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Poster Pearl: Comparing the Efficiency of Stool-Based CRC Screening Tests

**Announcer:**
You're listening to *Clinician's Roundtable* on ReachMD, and this episode is sponsored by Exact Sciences. Here's your host, Dr. Matt Birnholz.

**Dr. Birnholz:**
Welcome to ReachMD. I'm Dr. Matt Birnholz.

Screening methods for colorectal cancer, or CRC, now include multi-target stool DNA, or mt-sDNA, tests. And these screening strategies become the focus of new research presented in a poster titled, *Efficient Frontier Strategies for Stool-Based Colorectal Cancer Screening Tests*.

Now as part of the study, researchers noted that The United States Preventative Services Task Force recommends average risk colorectal cancer screening beginning at the age of 45 years with multiple options. These include mt-sDNA at one or three-year intervals or FIT every year.

The efficient frontier is an established indicator for the benefit to burden ratio that can be modeled to compare colorectal cancer screening strategies.

The efficient frontier analysis uses life years gained as benefits, and the number of lifetime colonoscopies as the burden.

A screening strategy is ultimately efficient if no other strategy provides more life years gained with equal or lower number of colonoscopies.

A large prospective clinical trial directly compared next generation mt-sDNA Cologuard-Plus, with a commercial FIT.

And with the availability of new performance data, re-evaluation of the benefits and burdens associated with each of these tests becomes timely.

It was the study's objective to compare the efficiency of the next generation mt-sDNA and FIT colorectal cancer screening strategies across recommended intervals and age ranges using updated test performance data.

So let's turn to the methods for this analysis. Researchers utilized the validated CRC-AIM model, which is able to simulate a cohort of average risk individuals without diagnosed colorectal cancer at the age of 40, screened with mt-sDNA or FIT at 1, 2 or three-year intervals.

The modeled age ranges for screening started at ages 45, 50 or 55 and ultimately ended at 70, 75, 80 or 85 years of age.

Colorectal cancer screening sensitivity and specificity inputs for the next generation mt-sDNA and commercial FIT were obtained from the recent BLUE-C study, which is highlighted in Table 1.

And the performance of follow up colonoscopy was identical to that utilized by the United States Preventative Services Task Force.

Consistent with the modeling approach used, adherence to initial screening, as well as follow up colonoscopy after a positive screening test, was modeled at 100%.

Estimated outcomes were life years gained as well as quality adjusted life years gained compared with no screening and total lifetime

number of colonoscopies, all per 1000 individuals.

Efficient frontiers were developed for life years gained or the quality adjusted life years gained versus colonoscopies.

Comparatively, near efficient strategies were those within 3 days of life year gained per person of efficient frontier, per established standards.

When reviewing figure one, it's important to understand that in an efficient frontier analysis, efficient strategies are those that fall along the line.

Meanwhile those that are found to be near efficient fall within the grey bound. All other strategies that are not efficient are otherwise outside of these regions.

And as mentioned before, Table 1 highlights test performance inputs that were utilized within the validated CRC-AIM model.

These inputs are from the BLUE-C clinical trial, where the sensitivity and specificity were established for the next generation mt-sDNA test and compared to FIT.

As for the study results, all the screening strategies resulted in positive life years gained when compared with no screening at all.

The majority of efficient screening strategies were based on the mt-sDNA test and had a starting age of 45.

Triennial mt-sDNA between the ages 45 and 75 was the *only* efficient USPSTF-recommended stool-based screening strategy for both efficient frontiers, as highlighted in figure one.

For the quality adjusted life years gained versus colonoscopies, the USPSTF recommended strategy of annual mt-sDNA between ages 45 and 75 was also efficient.

Meanwhile, annual FIT between ages 45 and 75 was near-efficient, as highlighted in Figure 1B.

This authors report that this shift from not efficient in previous analysis to efficient in the current analysis for triennial mt-sDNA is because of the improved specificity of the next generation mt-sDNA test while maintaining high sensitivity for advanced adenomatous and cancerous lesions.

So from this analysis, researchers conclude that the next generation mt-sDNA test at a three-year interval has the best benefit to burden ratio of the modeled stool-based screening strategies because of pre cancer detection and high specificity performance characteristics.

**Announcer:**
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