

Impact of Center Specific Analysis (CSA) on HCT Center Volumes

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Conflict of Interest Disclosure

Akshay Sharma

- Consultant: Spotlight Therapeutics (2020), Medexus Inc. (2021), Vertex Pharmaceuticals (2021), Sangamo Therapeutics (2022), Editas Medicine (2023)
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Background

- Public reporting of healthcare can promote quality improvement.
- Impacts on solid organ transplant:
 - Volume decreased at poorly performing kidney/liver transplant centers.
 - Mixed results of public reporting on mortality after cardiovascular procedures .
- Impact of Center Specific Analysis score reporting on HCT centers has not been evaluated.
- Public reporting of HCT centers through CSA could have implications at patient, center, and payer-level and thus may impact HCT center patient selection process, **transplant volumes**, and HCT outcomes.

Center Specific Analysis

- CIBMTR annually reports the outcomes of patients receiving hematopoietic cell transplants at transplant centers across the United States through its Center Specific Analysis.
- The CSA estimates the predicted 1-year overall survival (OS) rate and confidence limits for each transplant center based on its HCT recipient case mix from the preceding 3 years and compares it to the actual OS rate. This is reported as a score:
 - 0 (OS as expected),
 - -1 (OS worse than expected), or
 - +1 (OS better than expected);... and this is made publicly available to HCT recipients, providers, and the public.

Hypothesis

A change in Center Specific Analysis (CSA) score is associated with a change in patient volume at the index center in the same direction (negative score decreases volume, positive score increases volume or has no change), while changing volumes at surrounding centers in the opposite direction.

Rationale

1. The change in volume may occur, due to reluctance of low performance centers to take high risk patients to HCT assuming that this may improve future CSA scores.
2. Patients may be driven away from underperforming centers due to changes in insurance carrier's designated 'preferred status' and/or patient preferences/perceptions.
3. Some centers may be significantly affected resulting in loss of clinical expertise and incurring financial losses due to lower patient volumes.

Statistical Analysis

- A linear mixed model with an unstructured correlation matrix was fit to the center volume data, to account for the repeated longitudinal measurements at each center.
 - Log transformation of center volume was used to reduce skewness.
 - The resulting coefficients of the mixed model were transformed using the exponential function so that they can be interpreted as the ratio of means between groups.

Statistical Analysis

- Covariates considered:
 - **Center volume in the prior year**
 - **CSA score in the prior year**
 - CSA score change and direction
 - Calendar year
 - Center type (adult only vs. combined adult/peds)
 - Years of experience with the NMDP

Greyed out variables excluded using backwards elimination.

Multivariate Analysis: Main Model

We included 91 centers in the analysis, of which 68 had at least one CSA score change during the study period.

Prior Year CSA Score	Mean Ratio (95% CI)	p-value
0 to -1	0.923 (0.887-0.96)	<0.001
1 to -1	0.907 (0.862-0.955)	<0.001
1 to 0	0.983 (0.944-1.023)	0.389

- A prior-year CSA score of -1, as compared with a CSA score of 0, was associated with an 8% reduction in the mean TC volume while adjusting for yearly trends and increases in transplant numbers across TCs.
- Likewise, a prior-year CSA score of -1, as compared with a CSA score of +1, was associated with a 9% reduction in the mean TC volume.

Multivariate Analysis: Supplementary Model

CSA score history over previous 2 years		Mean Ratio (95% CI)	p-value
CSA score 2 years earlier	CSA score 1 year earlier		
0 or +1	0 or +1	1.000 (Reference)	
-1	0 or +1	0.844 (0.782-0.911)	<0.001
0 or +1	-1	0.885 (0.820-0.955)	0.002
-1	-1	0.864 (0.801-0.932)	<0.001

A -1 score in either of the two preceding years was associated with an 11%–16% lower volume for that center, as compared to centers without a -1 score in either of the two preceding years.

Multivariate Analysis: Results

- No interaction between **center size** (≥ 40 vs. < 40 HCTs per year) and effect of CSA score ($p=0.342$) on center volumes.

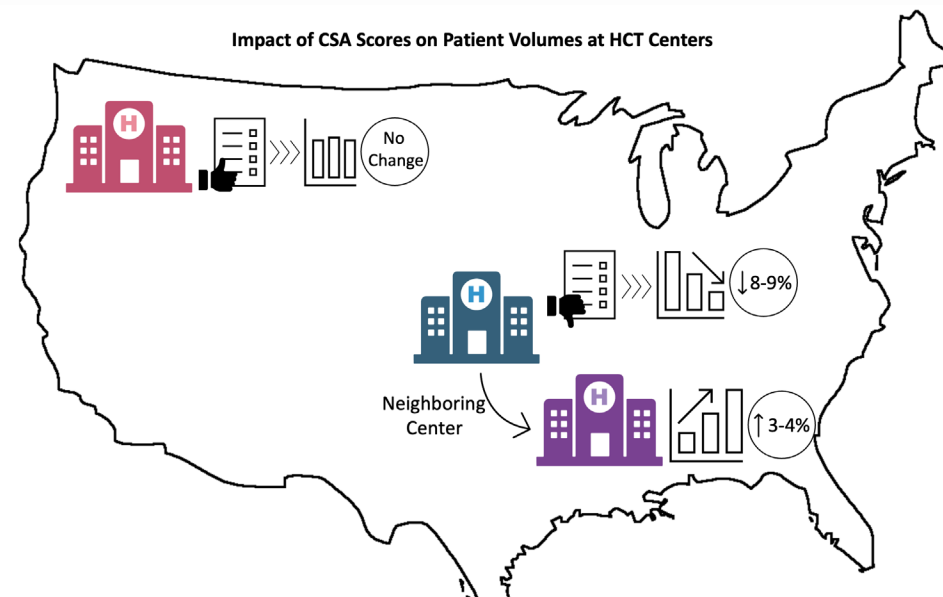
Impact of CSA score change on neighboring centers

CSA score change in the previous year	Mean ratio (95% CI)	P
Not a neighbor to a -1 center	1.000 (Reference)	
Neighboring at least one center with a CSA score of -1	1.035 (1.002-1.070)	0.037
Neighboring at least one center with a CSA score of -1 (NMDP market area definition)	1.043 (1.005-1.083)	0.029

- Being a TC neighboring at least one index TC with a -1 CSA score, was associated with a 3.5% increase in mean TC volume.
- Using the NMDP market region definition of a neighboring center, being a neighbor to at least one center with a -1 CSA performance was associated with a 4.3% increase in the mean center volume.

Conclusions

- Public reporting of TC performance affects their HCT volumes.
- TCs with a reported CSA score of -1 experience a decline in volume, whereas neighboring centers gain this patient volume.
- This decline may be due to:
 - Decrease in referrals.
 - Change in acceptance patterns.
 - Loss of preferred designation from payers.
- Additional analysis exploring whether this public reporting has an impact on patient outcomes is ongoing.



Location of the hospital figure on this representative map does not represent any actual HCT center and is for illustration only.

Thank you



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