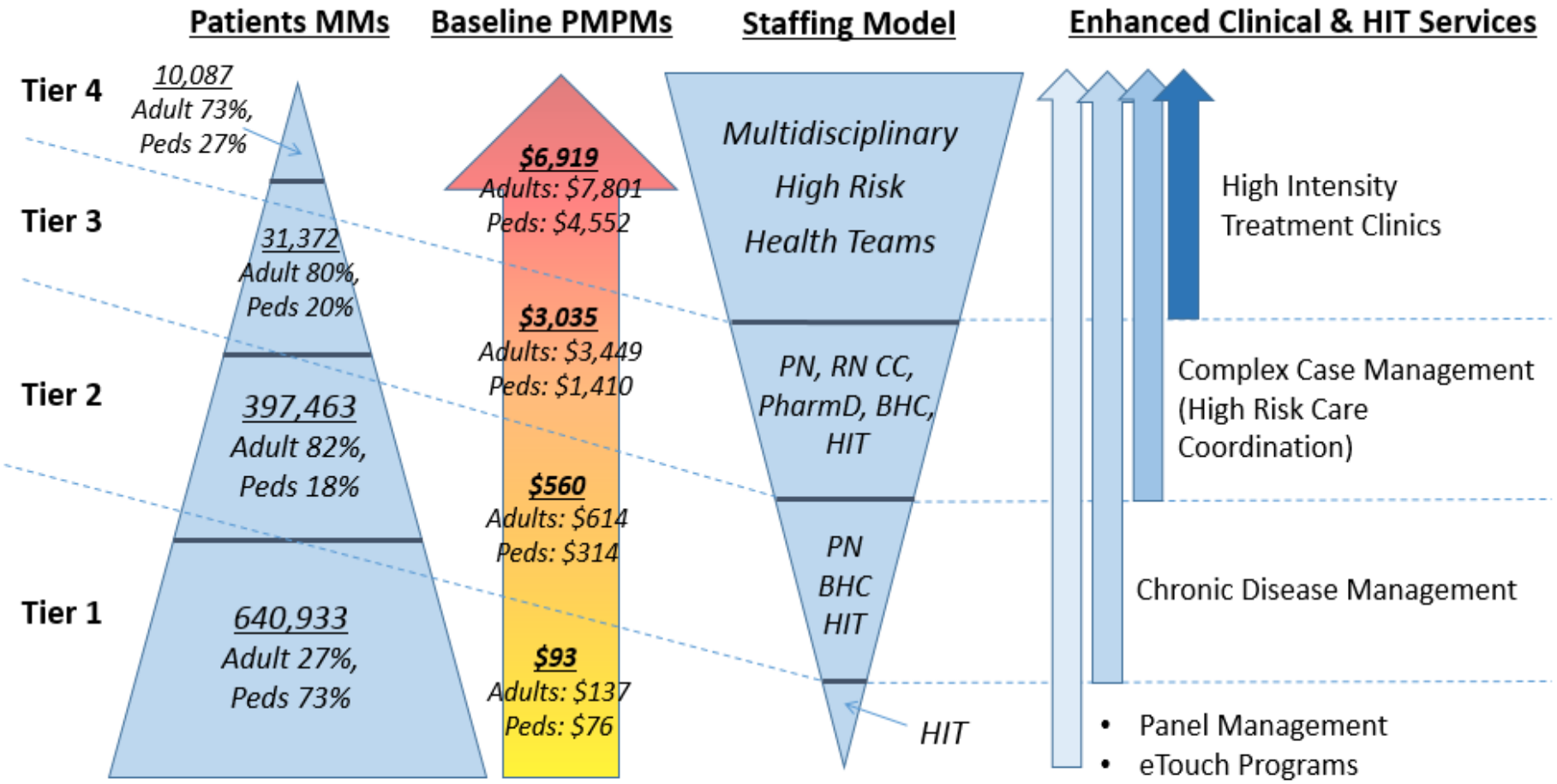

Notes: Baseline period is July 2010 through June 2011. This initial "proof of concept" tiering algorithm was implemented by Milliman using CDPS predictive modeling tool thresholds to define tiers. Tier sizes were pre-determined according to estimated resource capacity. The attributed managed care population was identified through membership files, whereas the fee-for-service population was selected at a single point in time at the beginning of the time period and fixed for the duration. All attributed individuals were tiered. MM: Member months, PMPMs: Per member per month, PN: Patient Navigator, RN CC: Nurse Care Coordinators, PharmD: Clinical Pharmacist, BHC: Behavioral Health Consultant, Health Information Technology: HIT, eTouch: Health Text Messages Programs.

Citation: Johnson T, Estacio R, Vlasimsky T et al., "Augmenting Predictive Modeling Tools with Clinical Insights for Care Coordination Program Design and Implementation," eGEMS August 2015. Vol 3:1(14). Graphic developed by. Susan Moore, Kathy Thompson and Sarah Sabalot.

Who Do We Tier?

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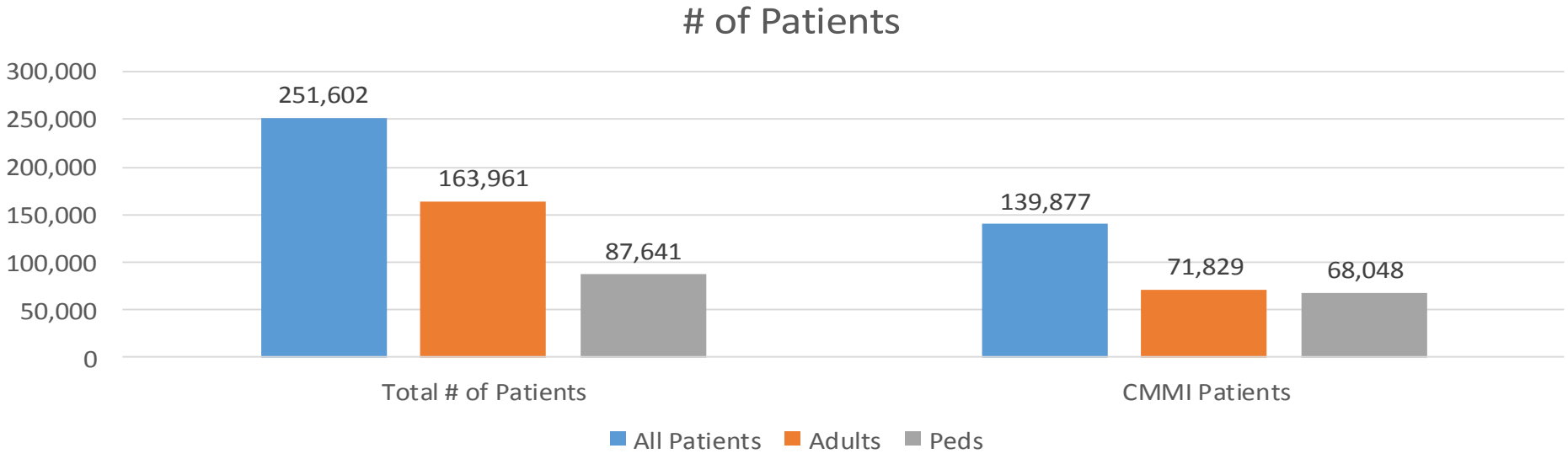
- All patients who have had a visit to a Denver Health facility in the previous 18 months (includes clinic visits, hospital, ED, urgent care, public health visits, etc.)
- Medicaid, Medicare, CHP Managed Care patients, regardless of whether they have been to DH or not
- Run daily, with full population refreshes monthly



How Do We Tier?

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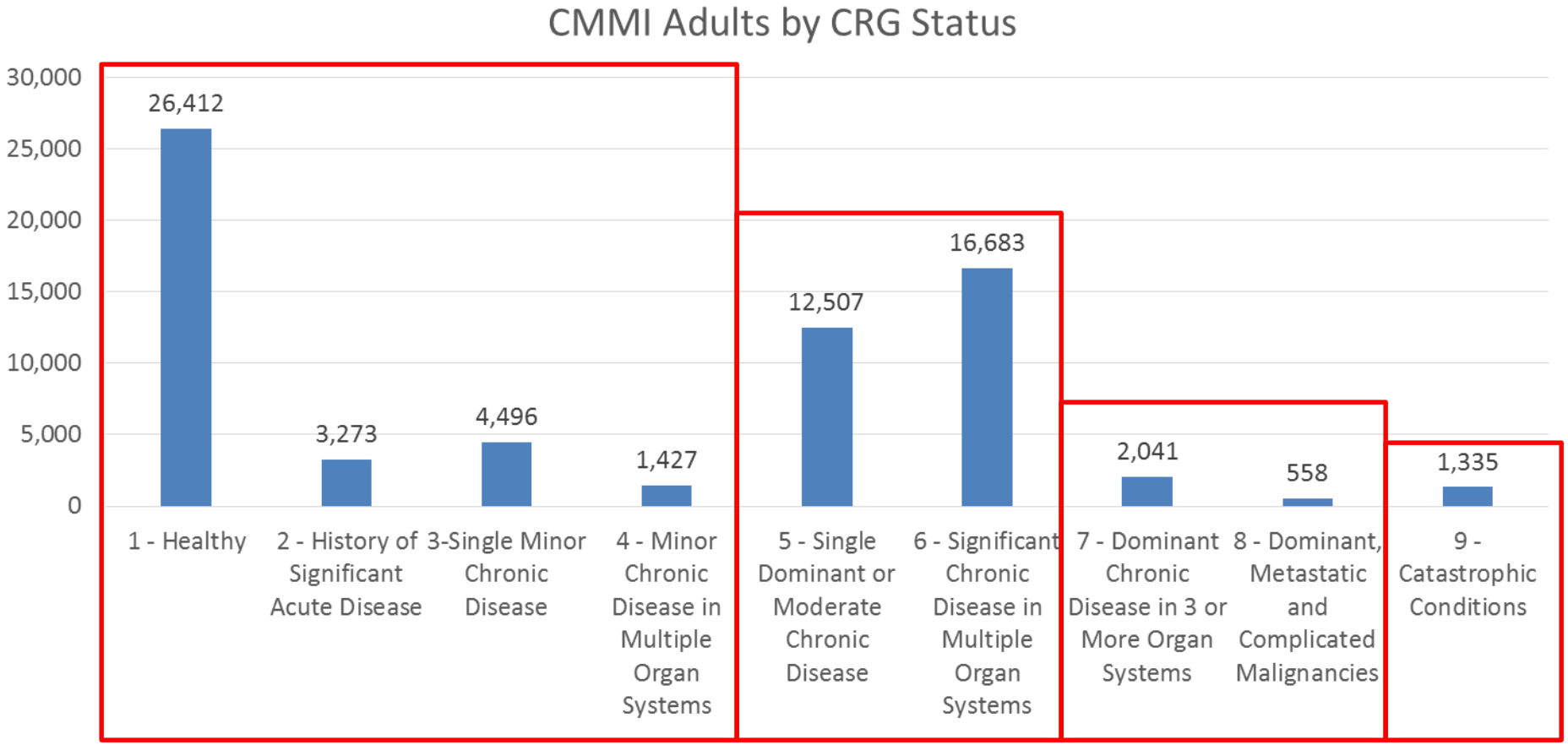
- Clinical Risk Groups (CRG) is a commercial diagnosis grouper and we considered tiering based on CRG alone



How Do We Tier?

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- Decided CRG Status alone does not suffice for initial tier sorting
- Needed to include the notion of "actionable patients"
- Drilled down to individual CRG's which were more clinically meaningful for matching clinical resources to patient need
- CRG Levels are predictive of future patient health and costs

Base CRG Description	# of Pts.
6100 – Chronic Renal Failure and Other Dominant or Moderate Chronic Disease	5
6111 – Congestive Heart Failure and Diabetes	14
6130 – Cerebrovascular Disease and Diabetes	9
6142 – Diabetes and Asthma	43
6150 – Advanced Coronary Artery Disease and Other Dominant Chronic Disease	14

Full CRG Description	Avg. Charges
61421 – Diabetes and Asthma – Level 1	$5,815
61426 – Diabetes and Asthma – Level 6	$41,346

Optimizing Tiering

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Example of Drill-Down Analyses to Inform Tiering Rule Development

Tier	# of Patients	Avg Chrgs	Avg IP Stays	Avg Chrgs	Avg IP Stays	Avg Chrgs	Avg IP Stays
		8/10 – 8/11		8/11 – 8/12		8/12 – 8/13	
		Year before Tiering Date		Year after Tiering Date		2 Years after Tiering Date	
1	38	$859	0.00	$5,987	0.18	$6,479	0.13
2	1,367	$6,853	0.07	$12,274	0.16	$13,208	0.12
3	197	$30,800	0.61	$39,678	0.62	$34,587	0.56
4							
Tot							

Tier	CRG Status	# of Patients	Avg Chrgs	Avg IP Stays	Avg Chrgs	Avg IP Stays	Avg Chrgs	Avg IP Stays
			8/10 – 8/11		8/11 – 8/12		8/12 – 8/13	
			Year before Tiering Date		Year after Tiering Date		2 Years after Tiering Date	
1		38	$859	0.00	$5,987	0.18	$6,479	0.13
2	1 - Healthy	1	$1,643	0.00	$9,520	0.00	$32,090	1.00
	3 - Single Minor Chronic Disease	1	$3,295	0.00	$0	0.00	$4,847	0.00
	4 - Minor Chronic Disease in Multiple Organ Systems	1	$4,550	0.00	$0	0.00	$710	0.00
	5 - Single Dominant or Moderate Chronic Disease	430	$3,845	0.04	$6,622	0.08	$10,889	0.10
	6 - Significant Chronic Disease in Multiple Organ Systems	915	$7,820	0.08	$14,682	0.20	$14,183	0.13
	8 - Dominant, Metastatic and Complicated Malignancies	11	$31,568	0.36	$11,46	0.18	$5,165	0.00

Tier	CRG Status	Base CRG	Avg Chrgs	Avg IP Stays	Avg Chrgs	Avg IP Stays	Avg Crgs	Avg IP Stays
			8/10 – 8/11		8/11 – 8/12		8/12 – 8/13	
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	4 - Minor Chronic Disease in Multiple Organ Systems		$4,550	0.00	$0	0.00	$710	0.00
	5 - Single Dominant or Moderate Chronic Disease		$3,845	0.04	$6,622	0.08	$10,889	0.10
	6 - Significant Chronic Disease in Multiple Organ Systems	6141 - Diabetes and Other Dominant Chronic Disease	$62,105	1.00	$84,393	3.00	$803	0.00
		6143 - Diabetes and Other Moderate Chronic Disease	$11,542	0.16	$22,256	0.37	$12,136	0.15
		6142 - Diabetes and Asthma	$8,822	0.08	$11,039	0.12	$23,045	0.20
		6145 - Diabetes and Other Chronic Disease Level 2	$6,242	0.11	$11,359	0.16	$10,877	0.11
		6144 - Diabetes and Hypertension	$5,919	0.03	$10,612	0.12	$13,938	0.12
		6270 - Two Other Moderate Chronic Diseases	$1,066	0.00	$3,940	0.00	$2,420	0.00
	8 - Dominant, Metastatic and Complicated Malignancies		$31,568	0.36	$11,467	0.18	$5,165	0.00
	9 - Catastrophic Conditions		$25,302	0.50	$45,214	0.38	$37,637	0.38
3			$30,800	0.61	$39,678	0.62	$34,587	0.56
4			$67,959	1.70	$52,404	1.07	$81,615	0.89
Total			**$18,038**	**0.36**	**$20,802**	**0.34**	**$25,157**	**0.28**

Citation: Johnson T, Estacio R, Vlasimsky T et al., "Augmenting Predictive Modeling Tools with Clinical Insights for Care Coordination Program Design and Implementation," eGEMS (Generating Evidence & Methods to improve patient outcomes). 2015 (In press.)

Pediatric Patients by CRG

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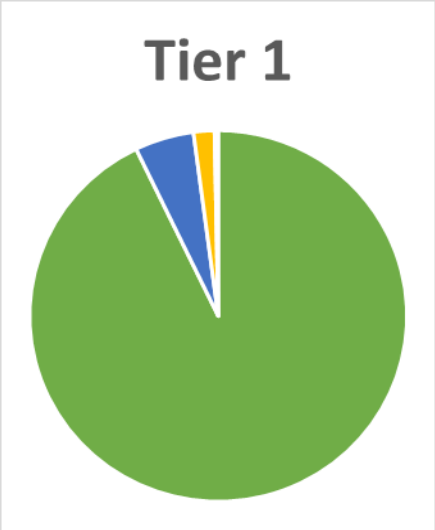
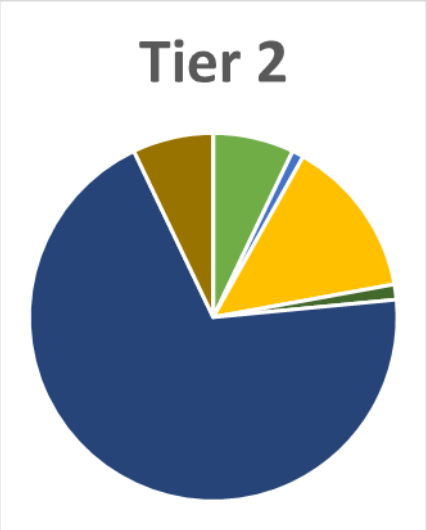
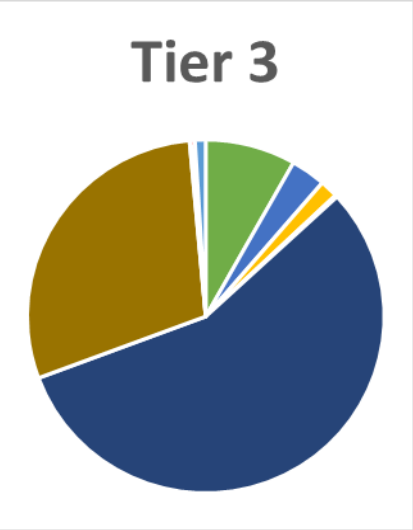
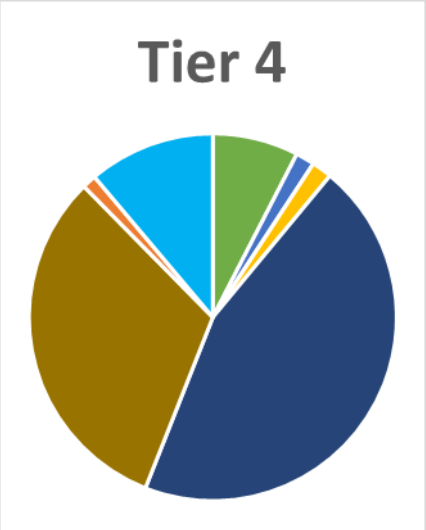
CRG Description	1	2	3	4	Total
1-Healthy	58,401	597	135	55	59,188
2-history of Significant Acute Disease	3,184	86	52	12	3,334
3-Single Minor Chronic Disease	1,136	1,179	27	13	2,355
4-Minor Chronic Disease in Multiple Organ Systems		112	3		115
5-Single Dominant or Moderate Chronic Disease	192	5,839	927	327	7,285
6-Significant Chronic Disease in Multiple Organ Systems		596	482	230	1,308
7-Dominant Chronic Disease in 3 or More Organ Systems			2	9	11
8-Dominant, Metastatic and Complicated Malignancies		1	6		7
9-Catastrophic Conditions			16	81	97
Total	**62,913**	**8,410**	**1,650**	**727**	**73,700**









How Do We Tier?: Using Predictive Modeling and Clinical Insight (Adults)

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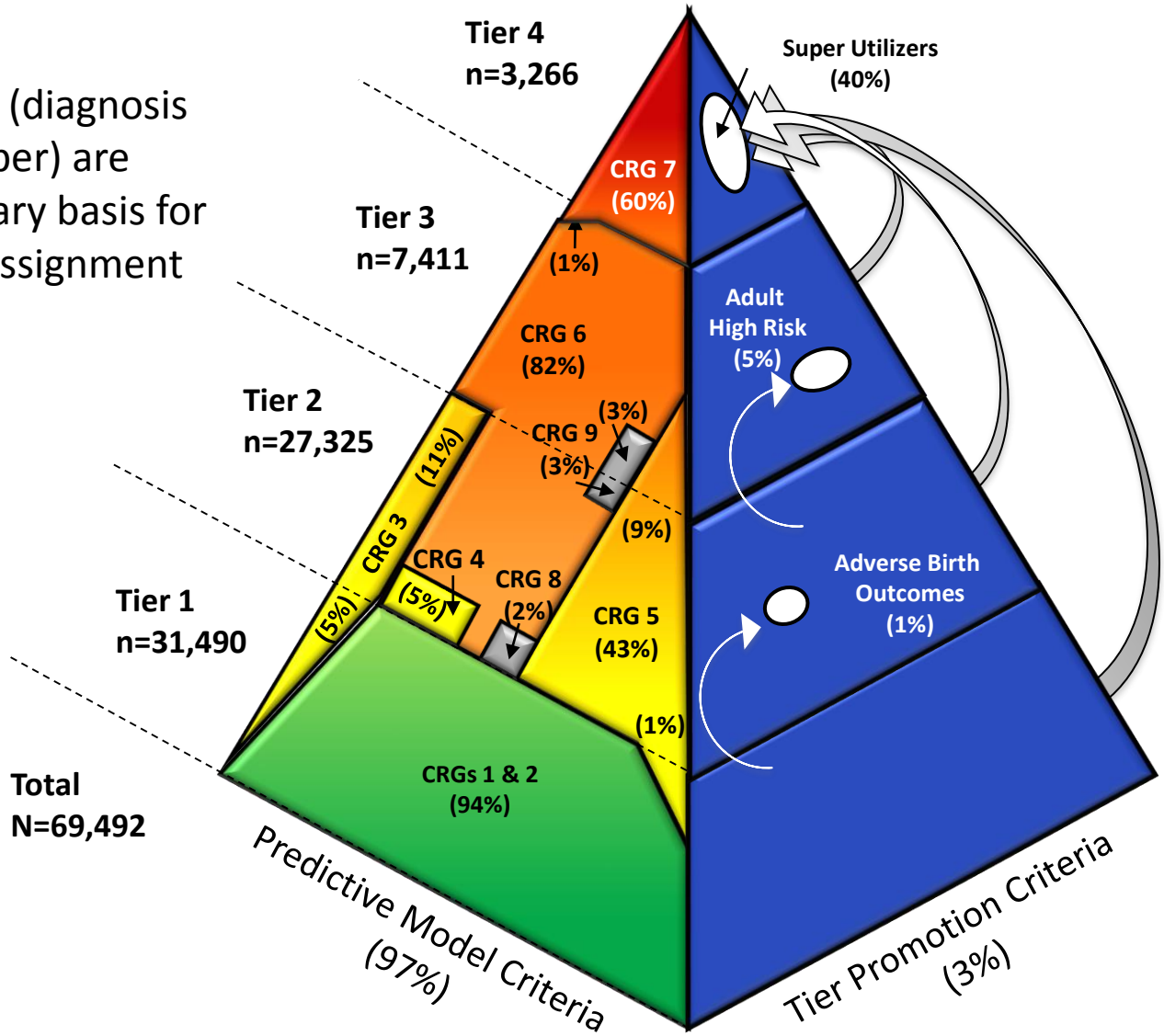
CRGs (diagnosis grouper) are primary basis for tier assignment



Utilization overrides CRG-assigned tier

Citation: Johnson T, Estacio R, Vlasimsky T et al., "Augmenting Predictive Modeling Tools with Clinical Insights for Care Coordination Program Design and Implementation," eGEMS August 2015. Vol 3:1(14).

Population-Level Analysis: by Patient, by Service, by Provider, by Clinic, by Geography

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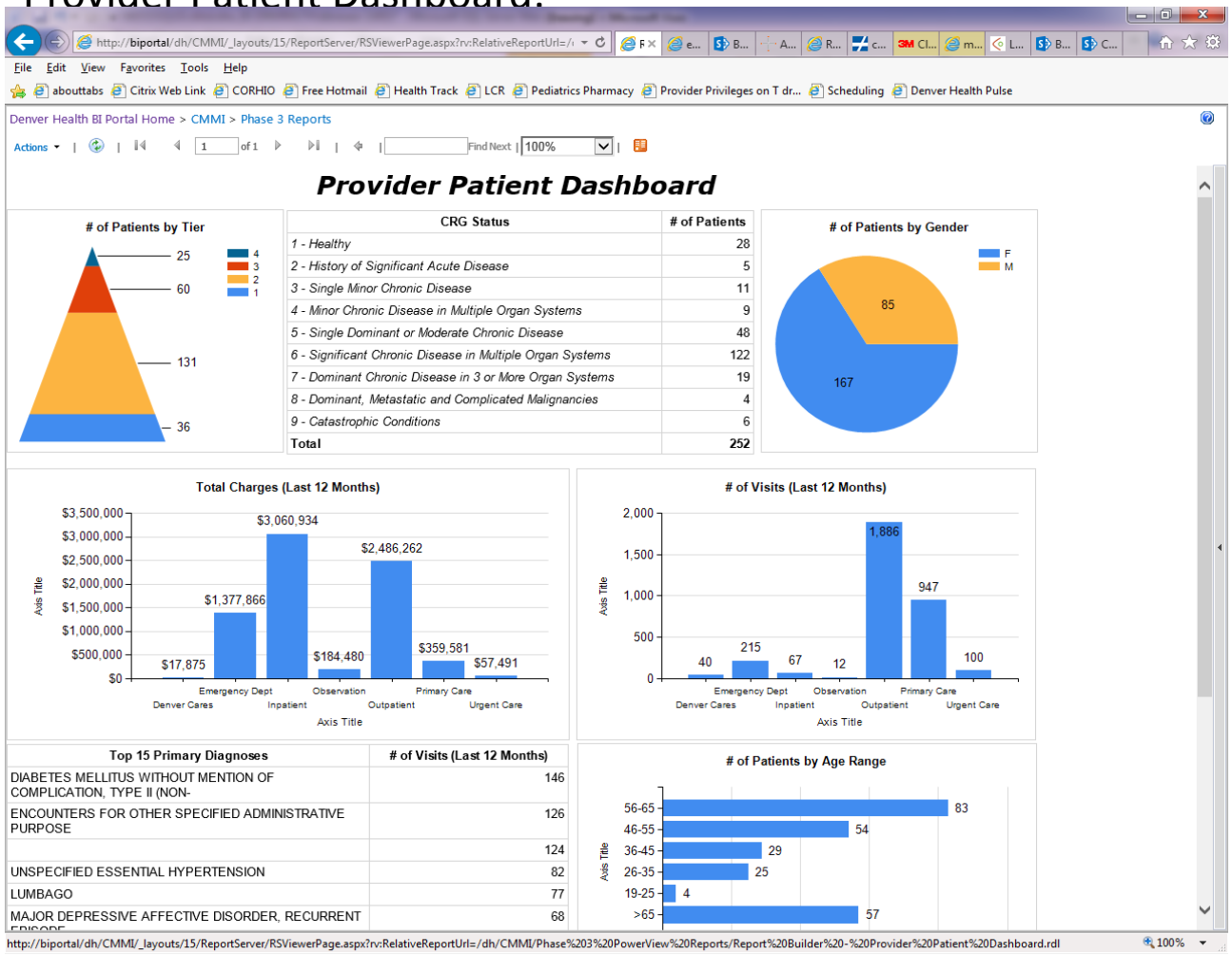
Provider Patient Dashboard:



Super-Utilizer Population Stability Over Time

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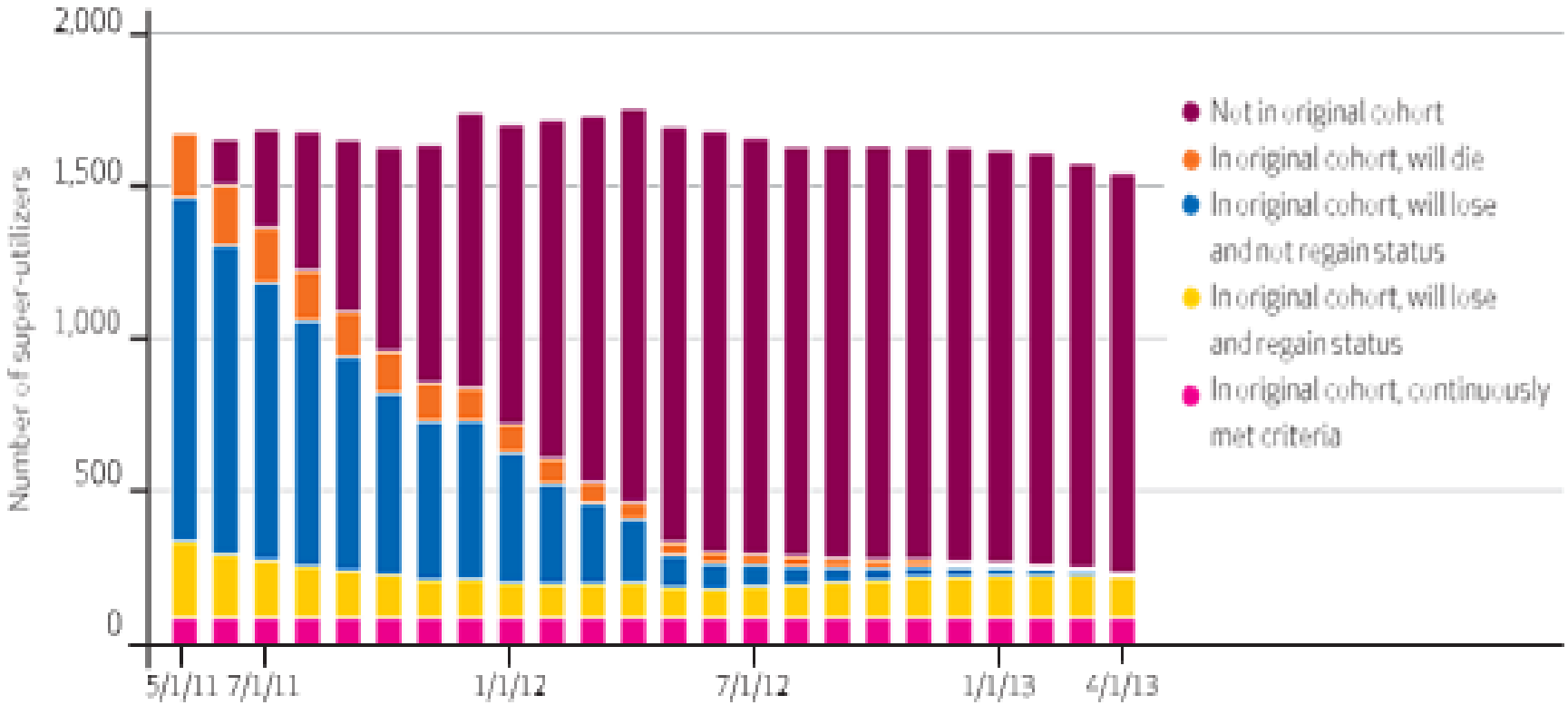
Population And Individual-Level Analyses of Adult Super-Utilizers in Denver County, Colorado, May 1, 2011–April 30, 2013



DATA NOTES: Authors' analysis of data from the data warehouse of Denver Health. NOTES "Not in original cohort" is people who became super-utilizers after the study period began (members of all other categories were in the original cohort). "Will die" is people from the original cohort who died during the study period; some people who died also permanently or temporarily lost super-utilizer status. "Will lose and not regain status" is people from the original cohort who stopped being super-utilizers and did not regain that status during the study period. "Will lose and regain status" is people from the original cohort who stopped being super-utilizers and did regain that status during the study period. "Continuously met criteria" is people who met the criteria for super-utilizers throughout the study period. Some people classified as "not in original cohort" also died, permanently or temporarily lost super-utilizer status, or both during the study period. However, these super-utilizer status changes were not tracked. Only status changes affecting the original cohort are shown in the exhibit.

Tracy L. Johnson, Deborah J. Rinehart, Josh Durfee, Daniel Brewer, Holly Batal, Joshua Blum, Carlos I. Oronce, Paul Melinkovich, and Patricia Gabow. For Many Patients Who Use Large Amounts Of Health Care Services, The Need Is Intense Yet Temporary. Health Affairs. August 2015; 34(8):1312-1319; doi:10.1377/hlthaff.2014.1186

Cost Savings Analysis: Why can't we simply compare utilization/costs of before and after program enrollment?

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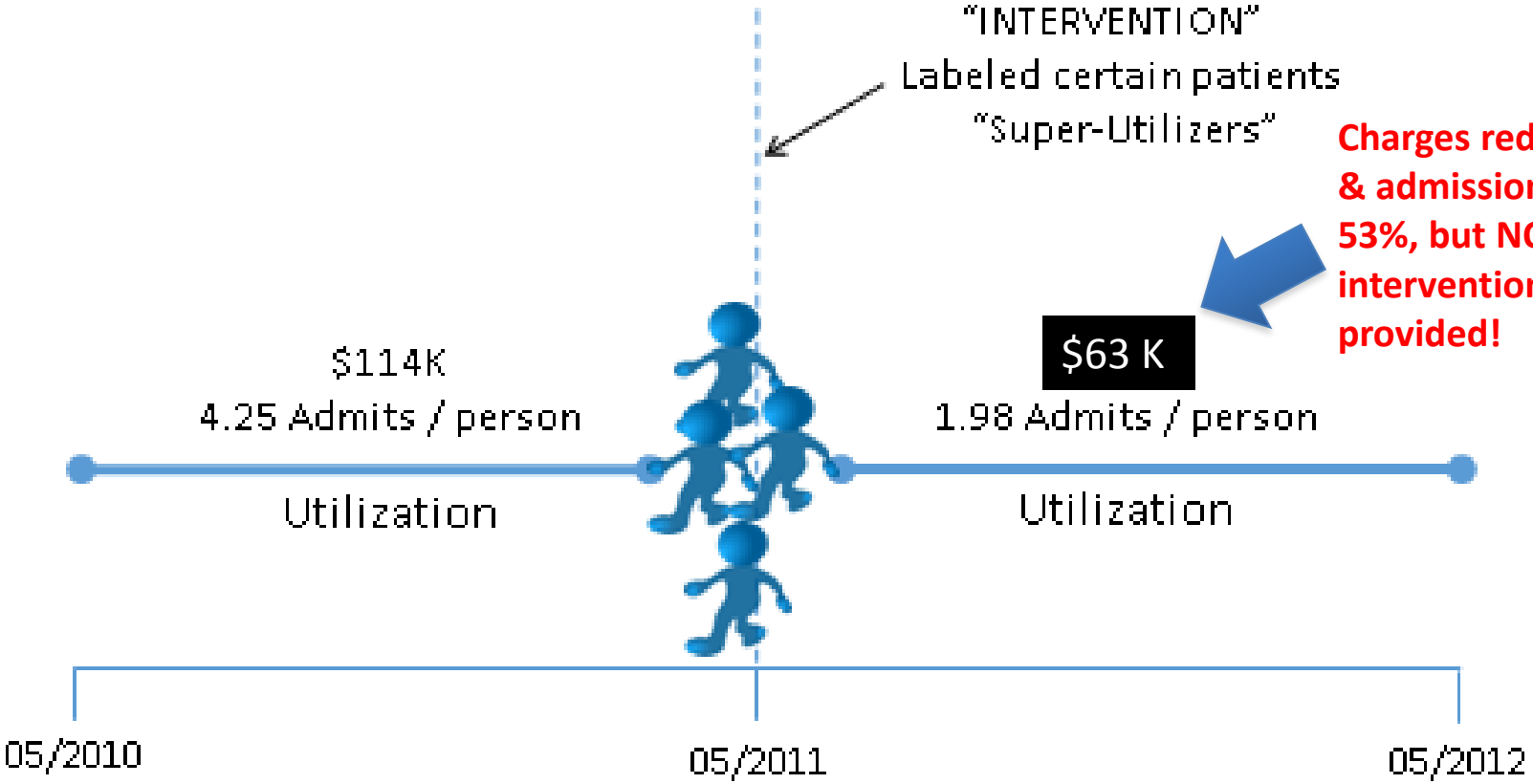

This natural tendency for high-utilizing patients to become less high-utilizing over time is known as "regression to the mean".

Next Steps in Algorithm Development

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- Integrate into new EHR (Epic)
- Collect and integrate data to better capture social determinants of health
- Collaborate with clinics to improve relevance and gain traction

Why do we tier?

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- Identify populations where it is possible to:
  - Reduce inpatient utilization
  - Reduce frequent ED use
  - Increase primary care visits
  - Improve patient health through care management
- Match groups of patients to resources
- To identify patients appropriate for specific interventions, tiering is necessary but not sufficient – also need a triggering mechanism

How are tiers used clinically?

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- Triggering a patient for screening for IOC
- Appear on face sheet – provider and team knowledge
- Appear on worklists – prioritize outreach
- Allocating resources – behavioral health consultants and clinical pharmacists
- Provider referral for high intensity treatment teams
- Adjusting panels
- Interpreting total cost of care

Case example: tiering and triggering for adult high intensity clinical services

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- Tiering – defines total population of patients potentially eligible at any given point of time (population segmentation)
- Triggering – determines the exact patient to focus on at the time that the intervention can be applied
- Will use example of aICU

Intensive Outpatient Clinic (aICU)

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- Targeted to adults with multiple, potentially avoidable, inpatient admissions within a year
- Serves as the patient's medical home and has a much smaller panel size
- More robust staffing model – dedicated social worker and navigator, more generous provider, RN, HCP and clerical ratios per patient
- A range of care coordination/care transition services are provided according to a care plan that captures the following domains: Medical, Psychiatric, Medications, Substance Use/Abuse, Social
- Also have contract with MHCD for a HIT mental health team

aICU (IOC) Target Population is a subset of Tier 4

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Qualification for Tier 4 can occur through four means:

1. Assigned according to Tier 4 Base clinical risk group (CRG)
2. Assigned according to 3+ Inpatient Admits in last 12 months
3. Assigned according to 2+ Inpatient Admits in last 12 months and Mental Health criteria
4. 10+ ED visits in last 12 months

Who are Super-Utilizers?

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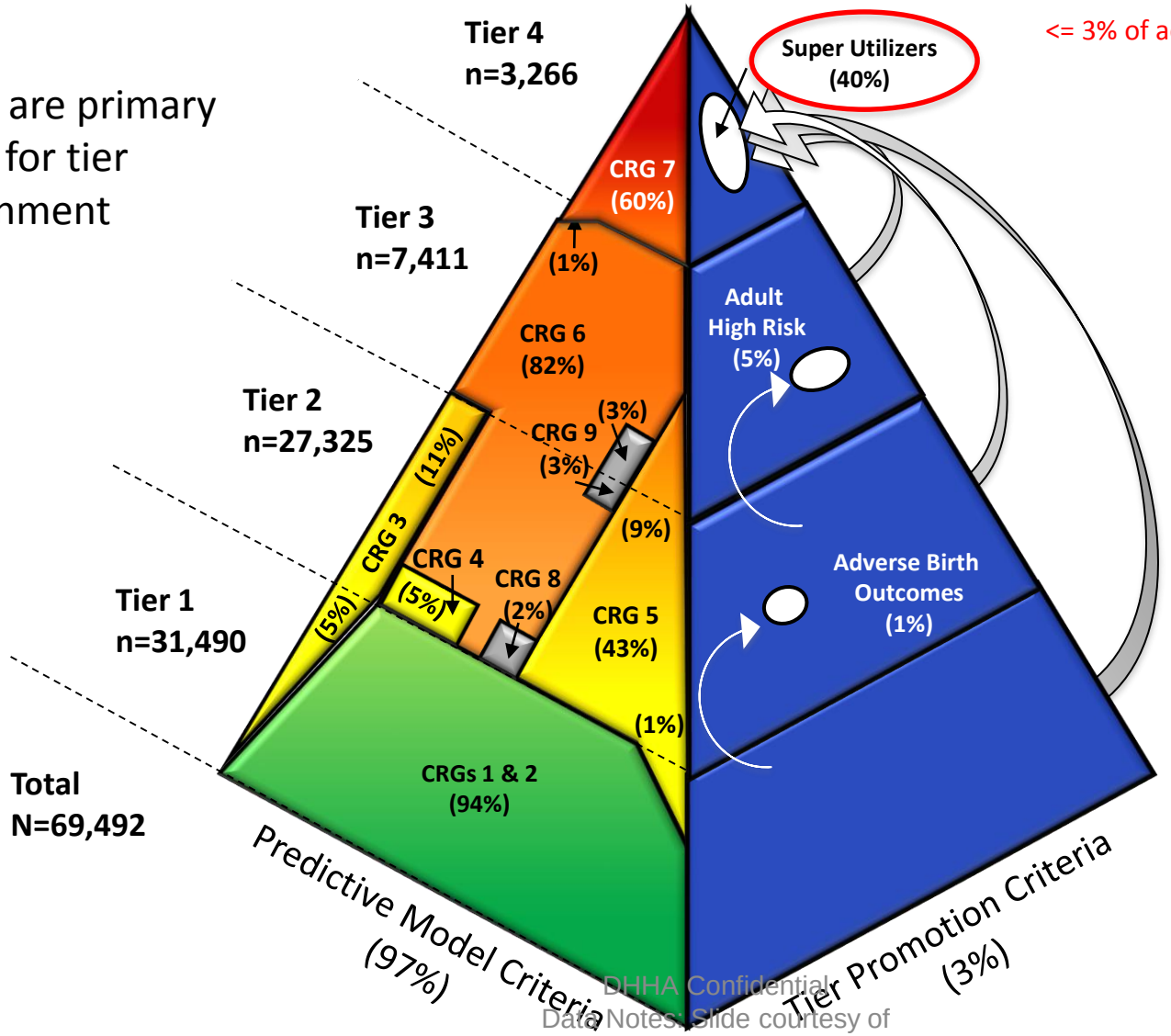
CRGs are primary basis for tier assignment



<= 3% of adults; 30% of facility costs

Utilization overrides CRG-assigned tier

Citation: Johnson T, Estacio R, Vlasimsky T et al., "Augmenting Predictive Modeling Tools with Clinical Insights for Care Coordination Program Design and Implementation," eGEMS August 2015. Vol 3:1(14).

DHHA Confidential
Data Notes: Slide courtesy of

Super-Utilizer Interventions: Adult High IntensityTeams

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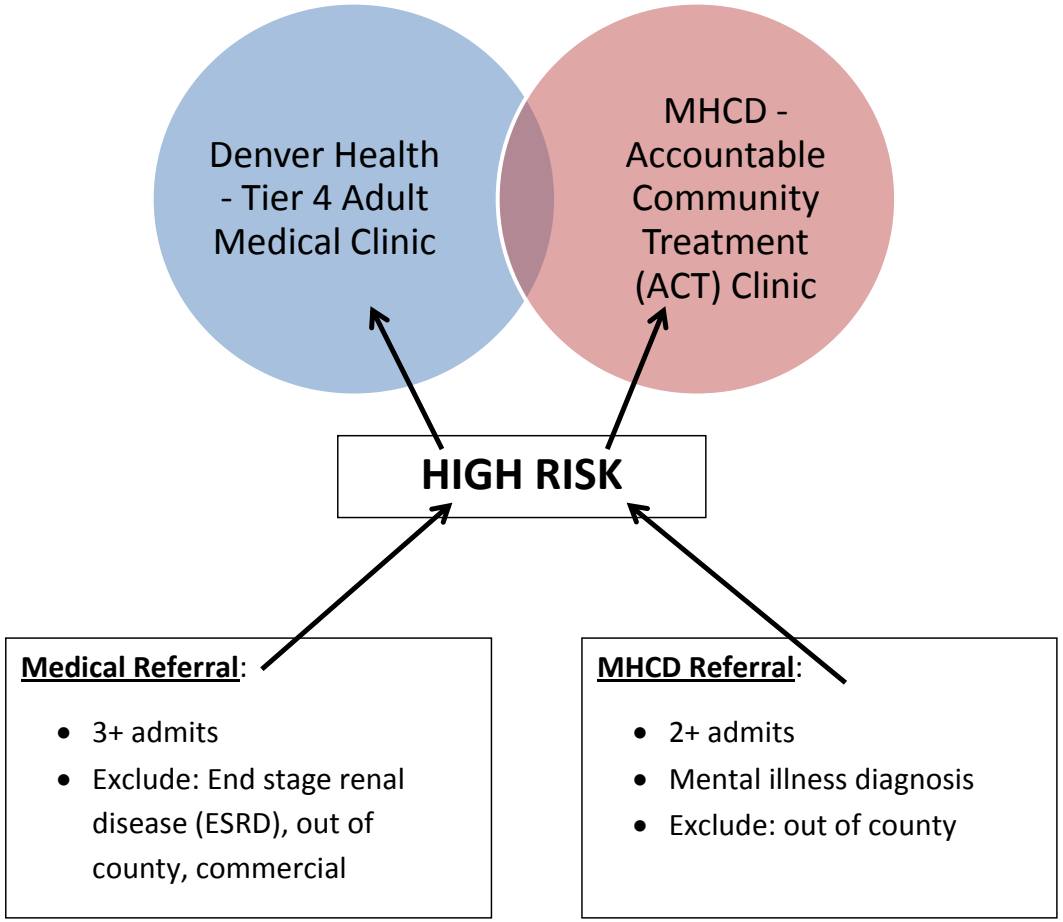
CMMI: MHCD ACT Clinic & Denver Health Tier 4 Adult High Risk Clinic



aICU Patient Recruitment

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- Need real time patient identification
- Trigger event - when a patient was hospitalized and had index, or subsequent, qualifying admission
- Daily list pushed to IOC on patient admission
- IOC screens for eligbility
- For eligible patients follows patient until discharge to attempt to engage them in care
- More recent iteration - MD rounding in hospital

Microsoft Dynamics CRM

Peter B
DenverH

File | Intervention Screenings | View | Charts | Add

New | Edit | Activate | Deactivate — Records

Connect | Assign | Copy a Link | E-mail a Link — Collaborate

Run Workflow | Start Dialog — Process

Run Report | Import Data | Export to Excel | Filter | Advanced Find — Data

Workplace

- My Work
  - Dashboards
  - Activities
  - Calendar
  - Imports
  - Duplicate Detection
  - Queues
  - Articles
  - Reports
  - Announcements
  - Screenings
  - Enrollments
- Extensions
  - Events
  - High Risk Screenings

Intervention Screenings — Screenings Pending Enrollment

Name	Contact	Created On	Date Screened	Enrollment Meth...	Ready for Enroll...	Screenin
Intervention Screening: Tier 4	[redacted]	[redacted]				IOC
Intervention Screening: Tier 4						IOC
Intervention Screening: Tier 4						IOC
Intervention Screening: Tier 4						IOC
Intervention Screening: Tier 4						IOC
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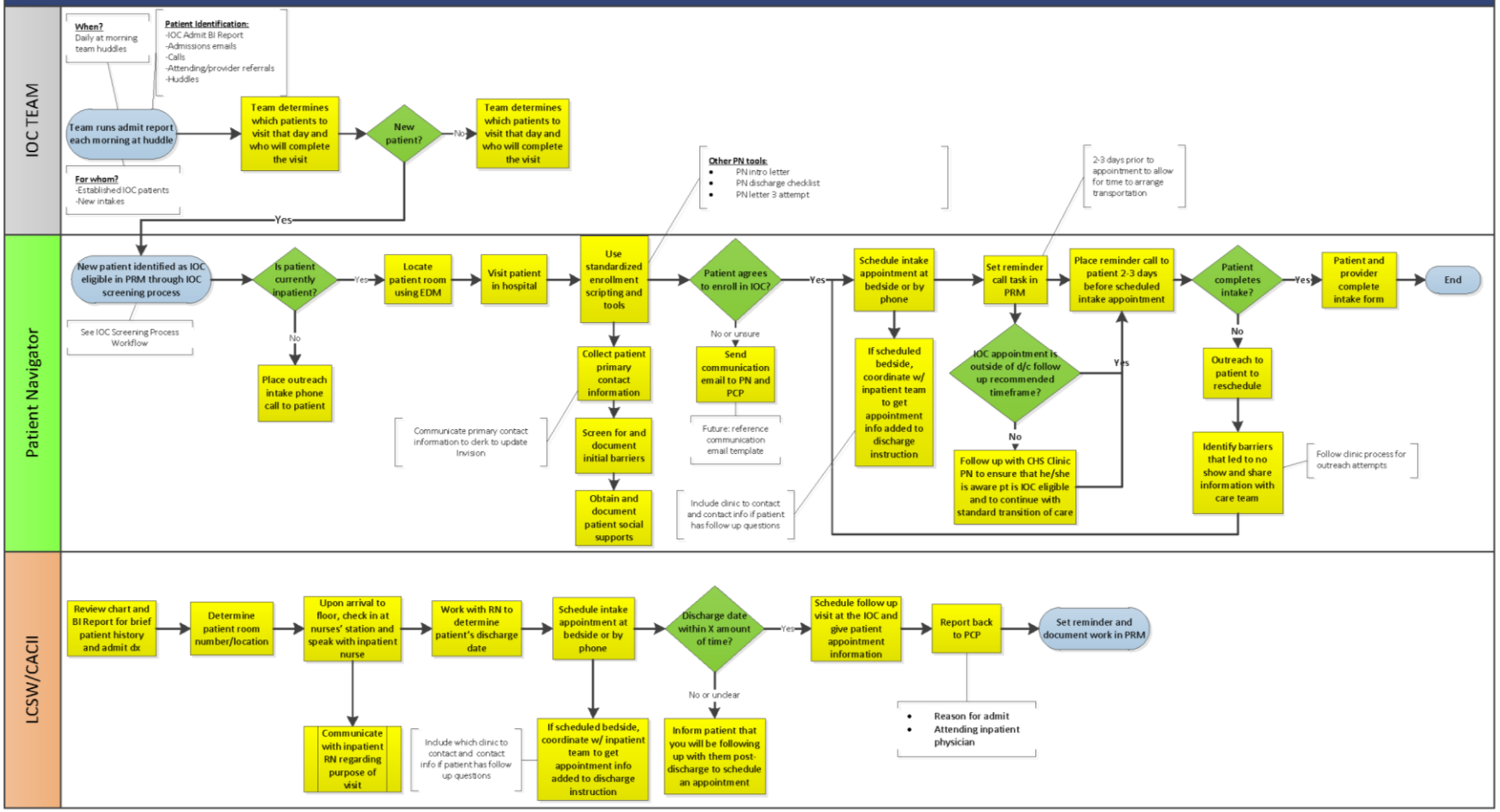
IOC Inpatient Transitions Workflow

4/4/2014



Super-Utilizer Reach Evaluation

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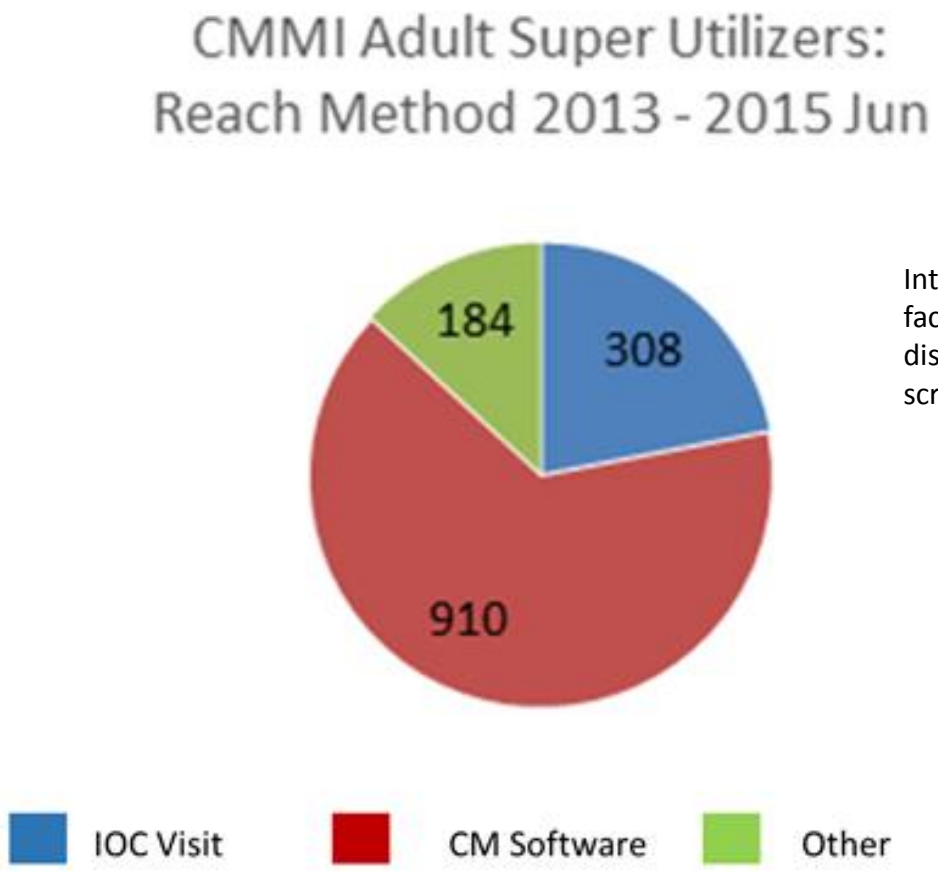

Intensity of "reach" varies: face-to-face visit, post-discharge follow-up, clinical screening

Clinical Insights re: Tiering/Triggering

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- Tiering – Who needs closer monitoring?
  - Considers medical burden PLUS other factors
  - Social determinants of health, avoidable utilization, possibility for cost avoidance, potential for health improvement
- Triggering – When do we act?
  - Needs to include some measure of patient activation/readiness
  - May be opportunistic (when patient interacts with the system)
- Gaining clinical acceptance for tiering takes clinical involvement in the process – transparency
- Tiering can help risk-adjust primary care panels/allocate staff resources
- However, DH has found using tiers to help match resources to patient need easier for a separate clinic focused on high-risk patients than for similar patients seen in regular primary care
- Population health requires culture change – is that patient “my” patient?

Acknowledgements and Disclaimers

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- The contents of this presentation are for internal use only and has not been CMS approved
- Denver Health's 21st Century Care project is supported by the Department of Health and Human Services, Centers for Medicare & Medicaid Services, Contract Number 1C1CMS331064.
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Feedback/Questions

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