



Preoperative Breast Imaging Before Gender-Affirming Chest Masculinization Surgery



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Introduction

- Patients undergoing chest masculinization surgery (CMS) are at risk for breast cancer
- Prior studies have evaluated postoperative histology and incidence of breast cancer in transgender men overall, but there is limited data on preoperative screening practices
- Decision-making process for preoperative breast imaging has yet to become nationally standardized
 - There are no screening guidelines to inform preoperative breast imaging pre-CMS
 - Prior to standardization, there was considerable inter-surgeon variability in work-up at this institution
- Detecting malignancy before CMS:
 - Alters surgical planning
 - Can prevent reoperation
- Lack of standardization in preoperative screening can lead to missed diagnoses

Objectives

- Characterize current preoperative breast cancer screening practices:** describe the frequency, indication, and modality of preoperative breast imaging before CMS at a large academic tertiary care center
- Describe outcome of preoperative breast imaging:** identify and describe the outcome of preoperative breast imaging for CMS, including BIRADS and indication for follow-up procedures (biopsy, additional imaging, etc.)
- Compare time to surgery with and without preoperative breast imaging:** evaluate the impact of preoperative breast imaging on surgical timing, given the distress that surgical delays could have on patients
- Assess prevalence of abnormal preoperative and postoperative findings:** describe preoperative detection and incidental postoperative detection of malignancy and benign breast disease on pathology
- Describe impact of preoperative vs. postoperative detection of breast cancer:** assess alteration to surgical planning following preoperative detection of malignancy and reoperation following postoperative detection
- Develop and implement a standardized decision-making algorithm:** utilize interdisciplinary collaboration between surgical oncology and plastic surgery to develop and implement a tool for standardized breast cancer screening before CMS

Methods

- Single-institution, retrospective review of adults who underwent CMS at a large, urban transgender health center
 - January 2017-September 2024
- Descriptive statistics: health histories, incidence and indication for imaging, imaging modality and outcomes, postoperative pathology, postop screening recommendations
 - Alterations to surgical course upon preop vs. postop detection of malignancy are described
- Unpaired *t* test used to compare time between preop appointment and surgery for patients who underwent preop breast imaging vs. those with no preop imaging
- An institution-wide preoperative breast cancer screening algorithm for patients undergoing gender-affirming CMS is described

Demographic Characteristics	Number	Percent (%)
Total cohort size	368	100
Female sex assigned at birth	368	100
<i>Gender Identity</i>		
Transgender man	264	71.7
Nonbinary	104	28.3
	Mean (range)	Standard Deviation
Age, years	27 (18-63)	8.0

Table 1. Patient Demographics
Characteristics at time of CMS, 338 patients (91.8%) were under 40 years old at the time of surgery. Mean follow-up was 19.8 months (IQR 2.5-20.2).

Preoperative Medical History	Number	Percent (%)
Personal history of malignancy	7	1.9
Prior chest surgery	12	3.3
Exogenous testosterone use	310	84.2
Hormonal contraceptive use	105	28.5
Previous gravidity or parity	6	1.6
Genetic testing performed	8	2.2
Family genetic testing performed	9	2.4
Family breast cancer history	117	31.8
Degree of relative with breast cancer		
1 st	21	17.9
2 nd	76	65.0
3 rd or 4 th	20	17.1

Table 2. Past Medical and Surgical History
Personal history of malignancy includes skin cancers, astrocytoma, CML, or thyroid cancers. Prior chest surgeries include biopsy, lumpectomy, or reduction. Average duration of T use was 2.2 years (IQR 0.9-2.9 years).

Breast imaging modality	Number	Percent (%)
Screening mammography	29	60.4
Diagnostic mammography	12	25.0
MRI	4	8.3
Ultrasound	3	6.3
Breast imaging indication		
Patient age	18	41.9
Family breast cancer history	13	30.2
Physical exam finding or patient concern	10	23.3
BRCA2 mutation	1	2.3

Table 3. Preoperative Breast Imaging Modality and Indication
Imaging was indicated in 11.7% (n=43) and performed in 11.1% (n=41), and 48 images occurred. For one patient who underwent preop screening mammography, indication was not listed.

Incidence of Perioperatively Diagnosis of Malignancy	
On preoperative breast imaging	2
On postoperative pathology only	1
Total	3 (0.8%)
Incidence of Benign Breast Disease Identified on Postoperative Pathology	
Ductal hyperplasia, ductal ectasia, apocrine metaplasia, hemangioma, micropapilloma, epidermoid cyst, or fibroadenoma	22 (6.0%)

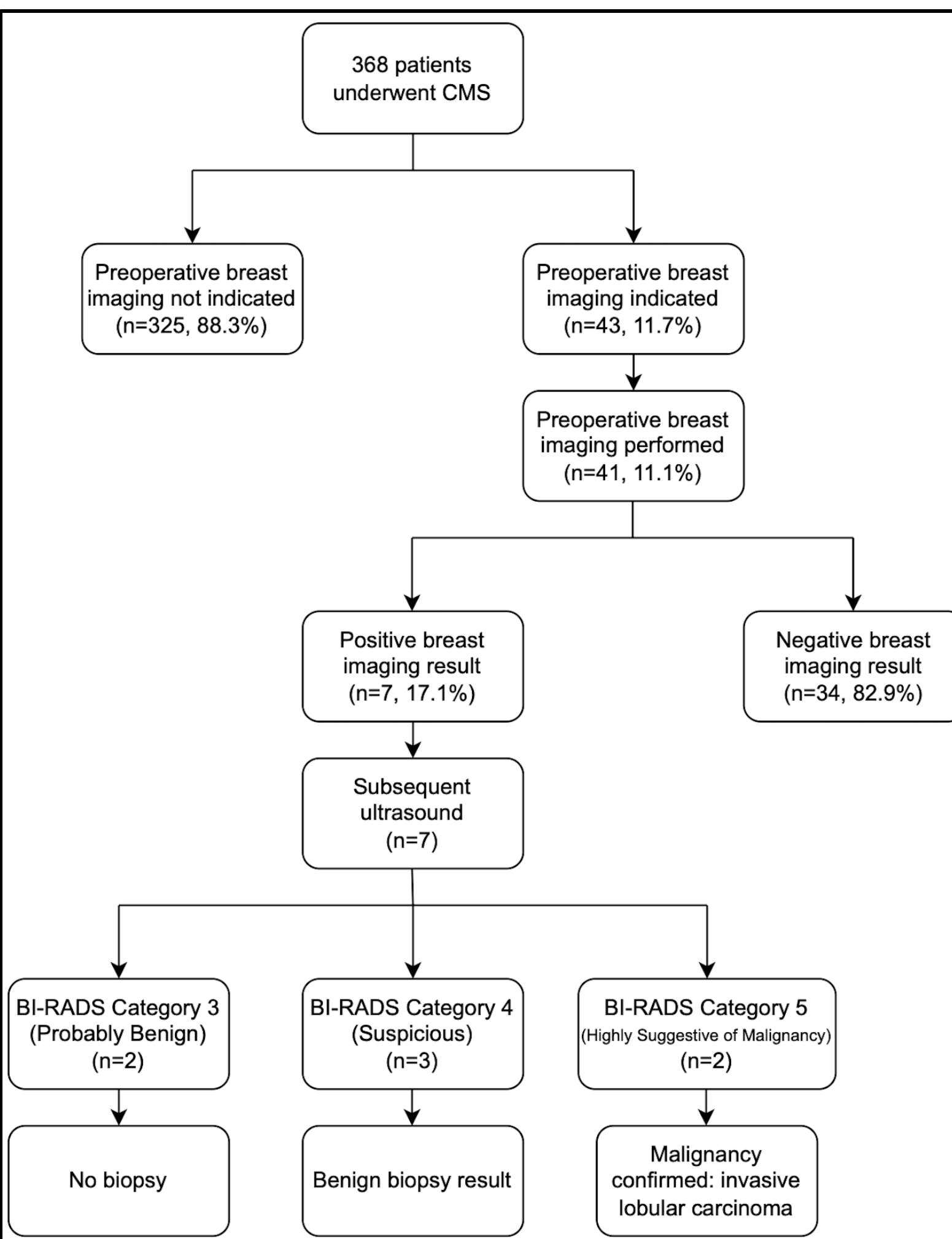


Figure 1. Flowchart of Preoperative Breast Imaging and Outcomes
Preoperative imaging was indicated for 43 patients (11.7%). Of those who received imaging, 17.1% (n=7) had a positive result, such as irregular breast mass. A biopsy was performed on those with BI-RADS Category 4 or 5 (n=5).

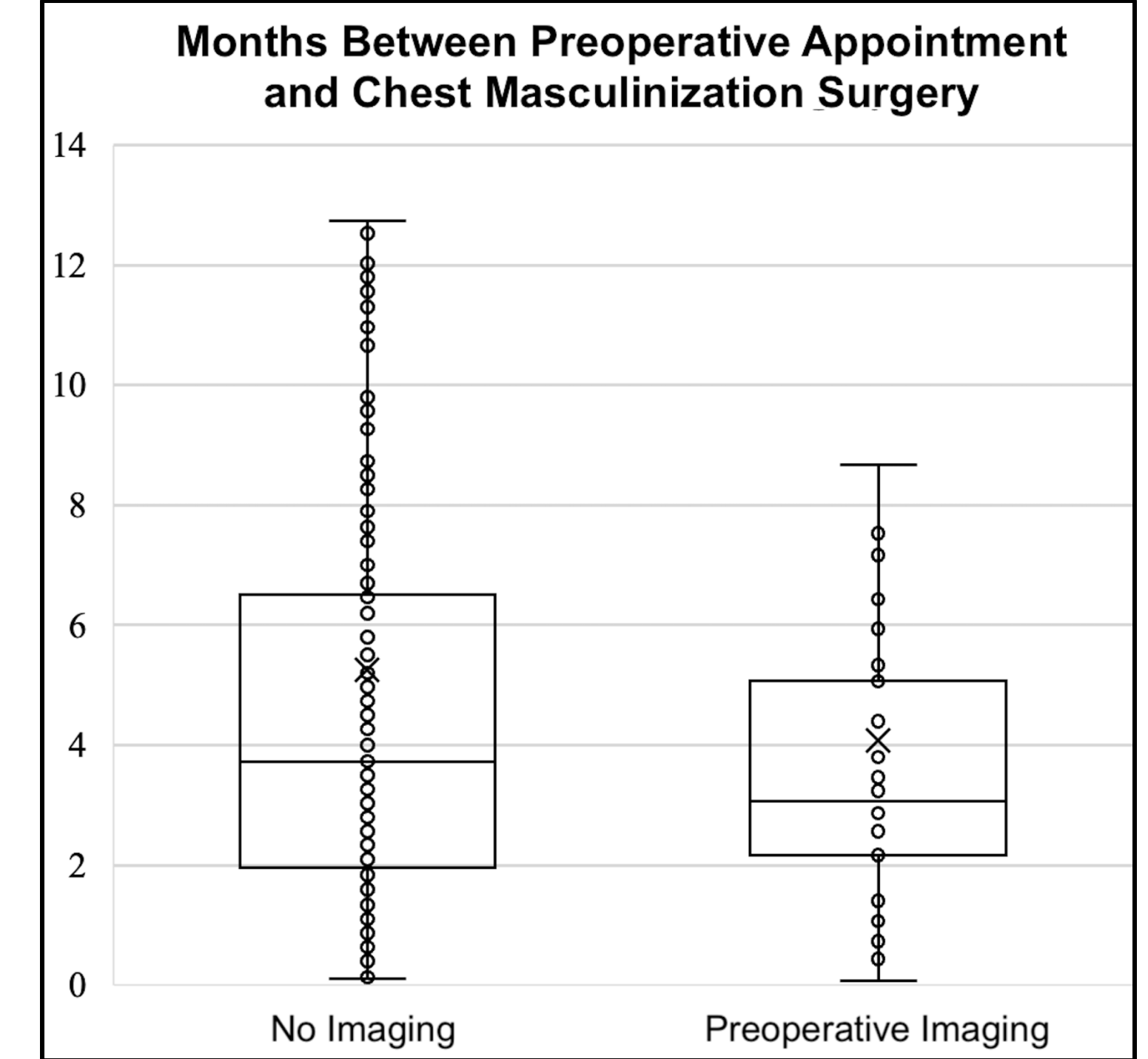


Figure 2. Time Between Preoperative Appointment and Surgery
A Box and Whisker Plot depicting time in months between preop appointment and CMS for those who did not (median 3.7 months, IQR 2.0-6.5) and did (median 3.1 months, IQR 2.2-5.1). There was no significant difference (p=0.2).

Results

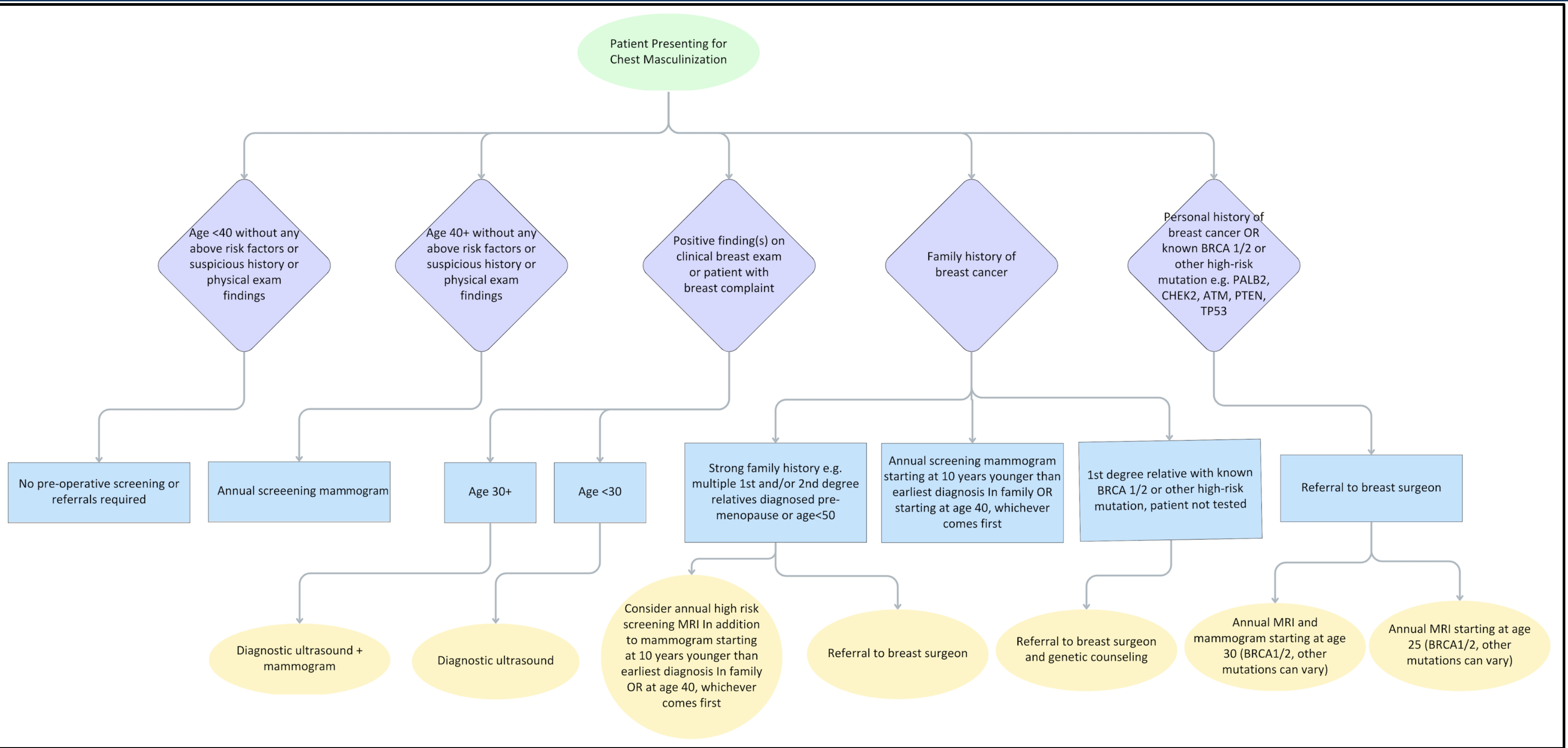


Figure 3. Preoperative Breast Cancer Screening Algorithm, to Guide Breast Imaging before Chest Masculinization Surgery

Discussion

- CMS differs from complete oncologic mastectomy
 - Residual tissue remains postop, nipple-areola complex [NAC] often spared, axillary lymph nodes remain intact
 - Procedural differences → implications for postoperative cancer screening → post-CMS TGNB patients at particular risk
- Screening was critical for early detection of malignancy in 2 patients → preoperative detection altered surgical planning, allowing for efficient and effective treatment → collaborative surgery was undertaken
 - Gender-affirming plastic surgeon marks patient for masculinizing scar contour and harvests nipple grafts, surgical oncologist performs mastectomy, then plastic surgeon closes the incisions, reconstructs NACs as needed, and replaces them as free nipple grafts
 - For malignancy, patients receive free nipple grafts pending potential NAC involvement of the lesion, potential viability of the grafts given blood supply of resulting skin flaps, and patient preference
- Cases where preoperative detection of malignancy occurred → breast cancer risk factors were notable
 - One was over 40, hormonal birth control use for 20+ years, gave birth to first child over 30; one was over 40, was nulliparous, used tobacco and had a family history of breast cancer in first-degree relative
 - Patient who was diagnosed on postop pathology (no preop breast imaging) had no breast cancer risk factors → after diagnosis, was referred to a breast oncologist, underwent subsequent oncologic surgery post-CMS
- Overall, 0.8% of cohort was perioperatively diagnosed with breast cancer → comparable to the age-adjusted risk for cisgender women (0.5% for 30-year-old women)

Conclusion

Preoperative breast imaging remains a unique challenge to transgender patients, making this algorithm a critical resource for gender-affirming surgeons. Most cisgender women undergoing mastectomy receive an oncologic mastectomy that removes more subcutaneous tissue than CMS, and most people undergoing reduction mammoplasty can continue to receive regular screening via mammography postoperatively. Patients who undergo CMS generally do not return for future breast cancer screening and are not able to receive mammograms. Detecting breast cancer preoperatively helps surgeons and patients avoid additional oncologic surgeries at a future date, as it allows gender-affirming surgeons and surgical oncologists to collaborate in advance of CMS to ensure that one surgery meets all necessary oncologic and gender-affirming goals.