Disclosures

USPSTF Breast Cancer Screening Guidelines in a County Hospital System: Is it time to re-evaluate screening initiation age in minority women?

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BACKGROUND

- Non-white women are diagnosed with breast cancer at younger ages and/or with more advanced disease compared to white women[1,2]
- Discrepant recommendations on screening initiation ages between 40-50 years & no recommendations account for race/ethnicity
- Early breast cancer screening proposed for non-white populations may be adversely affected by current screening guidelines[3]

	United States Preventative Services Task Force (USPSTF)	American Cancer Society (ACS)	American College of Radiology (ACR)
Screening Initiation Age (years)	50	45	40
Frequency of Screening	Biennially	Annually to 54, then biennially	Annually
When to Stop Screening	At 74 years of age	Life expectancy <10 years	Life expectancy <5-7 years

Table 1: Breast Cancer Screening Guidelines

OBJECTIVE

- Apply the USPSTF, ACS & ACR screening guidelines to understand screening rates at our institution and theoretical effect of different screening guidelines on breast cancer diagnosis in an urban, diverse and medically underserved population

METHODS

- Retrospective review of all female breast cancer patients diagnosed between 2014-2016 from a single institution
- Demographics, tumor characteristics, radiographic findings & surgical interventions evaluated
- Tumor volume was calculated using the ellipsoid volume formula $(TV=(pi/6)*W*L*H)$[4] & mammogram used to determine whether patients would have been diagnosed by screening mammography at time of diagnosis; visible lesions 1 cm or greater considered detectable

RESULTS

- **204 patients total cohort:**
  - Median age 55, 70% patients age 50+, majority patients Hispanic
- **Median tumor volume: 2.96 cm³**
  - Median invasive breast cancer tumor volume: 3.32 cm³
  - Tumor volumes among Black patients significantly larger than in White patients

RESULTS

Table 2: Racial Distribution of Age at Diagnosis & Tumor Volumes

	All Races		White	Hispanic	Black	Asian	p-value
Age at Diagnosis	n=204	%	n=26 (12.7%)	n=108 (52.9%)	n=38 (18.6%)	n=32 (15.7%)	
Median age at diagnosis (range)	55 (22-79)		55	53.5	55	58.5	One-way ANOVA, 0.343
<50	61	30.0%	6 (23.1%)	37 (34.3%)	9 (23.7%)	9 (28.1%)	X² test, 0.512
50 and over	143	70.0%	20 (76.9%)	71 (65.7%)	29 (76.3%)	23 (71.9%)	X² test, 0.512
50 and over with prior mammography	62 (of 143)	43.4%	9 (45.0%)	35 (49.3%)	9 (31.0%)	9 (39.1%)	X² test, 0.391
Tumor Volumes	n=161		n=22	n=83	n=30	n=26	
Median tumor volume (range cm3)	2.96 (0.03-88.05)		0.90 (0.08-15.7)*	2.56 (0.03-88.05)	4.09 (0.06-60.07)*	3.77 (0.04-31.15)	One-way ANOVA, 0.040
Median invasive breast cancer tumor volume (range cm3)	n=155 3.32 (0.03-88.05)		n=22 0.90 (0.08-15.7)*	n=78 2.76 (0.03-88.05)	n=30 4.09 (0.06-60.07)*	n=25 3.77 (0.04-31.15)	One-way ANOVA, 0.030

- **189 patients with mammogram from time of diagnosis included in screening guideline application**
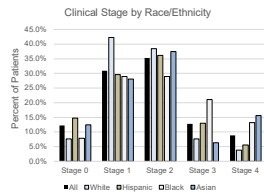- **45% diagnosis by screening among patients 50+ vs. 96% diagnosis by palpable mass among patients <40 years**

Clinical Stage by Race/Ethnicity

Figure 1: Racial Distribution of Clinical Stage

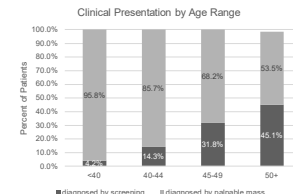
Clinical Presentation by Age Range

Figure 2: Age Distribution of Clinical Presentation

	# Screening-Age Pts Captured	Total # Screening-Age Pts	# Screening Age Pts Missed	True % Dx Among Pts of Screening Age	True % Dx by Screening (all ages)
USPSTF in practice (age 50 and over)	64	142	78	45.1%	36.6%
Theoretical Application of Screening Guidelines	# Screening-Age Pts Captured*	Total # Screening-Age Pts	# Additional Pts Captured	% Dx Among Pts of Screening Age**	Theoretical % Dx by Screening***
USPSTF guidelines (age 50 and over)	131	134	67	97.8%	69.3%
ACS guidelines (age 45 and over)	152	155	81	98.1%	80.4%
ACR guidelines (age 40 and over)	162	169	89	95.9%	85.7%

* # of pts of screening-age who had 'positive' mammographic finding at time of diagnosis
** # screening-age pts captured divided by total # screening-age pts
*** # screening-age pts captured divided by total # of pts with mammographic information from time of diagnosis (n=189)

Table 4: Theoretical Application of Screening Guidelines

RESULTS

- **% diagnosis by screening increased from 45% to 98% among pts 50+ with 'perfect' USPSTF screening**
  - 37% → 69% diagnosis by screening all ages
- **ACS screening: 98% diagnosis by screening among pts 45+**
  - 80% diagnosis by screening all ages
- **ACR screening: 96% diagnosis by screening pts 40+**
  - 86% diagnosis by screening all ages

DISCUSSION

- **Limitations**: small sample size & retrospective study of population with *known* breast cancer
- **Most patients presented with mammogram-detectable tumors given most tumor volumes measured >1cm³**
- **In our patient population, lowering screening age would increase diagnosis by screening vs. palpable mass**
- Diagnosis by screening would increase to 86% if ACR-recommended initial screening age used
- **Increased screening compliance could improve earlier diagnosis and BCT-eligibility**
- Optimal USPSTF compliance alone would increase % diagnosis by screening from 45% to 98% among patients aged 50+

CONCLUSIONS

- **Applying these lower age limit screening guidelines to our breast cancer patients in a diverse, medically underserved setting increased the theoretical detection rate by 33%, 44% & 49%**
- **Future studies needed to re-evaluate which screening guidelines to follow in large health care systems that serve predominantly minority patients, and to evaluate cost vs. benefit of earlier screening**

REFERENCES
1. Aziz H, Hussain F, Sohn C, et al. Early onset of breast carcinoma in African American women with poor prognostic factors. Am J Clin Oncol. 1999;22(5):436-440. doi:10.1097/00000421-199910000-00002
2. Iqbal J, Ginsburg O, Rochon PA, Sun P, Narod SA. Differences in breast cancer stage at diagnosis and cancer-specific survival by race and ethnicity in the United States [published correction appears in JAMA. 2015 Jun 9;313(22):2287]. JAMA. 2015;313(2):165-173. doi:10.1001/jama.2014.17322
3. Stapleton SM, Oseni TO, Bababekov YJ, Hung YC, Chang DC. Race/Ethnicity and Age Distribution of Breast Cancer Diagnosis in the United States. JAMA Surg. 2018;153(6):594-595. doi:10.1001/jamasurg.2018.0035
4. Sápi J, Kovács L, Drexler DA, Kocsis P, Gajári D, Sápi Z. Tumor Volume Estimation and Quasi-Continuous Administration for Most Effective Bevacizumab Therapy. PLoS One. 2015;10(11):e0142190. Published 2015 Nov 5. doi:10.1371/journal.pone.0142190