

# Advancing Understanding of Health Care Delivery Using the Compendium of U.S. Health Systems

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#### Presenters



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#### Welcome

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## Road map

#### / Welcome

- / Overview of the Comparative Health System Performance (CHSP) Initiative
- / Compendium of U.S. Health Systems
- / Leveraging the Compendium to Analyze Health Systems
  - Advanced practice clinicians in health systems
  - Health system participation in Medicare Alternative Payment Models
- / Discussion

#### / Wrapping up



# **CHSP** Initiative organization

#### **AHRQ CHSP Initiative**

Goal: Understand the factors that affect health systems' use of patient-centered outcomes research (PCOR) and identify best practices in disseminating and using PCOR





## The coordinating center

#### **Mathematica**

Project director: Eugene C. Rich Deputy directors: David J. Jones and Genna R. Cohen

#### / The coordinating center collaborates with AHRQ to:

- Convene stakeholders and technical experts
- Facilitate collaboration between the Centers of Excellence
- Support the synthesis of research findings and analyze data
- Promote dissemination of research on health systems
- Develop a compendium on health systems that includes information on system characteristics





# Compendium of U.S. Health Systems

**David Jones** 

January 12, 2021

# Roadmap

#### / Overview of the Compendium

- Compendium list of health systems
- Hospital linkage file
- Group practice linkage file

#### / Using the Compendium to examine health systems

- Putting it all together
- System characteristics included in the Compendium
- Linking to external data sources



#### **Motivation**

- / Consolidation is a fact of life for health care delivery in the United States. Health systems now touch all aspects of care for many patients.
- / Thus, consolidation could have large effects on cost and quality of care.
- / But there is no agreed-upon definition of a health system or way of identifying systems.

AHRQ's Compendium of U.S. Health Systems is the first publicly available database of health systems and linkages to system hospitals and group practices, opening many opportunities to examine how health systems operate to deliver care.





## Identifying health systems

- / Convened a workgroup with the Centers of Excellence in 2016
- / Started with a simple and relatively unambiguous (albeit narrow) working definition of a health system that can be brought into operation with available data

"A health system includes at least one hospital and at least one group of physicians that provide comprehensive care (including primary and specialty care) and are connected with each other and with the hospital through common ownership or joint management."



/ Using this definition of a health system, organizations must have at least:

- 1 non-federal general acute care hospital
- 50 total physicians
- 10 primary care physicians



- / Lists of health systems operating in 2016 and 2018 that meet the working definition
- / Data sources: IQVIA OneKey and American Hospital Association (AHA) data
  - In 2016, we used IQVIA HCOS and SK&A data. In 2018, we used the combined IQVIA OneKey data.
- / 626 systems in 2016; 637 systems in 2018

/ https://www.ahrq.gov/chsp/data-resources/compendium.html



CHSP) Initiative	2018
About CHSP	2010
Data Resources	The <b>Compendium of U.S. Health Systems</b> is composed of 637 U.S. health systems, defined in this analysis to include at least one hospital and at least one group of physicians providing comprehensive
Compendium of U.S. Health Systems	care, and who are connected with each other and with the hospital through common ownership or joint management.
Technical Documentation	The Compendium database includes:
Data Highlights	<ul> <li>Columns A-D: System identification number (a unique number assigned by AHRQ), name, home offic city, and State.</li> </ul>
	Columns E-H: Indicators of which data source identified the health system and health system
CHSP Publications	<ul> <li>identification numbers in the originating data source.</li> <li>Columns I-Q: Total counts of system hospitals, physician groups, physicians, primary care physicians,</li> </ul>
What's New	extent to which systems own or manage hospitals in multiple States, total acute care beds, discharges and residents.
	Columns R-Y: Variables identifying the extent to which systems include investor-owned
	hospitals, serve children, include teaching hospitals, and serve a disproportionately high share of low- income and uninsured individuals.
	If you would like to report a possible data discrepancy, please email CHSP@ahrq.hhs.gov.



#### 2018 Compendium Files

- <u>All Compendium Files</u> (Zip, 2.4 MB)
- Excel File—Your computer should automatically prompt you to open the file in a spreadsheet application to view the data.
  - <u>Compendium of U.S. Health Systems</u> (CSV, 71 KB)
  - <u>Compendium with searchable and sortable fields</u> (XLS, 81 KB)

#### Technical Documentation

- Technical Documentation Report (PDF, 1.3 MB)
  - Appendix A. OneKey and AHA Methodologies (PDF, 271 KB)
  - Appendix B. Automated Matches (PDF, 432 KB)
  - Appendix C. Data Dictionary (PDF, 263 KB)



	А	В	С	D	Е	F	G	Н
1	health_sys_id	health_sys_name	health_sys_city	health_sys_state	in_onekey	in_aha	onekey_id	aha_sysid
2	HSI0000008	Adena Health System	Chillicothe	ОН	1	1	17780403	0895
3	HSI0000010	Adventist Health System	Altamonte Springs	FL	1	1	17773293	4165
4	HSI0000011	Adventist Health	Roseville	CA	1	1	17773620	0235
5	HSI0000012	Adventist Healthcare	Gaithersburg	MD	1	1	17773292	0214
6	HSI0000018	Alameda Health System	Oakland	CA	1	1	18283551	0225
7	HSI0000019	Albany Medical Center	Albany	NY	1	0	18202149	
8	HSI0000020	Albert Einstein Healthcare Network	Philadelphia	PA	1	1	18150651	1685
9	HSI0000021	Alecto Healthcare Services	Irvine	CA	1	1	18394721	1020
10	HSI0000025	Allegheny Health Network	Pittsburgh	PA	1	1	17773987	0199
11	HSI0000029	Allina Health System	Minneapolis	MN	1	1	17773295	0041
12	HSI0000032	Altru Health System	Grand Forks	ND	1	0	17830969	
13	HSI0000034	Anderson Regional Health System	Meridian	MS	1	0	18359667	
14	HSI0000036	Ann and Robert H Lurie Childrens Hospital	Chicago	IL	1	0	17773934	
15	HSI0000038	Anne Arundel Health System	Annapolis	MD	1	0	17830970	
16	HSI0000041	Appalachian Regional Healthcare	Lexington	KY	1	1	17774074	0145
17	HSI0000042	Appalachian Regional Healthcare System	Boone	NC	1	1	18197550	0866
18	HSI0000045	Archbold Medical Center	Thomasville	GA	1	1	17830971	0104
19	HSI0000046	Ardent Health Services	Nashville	TN	1	1	17847721	0069
20	HSI0000048	Jefferson Health	Radnor	PA	1	1	17773319	7775
	chsp_com	pendium_2018 (+)			-		4	



#### Hospital linkage file



### Hospital linkage file

/ Lists hospitals in 2016 and 2018 and links those in systems to the Compendium lists of health systems

- Links to the lists of systems using a unique Compendium ID
- Also includes CMS Certification number (CCN) to link to external data sources
- / Data sources: IQVIA OneKey and AHA data
- / 70% of hospitals were in systems in 2016; 72% in 2018.



- Hospital Linkage File—We recommend that Excel users download only the Excel version of the file. If
  Excel is used to open the CSV file, the program will automatically drop the zeros in fields with leading
  zeros.
  - Excel (534 KB)
  - <u>CSV file</u> (790 KB)
- Technical Documentation
  - <u>Compendium Hospital Linkage File, Technical Documentation</u> (PDF, 549 KB)
    - <u>Appendix A. Non-Federal General Acute Care Flag</u> (PDF, 195 KB)
    - <u>Appendix B. Data Dictionary Hospital Linkage File</u> (PDF, 203 KB)



## Hospital linkage file

	А	В	C	D	E	F	G	I	J
	compendium_								
1	hospital_id	ccn	hospital_name	hospital_street	hospital_city	hospital_state	hospital_zip	health_sys_id	health_sys_name
2	CHSP00007127	010018	Callahan Eye Foundation Hosp	1720 University Blvd	Birmingham	AL	35233	HSI00001116	UAB Health System
3	CHSP00001741	010025	Eamc Lanier	4800 48th St	Valley	AL	36854	HSI0000325	East Alabama Medical Center
4	CHSP00004432	010054	Decatur Morgan Hospital Parkway Campus	1874 Beltline Rd Sw	Decatur	AL	35601	HSI0000467	Huntsville Hospital Health System
5	CHSP00002927	010102	John Paul Jones Hospital	317 Mcwilliams Ave	Camden	AL	36726		
6	CHSP00004643	010145	Northport Medical Center	2700 Hospital Dr	Northport	AL	35476	HSI0000297	DCH Health System
7	CHSP00007128	010167	Uab Highlands	1201 11th Ave S	Birmingham	AL	35205	HSI00001116	UAB Health System
8	CHSP00001063	01022F	Central Alabama Veterans Health Care System	2400 Hospital Rd	Tuskegee	AL	36083		
9	CHSP00007191	014016	Usa Healthcare Psych Services Llc	1910 Cherokee Ave Sw	Cullman	AL	35055		
10	CHSP00007991	015049	Eastern Shore Rehabilitation And Health Center	101 Villa Dr	Daphne	AL	36526		
11	CHSP00008276	027007	Sitka Community Hospital	209 Moller Ave	Sitka		99835		
12	CHSP00008210	027009	Petersburg Medical Center	103 Fram St	Petersburg	AK	99833		
13	CHSP00006816	030019	Tempe Saint Lukes Hospital Campus Of Saint Luk	1500 S Mill Ave	Tempe	AZ	85281	HSI00001037	Steward Health Care System
14	CHSP00000985	030100	Carondelet Heart And Vascular Institute	1601 W Saint Marys Rd	Tucson	AZ	85745	HSI00001066	<b>Tenet Healthcare Corporation</b>
15	CHSP00000214	030102	Abrazo Arizona Heart Hospital	1930 E Thomas Rd	Phoenix	AZ	85016	HSI00001066	<b>Tenet Healthcare Corporation</b>
16	CHSP00007842	030118	Yavapai Regional Medical Center East Campus	7700 E Florentine Rd	Prescott Valley	AZ	86314	HSI00001273	Yavapai Regional Medical Center
17	CHSP00007978	033040	Dignity Health East Valley Rehab Hos	1515 W Chandler Blvd	Chandler	AZ	85224	HSI0000314	Dignity Health
18	CHSP00008240	033041	Rehabilitation Hospital Of Northern Arizona	1851 N Gemini Dr	Flagstaff	AZ	86001		
19	CHSP00007940	033830	Copper Queen Community Hospital	101 Cole Ave	Bisbee	AZ	85603		
	→ chsp_h	ospital_	linkage_2018 +						



#### **Group practice linkage file**



# Group practice linkage file

/ Lists group practices (Tax Identifier Numbers (TINs)) in 2016 and 2018 and links those in systems to the Compendium lists of health systems

- Includes all group practices with more than one physician billing Medicare
- Links to the lists of systems using a unique Compendium ID
- Also includes information to link to external data sources
- / Used Medicare Data on Physician Practice and Specialty (MD-PPAS) to identify sets of group practices and physicians to be considered for linkages
- / Combined information on possible linkages from a host of data sources to identify final linkages



# Group practices and physicians in systems

	2	016	2018		
	Total	% in systems	Total	% in systems	
Excluding single-physician practices					
Group practices	41,153	13.0	39,103	15.7	
Physicians	556,858	51.7	585,012	56.3	
Including single-physician practices					
Group practices	128,836	4.1	117,214	5.3	
Physicians	644,541	44.7	663,123	49.6	



# Group practice linkage file

- Group Practice Linkage File—A new data file added to AHRQ's Compendium of U.S. Health Systems identifies 39,103 physician group practices and shows which are part of health systems. Two versions are available. We recommend that Excel users download only the Excel version. If Excel is used to open the CSV file, the program will automatically drop the zeros in fields with leading zeros.
  - Excel (2.6 MB)
  - <u>CSV file</u> (3.7 MB)
- Technical Documentation
  - Group Practice Linkage File, Technical Documentation (PDF, 749 KB)



# Group practice linkage file

	А	В	С	D
1	tin_name	pecos_pac_ids	health_sys_id	health_sys_name
2	1 COMMUNITY WELLNESS & HEALTH INC	3274795547		
3	1960 Family Practice Pa	2365430949		
4	67TH STREET OBGYN PLLC	7911258165		
5	A1 IMAGING CENTERS LLC	4385704857		
5	ABRAHAM LINCOLN MEMORIAL HOSPITAL	9436040573	HSI0000648	Memorial Health System
7	ACCESS 2 HEALTHCARE LLC	6507928090		
3	ADDISON CENTRAL PATHOLOGY SC	0840288304		
)	ADMINISTRACION DE SERVICIOS MEDICOS D	4385715671		
0	ADVANCED DIAGNOSTIC PATHOLOGY ASSOC	5890890685		
1	ADVANCED MEDICAL RESOURCES, LLC	0941448070		
2	ADVANCED PATHOLOGY ASSOCIATES, LLC	6406842962		
3	ADVANCED WOMEN'S HEALTH SPECIALISTS F	8224110374		
4	ADVANTAGE IMAGING, LLC	4284712019		
5	ADVOCATE NORTH SIDE HEALTH NETWORK	9537063904	HSI00001277	Advocate Aurora Health
6	AESTHETIC PLASTIC AND RECONSTRUCTIVE S	4981650397		
7	AFFILIATED PATHOLOGISTS PA	0042299679		
8	AGHABY COMPREHENSIVE COMMUNITY HEA	3476851817		
9	AHS HOSPITAL CORP	0648189134	HSI0000060	Atlantic Health System
20	ALAMO NAVAJO SCHOOL BOARD, INC	1850589284		
•	) Output (+)			



#### Using the Compendium to examine health systems



# Putting it all together

	А	В	С	D	E	F	G	Н
1	health_sys_id	health_sys_name	health_sys_city	health_sys_state	in_onekey	in_aha	onekey_id	aha_sysid
2	HSI0000008	Adena Health System	Chillicothe	ОН	1	1	17780403	0895

	A	В	С	D		E	F	G	I	J	
	compendium_										
1	hospital_id 💌	ccn 🖵 î	hospital_name	hospital_street	٣	hospital_city 💌	hospital_sta 💌	hospital_z •	health_sys_ <	health_sys_name	health_sys_city
537	CHSP0000064	360159	Adena Regional Medical Center	272 Hospital Road		Chillicothe	OH	45601	HSI0000008	Adena Health System	Chillicothe
589	CHSP0000063	361304	Greenfield Area Medical Center	550 Mirabeau Street		Greenfield	OH	45123	HSI0000008	Adena Health System	Chillicothe
617	CHSP0000065	361334	Pike Community Hospital	100 Dawn Lane		Waverly	ОН	45690	HSI0000008	Adena Health System	Chillicothe

A	В	С	D	E	F	G	Н
1 tin_name	pecos_pac_i	health_sys_i	health_sys_name	tin_name_md_ppas	• state •	md_do_r ▼	np_pa = :
28166 Adena Medical Group Llc	1153456579	HSI0000008	Adena Health System	Adena Medical Group Llc	OH	145	76
28700 Jackson Family Practice Llc	9234435249	HSI0000008	Adena Health System	Jackson Family Practice Llc	OH	2	0
29154 Ross Emergency Group Pc, Inc	2062681646	HSI0000008	Adena Health System	Ross Emergency Group Pc, Inc	OH	17	7



# System characteristics included in the Compendium

#### / Counts of:

- Physicians
- Primary care physicians
- Medical groups
- Nurse practitioners
- Physician assistants
- Hospitals
- Hospital beds
- Hospital discharges
- Nursing homes

- / Geographic scope
- / Ownership
- / Teaching intensity
- / Extent to which hospitals are safety net hospitals
- / Alternative Payment Model (APM) participation

#### / Offers a health plan

- Indicators for any plan and plan types
- Medicare Advantage plan contracts and enrollment



### Linking to external data sources

#### / Hospital linkages

- CCN (e.g., AHA annual survey, provider of services, and hospital cost reports data)

#### / Group practice and physician linkages

- TIN name (e.g., IRS 990 and MD-PPAS)
- PAC ID (e.g., PECOS and Physician Compare)
- Unique linkages to MD-PPAS



#### Resources

#### / Technical documentation

- Compendium list of health systems
- Hospital linkage file
- Group practice linkage file

#### / Analyses conducted using the Compendium

- Consolidation and health systems in 2018 (Health Affairs, 2019)
- Landscape of U.S. health systems (Medical Care Research and Review, 2020)
- Consolidation of providers 2016 to 2018 (Health Affairs, 2020)
- Consolidation of providers by physician specialty (Health Services Research, 2020)
- Vertical integration and performance under Comprehensive Care for Joint Replacement (<u>Health</u> <u>Services Research, 2020</u>)
- Characteristics of academic-affiliated health systems (Academic Medicine, 2020)
- Variation in consolidation of providers by market (Health Affairs, 2021)



## Example findings reported in data briefs





Percentage of hospital discharges from health systems









Among States, an average of 89.9 percent of hospital discharges are from hospitals in health systems, ranging from 43.4 percent (WY) to 99.6 percent (DE).



## Other examples of findings





#### **Questions?**





# Advanced Practice Clinicians in Practice Settings Affiliated with Health Systems

Rachel Machta David Jones Michael Furukawa Arlene Bierman Robert McNellis Chunliu Zhan Eugene Rich

January 12, 2021

#### **Motivation**

#### / Two concurrent trends:

- Growing numbers of advanced practice clinicians as key members of health care workforce
- Growing consolidation of physician practices and hospitals into vertically integrated health systems

Both trends have important implications for the cost and quality of care, but relatively little is known about the intersection of these trends.



## Objectives

- / To quantify employment of nurse practitioners and physician assistants with health systems
- / To examine variation by practice settings, practice type, state, and scope of practice environment


## Data

#### / The 2018 IQVIA OneKey data

- To identify all nurse practitioners and physician assistants in the United States and their affiliations with systems and their practice setting

#### / The 2018 Compendium of U.S. Health Systems

- To link nurse practitioners and physician assistants with the 637 vertically integrated health systems in the United States and define system characteristics

/ The American Association of Nurse Practitioners for NP scope of practice (SOP) environment and Valentin et al., 2020 for physician assistant SOP environment

- Defined as: full, reduced, and restricted practice



### Results road map

Percentage of Advanced Practice Clinicians (APCs) employed in health systems by:





# Percentage of nurse practitioners and physician assistants in different practice settings





# Percentage of nurse practitioners and physician assistants employed in health systems, overall and by practice setting





# Percentage of nurse practitioners and physician assistants in different practice site types



# Percentage of nurse practitioners and physician assistants employed in health systems, by practice site type





# Percentage of nurse practitioners and physician assistants employed by single specialty medical practices





# Percentage of nurse practitioners and physician assistants employed in health systems, by specialty setting





### Results road map





# Percentages of nurse practitioners and physician assistants employed in health systems, by state



#### Nurse practitioners

Quartile 1 (8.8% to 32.8%) Quartile 2 (33.4% to 40.0%) Quartile 3 (40.7% to 49.0%) Quartile 4 (49.2% to 63.4%)

#### **Physician assistants**



 Quartile 1 (2.9% to 34.9%)

 Quartile 2 (34.9% to 43.0%)

 Quartile 3 (43.9% to 49.9%)

 Quartile 4 (51.3% to 67.7%)



#### Nurse practitioners and physician assistants employed in health systems, by state SOP environments

Nurse practitio		actitioners	ioners Physician assistants		
SOP environment	# per capita	% in systems	# per capita	% in systems	
Full	9.1	40.9	5.0	49.1	
Reduced	9.0	45.1	3.4	39.8	
Restricted	7.8	35.5	3.6	45.2	



#### Discussion

- / A substantial share of nurse practitioners and physician assistants were employed in practice settings affiliated with systems.
- / Nurse practitioner and physician assistant employment trends by systems generally mirror other trends in consolidation:
  - Nurse practitioners and physician assistants employed in hospitals are much more likely to be in systems than those in medical practice sites, long-term care, and other facilities.
  - Nurse practitioners and physician assistants employed by cardiology, hematology/oncology, and general surgery are the most likely to be affiliated with systems, and those employed by psychiatry and dermatology are the least likely.



## Discussion

- / The number of nurse practitioners and physician assistants in systems vary by system characteristics.
  - Systems in multiple states, offering a health plan, and participating in APMs have more nurse practitioners and physician assistants on average, controlling for systems size and other system characteristics.
- / There is not a clear relationship between nurse practitioners and physician assistants in systems and state SOP environment.

#### / Future considerations:

- Policies aimed at the delivery of care by advanced practice clinicians should consider that a substantial percentage of nurse practitioners and physician assistants are operating under systems (particularly in the hospital setting).
- More work is needed to understand potential effects of this consolidation on the cost and quality of care to inform these policies.



#### **Questions?**





# Health System and Physician Participation in Medicare Alternative Payment Models

Danielle Whicher Rachel Machta David Jones Eugene Rich Michael Furukawa

January 12, 2021

# Road map

#### / Background

- What is an APM?
- Why is it important to look at who is participating?

#### / Methods

- / Results
- / Policy implications



#### Background



### APMs

/ Definition: "An Alternative Payment Model (APM) is a payment approach that gives added incentive payments to provide high-quality and cost-efficient care."<sup>1</sup>

#### / Importance

- Most health care services are reimbursed by health insurers on a fee-for-service basis. This incentivizes health care providers to provide more services.
- Health care spending accounted for 17.7 percent of the U.S. gross domestic product in 2019 and is higher than other OECD countries. Yet U.S. health outcomes are worse in many cases.
- The Affordable Care Act created the Center for Medicare & Medicaid Innovation to develop and test alternative payment and delivery models.

<sup>1</sup> <u>https://qpp.cms.gov/apms/overview</u>





- / Accountable care organizations (ACOs): "Groups of doctors, hospitals, and other health care providers, who come together voluntarily to give coordinated high-quality care to their Medicare patients."<sup>2</sup>
- / Episode-based payment (EBP) models: Set "a single spending target for all applicable health care services provided during a clinical episode of care over a specified time period."<sup>3</sup>
- / Primary care transformation (PCT) models: Incentivize primary care practices to use health information technology and data "to transform their delivery of care while being accountable for the cost and quality of care their patients receive."<sup>4</sup>

<sup>2</sup> https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO

<sup>3</sup> <u>https://www.aha.org/system/files/content/16/issbrief-bundledpmt.pdf</u>

<sup>&</sup>lt;sup>4</sup> <u>https://jamanetwork.com/journals/jama/fullarticle/2513625</u>



#### Research objective

/ To present new data on the percentage of health systems and physicians in 2018 that participated in different types of Medicare APMs.



#### **Methods**



### Data

#### / CMS's APM Management System database

- Has data on all providers (National Provider Identifiers) and practices (TINs) participating in Medicare APMs and the APMs they are participating in
- Limited the data set to APMs that are national in scope and that influence payments to providers

/ Linked to the 2018 group practice linkage file to determine which systems had affiliated physicians participating in Medicare APMs



#### Medicare APMs

Model type	Model name	
ACO	Medicare Shared Saving Program	
	Comprehensive End-Stage Renal Disease Care Model	
	Next Generation Accountable Care Organization Model	
EBP	Bundled Payments for Care Improvement Initiative	
	Comprehensive Care for Joint Replacement Model	
	Oncology Care Model	
РСТ	Comprehensive Primary Care Plus	



#### **Results**



### Physician participation in Medicare APMs

Percentage of physicians billing Medicare in 2018 that participated in a Medicare APM 60 50 40 30 20 10 0 Overall System affiliated Not system affiliated





# Physician participation in Medicare APMs

	Physicians			
Medicare APM type	Overall (n = 663,123)	System affiliated (n = 329,124)	Not system affiliated (n = 333,999)	
ACO	280,345	178,338	102,007	
Episode-based payment	19,229	7,254	11,975	
Primary care transformation	10,570	6,673	3,897	



# System-level physician participation in Medicare APMs





## System participation in Medicare APMs



- 68% of health systems participated in Medicare APMs.
- / Larger health systems (with 500+ physicians) and those that were church owned were more likely to participate than systems without these features.

#### **Policy implications**



# **Policy implications**

- / The results demonstrate the substantial reach of health care payment reform in the Medicare program. To fully transform the U.S. health system, many more providers will have to engage in APMs with greater financial risk.
- / Physicians' and health systems' participation in Medicare APMs is driven by participation in ACOs, with relatively few participating in EBP and PCT models.
  - EBP and PCT models on specific types of care or health conditions, but additional physicians should be engaged.
  - Future research should examine whether health systems participating in multiple Medicare APM types are implementing those APMs in the same markets and how those systems are coordinating their participation.
- / Participation will likely increase. CMS is building its portfolio with additional EBP and PCT models, including the Radiation Oncology Model and Primary Care First.



#### **Questions?**



#### Contact us

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