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Frailty as a Predictor of Outcomes in Autologous Breast Reconstruction: A Comparative Analysis of mFI-5, RAI-A, and RAI-Rev

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BACKGROUND

- Frailty is emerging as an important predictor of surgical outcomes
- Utility in complex reconstructive procedures remains poorly understood
- Validated frailty indices:
 - 5-factor Modified Frailty Index (**mFI-5**)
 - Risk Analysis Index–Administrative (**RAI-A**)
 - Revised RAI (**RAI-Rev**)

OBJECTIVE

- Compare the predictive performance of three frailty indices for preoperative risk stratification in free flap autologous breast reconstruction

METHODS

- Patients undergoing free flap breast reconstruction between 2015 and 2022 were identified from the ACS-NSQIP database
- Frailty was measured using mFI-5, RAI-A, and RAI-Rev indices
- Outcomes of interest included 30-day mortality, complications, readmission, reoperation, length of stay, and disposition
- Predictive performance assessed via multivariable logistic regression and ROC analysis

RESULTS

Outcome	Best-Performing Index	aOR (Frail vs Non-Frail)	p-Value	Nagelkerke R ²
Major complications	mFI-5	1.67	<0.001	0.046
Minor complications	mFI-5	2.34	<0.001	0.072
Wound dehiscence	mFI-5	2.19	0.01	0.049
Superficial SSI	mFI-5	1.29	0.027	0.024
Deep SSI	RAI-A / RAI-Rev	5.77 / 5.78 (prefrail)	0.005	0.047
Readmission	mFI-5	1.22 (prefrail)	0.001	0.047
Reoperation	mFI-5	1.52	0.004	0.026

Outcome	mFI-5 AUC	RAI-A AUC	RAI-Rev AUC
Readmission	0.9056	<0.60	<0.60
Major complications	0.72	<0.60	<0.60
Minor complications	0.7	<0.60	<0.60
Wound dehiscence	0.68	<0.60	<0.60
SSI (superficial)	0.66	<0.60	<0.60
SSI (deep)	0.62	0.60	0.60

CONCLUSIONS

- Out of 9,276 patients identified and included in final analysis mFI-5 offered consistent predictive value across multiple outcomes in autologous breast reconstruction when compared with RAI-A and RAI-Rev
- mFI-5 demonstrated consistent predictive value across multiple clinical outcomes
- Supports integration into preoperative risk stratification protocols

CLINICAL RELEVANCE

- The integration of frailty assessment—particularly the mFI-5—should be incorporated into preoperative risk stratification protocols to enhance surgical planning and optimize patient outcomes in complex reconstructive breast procedures