

# EFFECT OF SOCIAL DETERMINANTS OF HEALTH SCREENING ON COMPLEXITY TIERING FOR CSHCN

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**BACKGROUND:** Many centers have developed claims and clinical data-based algorithms to assess the complexity of children with special needs (CYSHCN) and to allocate care coordination resources to address their needs. The role of social determinants of health (SDH) in measurement of these needs is not well defined.

**OBJECTIVE:** To determine the added contribution of SDH screening to an existing care complexity tiering system, among children seen for primary care (PC) and complex care (CC) at a large children's hospital.

**METHODS:** All children seen in a large PC teaching clinic (n=12,000) and a large CC clinic (n=3,700) at a major urban children's hospital were assigned a 4-level medical complexity tier based on a proprietary claims-based algorithm, augmented by clinical information about their needs and technology dependence. (1=healthy, 4=highly complex). During 2016, visit-administered questionnaires were used to screen for SDH in these two clinics. A 14-item psychosocial screener on paper was implemented along with an EMR flowsheet to record caregiver responses and update the patient tier level in the chart. Criteria for increasing tiers based on SDH screening were determined *a priori* through conversations with clinicians and care team members. Complexity scores could increase by up to 2 tiers, but no further than tier 4. Differences between proportions of children changing tiers in each clinic were assessed using Fisher's exact test.

**RESULTS:** Among 1,214 returned SDH questionnaires, 606 (50%) were positive for one or more SDH. This resulted in an increase in tier for 256 children with positive screens (42%; 16% in CC and 84% in PC;  $p<0.001$  for difference between clinics). Children seen in each clinic in each tier, before and after SDH screening, are described in the Table. For children in each clinic, the biggest change was to decrease the proportion of tier 1 (healthy) children. However, most changes among children in the PC group were from tier 1 to tier 2, while changes in the CC group were more evenly distributed across tiers.

	Complex Care Clinic					Primary Care Clinic				
	Without SDH		With SDH		% change	Without SDH		With SDH		% change
	n	%	n	%		n	%	n	%	
Tier 1	147	13.2%	84	7.6%	↓5.7%	73	71.6%	36	35.3%	↓36.3%
Tier 2	159	14.3%	204	18.3%	↑4.0%	23	22.5%	52	51.0%	↑28.4%
Tier 3	525	47.2%	519	46.7%	↓0.5%	6	5.9%	12	11.8%	↑5.9%
Tier 4	281	25.3%	305	27.4%	↑2.2%	0	0.0%	2	2.0%	↑2.0%

**CONCLUSIONS:** SDH screening can substantially change care coordination needs in an already high-need population, with significant implications for resource allocation targeting SDH for both primary care and complex care clinics. Our results suggest more of an impact in the PC population, which has a larger proportion of healthy children at baseline. Resource allocation for PC should consider needs uniquely generated by SDH.



Children's Hospital Colorado

# Effect of Social Determinants of Health Screening on Complexity Tiering for CSHCN

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## BACKGROUND

- Children and youth with special health care needs (CYSHCN) need care coordination
- Population management of CYSHCN requires stratifying (“tiering”) based on needs
- The spectrum of care coordination needs is often affected by psychosocial needs
- Existing tiering methods are based on medical diagnoses and tend to neglect psychosocial needs
- Measures of social determinants of health (SDH) exist
  - Not typically done on a population level
  - Not integrated into tiering

## OBJECTIVE

To determine the added contribution of SDH screening to an existing care complexity tiering system, among children seen for primary care and complex care at a large children's hospital

## ENVIRONMENT

- Children's Hospital Colorado (CHCO): Major referral center for a 5-state area
- Complex care clinic (Special Care Clinic/SCC):
  - Largest in US, over 3700 active patients
  - Primary care for local children (~1800)
  - Co-management for the remainder
- Primary care clinic (Child Health Clinic, or CHC):
  - Main teaching clinic for large residency program and medical school
  - Comprehensive medical home model including integrated behavioral health
  - 12,000 active patients, most from the diverse population of North Aurora
  - 85% public insurance

## METHODS

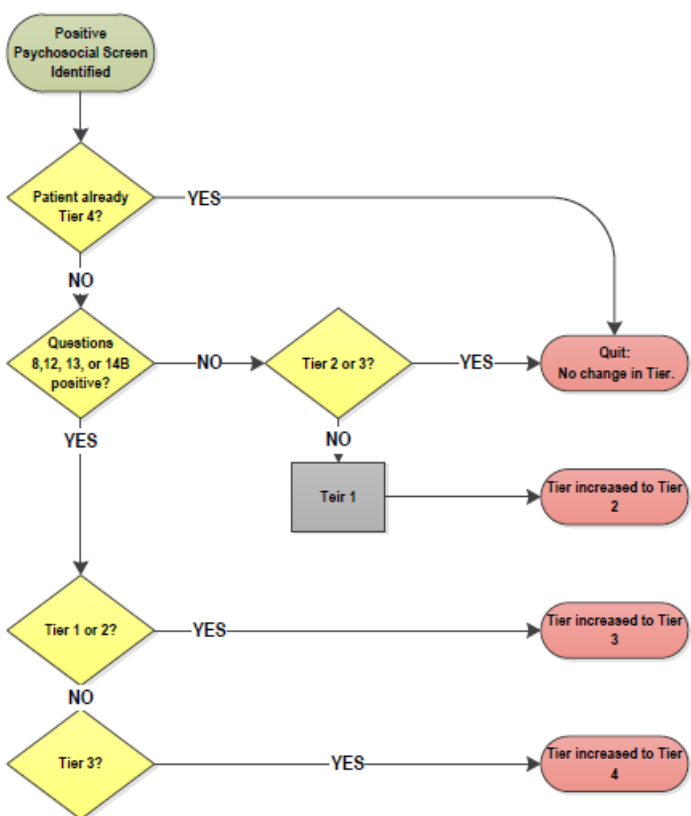
### Measures

#### Complexity

- 3M Clinical Risk Groups (CRG) based
- ED visits and known homecare needs included
- Diagnoses from all encounters in CHCO system
- Data updated every 2 weeks

#### Tiering

- Tier 1 (Healthy): CRG 1
- Tier 2 (non-complex chronic): CRG 2-5a
- Tier 3 (Moderately complex): CRG 5b-7
- Tier 4 (Highly complex): CRG 8-9



### Analysis:

- Criteria for increasing tier developed through consensus process
- Differences between proportions determined by Fisher's Exact test

## RESULTS

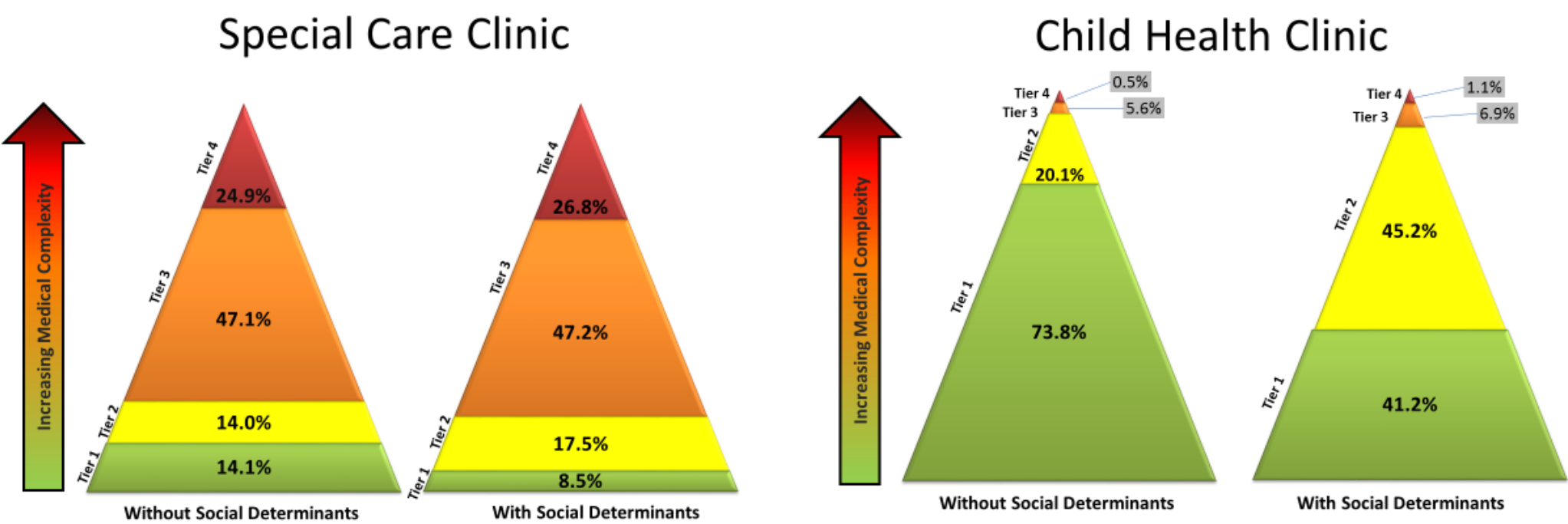
### Demographics

	Special Care Clinic	Child Health Clinic
Total screens	1655	622
Unique patients	1553	541
Age (years): n (%)		
0-<2 years	236 (15%)	271 (50%)
2-<5	316 (20%)	113 (21%)
5-<12	589 (38%)	123 (23%)
12+	412 (27%)	34 (6%)
Race/ethnicity: n (%)		
White	576 (37%)	74 (14%)
Hispanic / Latino	643 (41%)	231 (43%)
African American	151 (10%)	129 (24%)
Other / Not reported	181 (12%)	107 (20%)
Insurance: n (%)		
Public	1151 (74%)	464 (86%)
Private / commercial	395 (25%)	66 (12%)
Self Pay / Charity	7 (<1%)	11 (2%)

### Screen Results

- XX% of 2104 children screened had positive screens
- XX% in CHC, XX% in SCC (p=XXX)
- XXX children increased tier by 1 level
- XXX children increased tier by 2 levels
- Children in tiers 3-4 increased from 6.1 to 8% in CHC

	Special Care Clinic 1655 screens					Child Health Clinic 622 screens				
	Without SDH		With SDH		% change	Without SDH		With SDH		% change
	n	%	n	%		n	%	n	%	
Tier 1	233	14.1%	141	8.5%	5.6	459	73.8%	256	41.2%	32.6
Tier 2	231	14.0%	289	17.5%	3.5	125	20.1%	281	45.2%	25.1
Tier 3	779	47.1%	781	47.2%	0.1	35	5.6%	78	12.5%	6.9
Tier 4	412	24.9%	444	26.8%	1.9	3	0.5%	7	1.1%	0.6



### SDH screen

- 14 items: resource needs, food insecurity, safety, caregiver well-being
- Population-based screening in SCC began mid-2016
- Population-based screening in CHC resource-dependent, began Q4 2016
- Paper-based tool, entered into EHR

## CONCLUSIONS

- SDH screening can change care coordination needs substantially in an already high-need population
- Largest changes seen in underserved primary care population (CHC); resource needs may differ
- Largest changes in our system: tier 1 to tier 2, though “complex” population (tiers 3-4) increased in CHC by 31%

## LIMITATIONS

- Data from CHCO encounters only
- Universal population-based screening still in progress
- Clinical utility of changes to be determined

## IMPLICATIONS/NEXT STEPS

- Early experience: increasing SW/family navigator/integrated behavioral health resources critical to engage providers in screening
- Complete population-based screening
- Implement resource allocation and revise algorithms based on experience with families

## ACKNOWLEDGMENTS

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