May 16th, 12:30 PM - 12:45 PM

The Impact of Childhood Opportunity Index on Treatment Outcomes of Osteochondritis Dissecans of the Knee

Colton Schwarz
Children's Mercy Kansas City

Kennedy J. Morey
Children's Mercy Kansas City

Brian R. Lee
Children's Mercy Kansas City

Angie Vanderpool
Children's Mercy Kansas City

Kevin Latz
Children's Mercy Hospital

See next page for additional authors

Let us know how access to this publication benefits you

Authors

Colton Schwarz, Kennedy J. Morey, Brian R. Lee, Angie Vanderpool, Kevin Latz, Natalie C. Stork, Donna Pacicca, and Brian Harvey

Osteochondritis Dissecans

- Subchondral bone weakening

- Most common: Medial femoral condyle

- Premature osteoarthritis[1]

- Black children with 6.7x higher odds of unsuccessful radiographic healing[2]
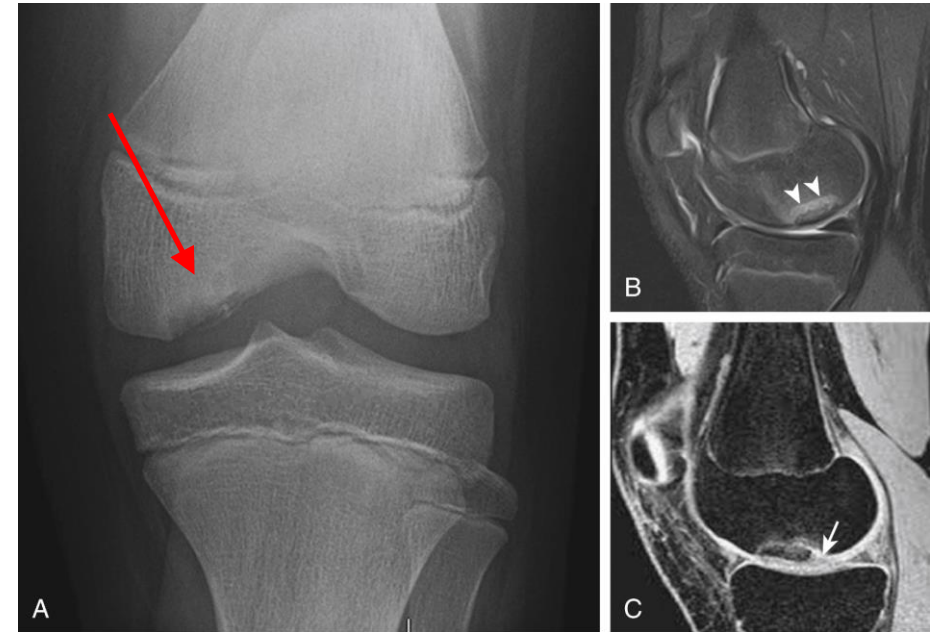
Childhood Opportunity Index 2.0

- 3 domains:
  - Education
  - Health & Environment
  - Social & Economic

- Total score → Pentiles

- Metro, State, and National-based norms
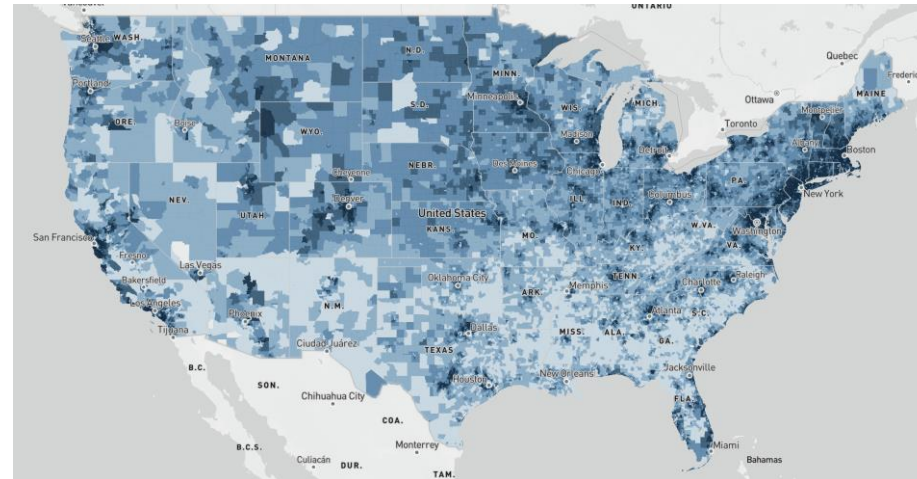
Objective

We aim to explore the relationship that Childhood Opportunity Index has on treatment outcomes of OCD of the medial femoral condyle of the knee

Methods

- Retrospective cohort study

- Age ≤ 18 years

- Jan 2015-July 2023

- Dx: Medial Femoral Condyle OCD

Methods

Total patients (N=213)

Childhood Opportunity Index

74% = Conservative

Low

Moderate

High

Very High

| Conservative N=34 | Surgical N=10 | Conservative N=35 | Surgical N=5 | Conservative N=44 | Surgical N=21 | Conservative N=45 | Surgical N=19 |
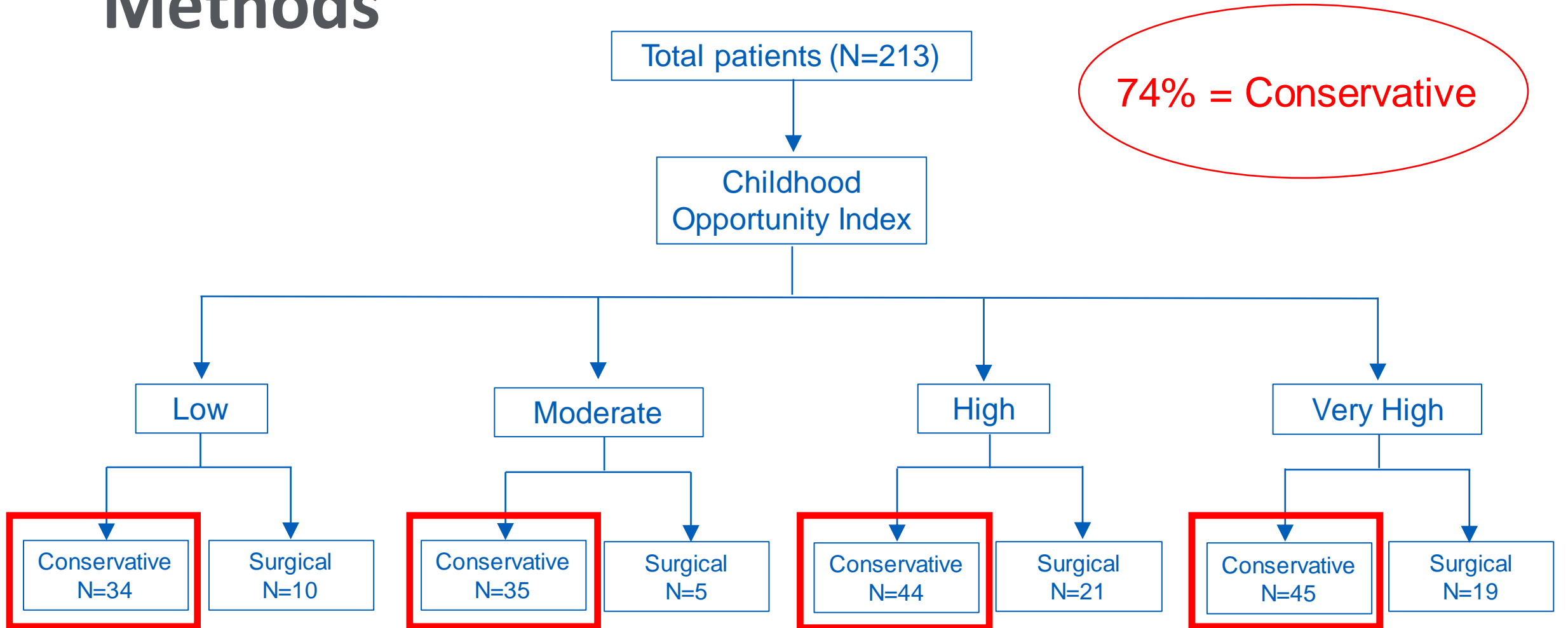
Methods

Primary outcome:
- Failure of conservative management

Secondary outcome:
- Demographics
- Return to activity/sport
- Lost to follow-up
- Physical therapy

Results

Initial conservative management (N=158)					
	Low (N=34)	**Moderate (N=35)**	**High (N=44)**	**Very High (N=45)**	**p-value**
Sex -- n (%)					0.474
Female	14 (41.2%)	9 (25.7%)	13 (29.5%)	17 (37.8%)	
Male	20 (58.8%)	26 (74.3%)	31 (70.5%)	28 (62.2%)	
Race					0.007
African American or Black	11 (32.4%)	10 (28.6%)	6 (13.6%)	4 (8.9%)	
White	18 (52.9%)	18 (51.4%)	34 (77.3%)	39 (86.7%)	
Other	4 (14.7%)	7 (20.0%)	4 (9.1%)	2 (4.4%)	
Patient age -- median [IQR]	10.5 [9.0, 12.0]	11.0 [9.0, 12.0]	11.0 [10.0, 12.5]	11.0 [10.0, 12.0]	0.791
BMI -- median [IQR]	19.2 [16.7, 22.6]	21.3 [18.7, 24.4]	19.5 [17.3, 21.0]	17.7 [16.5, 18.6]	<0.001
No sports participation	12 (40.0%)	8 (26.7%)	7 (17.5%)	5 (12.2%)	0.041

Children's Mercy KANSAS CITY | Sports Medicine Center

Results

Initial conservative management (N=158)					
	Low (N=34)	Moderate (N=35)	High (N=44)	Very High (N=45)	p-value
Sex -- n (%)					0.474
Female	14 (41.2%)	9 (25.7%)	13 (29.5%)	17 (37.8%)	
Male	20 (58.8%)	26 (74.3%)	31 (70.5%)	28 (62.2%)	
Race					0.007
African American or Black	11 (32.4%)	10 (28.6%)	6 (13.6%)	4 (8.9%)	
White	18 (52.9%)	18 (51.4%)	34 (77.3%)	39 (86.7%)	
Other	4 (14.7%)	7 (20.0%)	4 (9.1%)	2 (4.4%)	
Patient age -- median [IQR]	10.5 [9.0, 12.0]	11.0 [9.0, 12.0]	11.0 [10.0, 12.5]	11.0 [10.0, 12.0]	0.791
BMI -- median [IQR]	19.2 [16.7, 22.6]	21.3 [18.7, 24.4]	19.5 [17.3, 21.0]	17.7 [16.5, 18.6]	<0.001
No sports participation	12 (40.0%)	8 (26.7%)	7 (17.5%)	5 (12.2%)	0.041

Results

Initial conservative management (N=158)					
	Low (N=34)	Moderate (N=35)	High (N=44)	Very High (N=45)	p-value
Sex -- n (%)					0.474
Female	14 (41.2%)	9 (25.7%)	13 (29.5%)	17 (37.8%)	
Male	20 (58.8%)	26 (74.3%)	31 (70.5%)	28 (62.2%)	
Race					0.007
African American or Black	11 (32.4%)	10 (28.6%)	6 (13.6%)	4 (8.9%)	
White	18 (52.9%)	18 (51.4%)	34 (77.3%)	39 (86.7%)	
Other	4 (14.7%)	7 (20.0%)	4 (9.1%)	2 (4.4%)	
Patient age -- median [IQR]	10.5 [9.0, 12.0]	11.0 [9.0, 12.0]	11.0 [10.0, 12.5]	11.0 [10.0, 12.0]	0.791
BMI -- median [IQR]	19.2 [16.7, 22.6]	21.3 [18.7, 24.4]	19.5 [17.3, 21.0]	17.7 [16.5, 18.6]	<0.001
No sports participation	12 (40.0%)	8 (26.7%)	7 (17.5%)	5 (12.2%)	0.041

Results

Initial conservative management (N=158)					
	Low (N=34)	**Moderate (N=35)**	**High (N=44)**	**Very High (N=45)**	**p-value**
Failed conservative management -- n (%)					0.539
No	24 (70.6%)	26 (74.3%)	36 (81.8%)	35 (77.8%)	
Yes	8 (23.5%)	4 (11.4%)	6 (13.6%)	8 (17.8%)	
Unknown	2 (5.9%)	5 (14.3%)	2 (4.5%)	2 (4.4%)	
Time to surgery (weeks) -- median [IQR]	66.0 [58.0, 86.0]	22.0 [8.0, 22.0]	22.0 [18.0, 46.0]	21.0 [15.0, 72.0]	0.062
Time to surgery (clinic visits) -- median [IQR]	8.0 [7.0, 9.0]	5.0 [3.0, 5.0]	4.0 [3.0, 7.0]	4.0 [2.5, 5.5]	0.226
Returned to sports					0.011
≤ 6 months	7 (23.3%)	14 (46.7%)	19 (47.5%)	28 (68.3%)	
> 6 months	11 (36.7%)	8 (26.7%)	14 (35.0%)	8 (19.5%)	
No sports	12 (40.0%)	8 (26.7%)	7 (17.5%)	5 (12.2%)	
Physical Therapy visits -- median [IQR]	7.0 [6.0, 11.0]	5.5 [4.0, 6.5]	7.5 [5.0, 10.5]	11.0 [7.0, 17.0]	0.045
Lost to follow-up -- n (%)	12 (35.3%)	16 (47.1%)	16 (36.4%)	14 (31.1%)	0.533

Children's Mercy KANSAS CITY | Sports Medicine Center

Results

Initial conservative management (N=158)					
	Low (N=34)	**Moderate (N=35)**	**High (N=44)**	**Very High (N=45)**	**p-value**
Failed conservative management -- n (%)					0.539
No	24 (70.6%)	26 (74.3%)	36 (81.8%)	35 (77.8%)	
Yes	8 (23.5%)	4 (11.4%)	6 (13.6%)	8 (17.8%)	
Unknown	2 (5.9%)	5 (14.3%)	2 (4.5%)	2 (4.4%)	
Time to surgery (weeks) -- median [IQR]	66.0 [58.0, 86.0]	22.0 [8.0, 22.0]	22.0 [18.0, 46.0]	21.0 [15.0, 72.0]	0.062
Time to surgery (clinic visits) -- median [IQR]	8.0 [7.0, 9.0]	5.0 [3.0, 5.0]	4.0 [3.0, 7.0]	4.0 [2.5, 5.5]	0.226
Returned to sports					0.011
≤ 6 months	7 (23.3%)	14 (46.7%)	19 (47.5%)	28 (68.3%)	
> 6 months	11 (36.7%)	8 (26.7%)	14 (35.0%)	8 (19.5%)	
No sports	12 (40.0%)	8 (26.7%)	7 (17.5%)	5 (12.2%)	
Physical Therapy visits -- median [IQR]	7.0 [6.0, 11.0]	5.5 [4.0, 6.5]	7.5 [5.0, 10.5]	11.0 [7.0, 17.0]	0.045
Lost to follow-up -- n (%)	12 (35.3%)	16 (47.1%)	16 (36.4%)	14 (31.1%)	0.533

Children's Mercy KANSAS CITY | Sports Medicine Center

Results

Initial conservative management (N=158)					
	Low (N=34)	**Moderate (N=35)**	**High (N=44)**	**Very High (N=45)**	**p-value**
Failed conservative management -- n (%)					0.539
No	24 (70.6%)	26 (74.3%)	36 (81.8%)	35 (77.8%)	
Yes	8 (23.5%)	4 (11.4%)	6 (13.6%)	8 (17.8%)	
Unknown	2 (5.9%)	5 (14.3%)	2 (4.5%)	2 (4.4%)	
Time to surgery (weeks) -- median [IQR]	66.0 [58.0, 86.0]	22.0 [8.0, 22.0]	22.0 [18.0, 46.0]	21.0 [15.0, 72.0]	0.062
Time to surgery (clinic visits) -- median [IQR]	8.0 [7.0, 9.0]	5.0 [3.0, 5.0]	4.0 [3.0, 7.0]	4.0 [2.5, 5.5]	0.226
Returned to sports					0.011
≤ 6 months	7 (23.3%)	14 (46.7%)	19 (47.5%)	28 (68.3%)	
> 6 months	11 (36.7%)	8 (26.7%)	14 (35.0%)	8 (19.5%)	
No sports	12 (40.0%)	8 (26.7%)	7 (17.5%)	5 (12.2%)	
Physical Therapy visits -- median [IQR]	7.0 [6.0, 11.0]	5.5 [4.0, 6.5]	7.5 [5.0, 10.5]	11.0 [7.0, 17.0]	0.045
Lost to follow-up -- n (%)	12 (35.3%)	16 (47.1%)	16 (36.4%)	14 (31.1%)	0.533

Children's Mercy KANSAS CITY | Sports Medicine Center

Results

Initial conservative management (N=158)					
	Low (N=34)	**Moderate (N=35)**	**High (N=44)**	**Very High (N=45)**	**p-value**
Failed conservative management -- n (%)					0.539
No	24 (70.6%)	26 (74.3%)	36 (81.8%)	35 (77.8%)	
Yes	8 (23.5%)	4 (11.4%)	6 (13.6%)	8 (17.8%)	
Unknown	2 (5.9%)	5 (14.3%)	2 (4.5%)	2 (4.4%)	
Time to surgery (weeks) -- median [IQR]	66.0 [58.0, 86.0]	22.0 [8.0, 22.0]	22.0 [18.0, 46.0]	21.0 [15.0, 72.0]	0.062
Time to surgery (clinic visits) -- median [IQR]	8.0 [7.0, 9.0]	5.0 [3.0, 5.0]	4.0 [3.0, 7.0]	4.0 [2.5, 5.5]	0.226
Returned to sports					0.011
≤ 6 months	7 (23.3%)	14 (46.7%)	19 (47.5%)	28 (68.3%)	
> 6 months	11 (36.7%)	8 (26.7%)	14 (35.0%)	8 (19.5%)	
No sports	12 (40.0%)	8 (26.7%)	7 (17.5%)	5 (12.2%)	
Physical Therapy visits -- median [IQR]	7.0 [6.0, 11.0]	5.5 [4.0, 6.5]	7.5 [5.0, 10.5]	11.0 [7.0, 17.0]	0.045
Lost to follow-up -- n (%)	12 (35.3%)	16 (47.1%)	16 (36.4%)	14 (31.1%)	0.533

Children's Mercy KANSAS CITY | Sports Medicine Center

Conclusions

1. Return to sport & PT attendance significantly impacted by COI

2. Very high COI = white, lower BMI, sports participation

3. Low COI = trend towards longer duration until surgery performed

Significance

- Health disparities exist with knee MFC OCD

- Etiology is complex & multifactorial

- Need improved screening & improved access to resources

- Acknowledge potential unconscious bias

Limitations

- Lesion stability not analyzed
- Addresses may have changed
- COI very low + low combined
- Single center study

NEXT STEP:

ASSESS LESION STABILITY

Children's Mercy KANSAS CITY | Sports Medicine Center

References

1. Chau, Michael M. MD, PhD; Klimstra, Mikhail A. MD; Wise, Kelsey L. MD; Ellermann, Jutta M. MD, PhD; Tóth, Ferenc DVM, PhD, DACVS; Carlson, Cathy S. DVM, PhD, DACVP; Nelson, Bradley J. MD; Tompkins, Marc A. MD. Osteochondritis Dissecans: Current Understanding of Epidemiology, Etiology, Management, and Outcomes. The Journal of Bone and Joint Surgery 103(12):p 1132-1151, June 16, 2021. | DOI: 10.2106/JBJS.20.01399

2. Patel NM, Helber AR, Gandhi JS, Shea KG, Ganley TJ. Race Predicts Unsuccessful Healing of Osteochondritis Dissecans in the Pediatric Knee. *Orthopedics*. 2021;44(3):e378-e384. doi:10.3928/01477447-20210414-09

3. https://data.diversitydatakids.org/dataset/coi20-child-opportunity-index-2-0-database

Questions?