Medical Policy

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Title: Reduction Mammaplasty for Breast-Related Symptoms

Professional / Institutional
Original Effective Date: January 20, 2017
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Populations	Interventions	Comparators	Outcomes
Individuals: • With symptomatic macromastia	Interventions of interest are: • Reduction mammaplasty	Comparators of interest are: • Nonsurgical treatment (e.g., analgesia, clothing modifications, physical therapy)	Relevant outcomes include: • Symptoms • Functional outcomes

DESCRIPTION

Macromastia, or gigantomastia, is a condition that describes breast hyperplasia or hypertrophy. Macromastia may result in clinical symptoms such as shoulder, neck, or back pain, or recurrent intertrigo in the mammary folds. In addition, macromastia may be associated with psychosocial or emotional disturbances related to the large breast size. Reduction mammaplasty is a surgical procedure designed to remove a variable proportion of breast tissue to address emotional and psychosocial issues and/or to relieve the associated clinical symptoms.

OBJECTIVE

The objective of this evidence review is to evaluate the clinical situations where the evidence demonstrates that reduction mammoplasty improved the net health outcome.

BACKGROUND

Macromastia

Macromastia, or gigantomastia, is a condition that describes breast hyperplasia or hypertrophy. Macromastia may result in clinical symptoms such as shoulder, neck, or back pain, or recurrent intertrigo in the mammary folds. Also, macromastia may be associated with psychosocial or emotional disturbances related to the large breast size.

Treatment

Reduction mammaplasty is a surgical procedure designed to remove a variable proportion of breast tissue to address emotional and psychosocial issues and/or to relieve the associated clinical symptoms.

While literature searches have identified many articles that discuss the surgical technique of reduction mammaplasty and have documented that reduction mammaplasty is associated with relief of physical and psychosocial symptoms,[1,2,3,4,5,6,7,8,9,] an important issue is whether reduction mammaplasty is a functional need or cosmetic. For some patients, the presence of medical indications is clear-cut: clear documentation of recurrent intertrigo or ulceration secondary to shoulder grooving. For some patients, the documentation differentiating between a cosmetic and a medically necessary procedure will be unclear. Criteria for medically necessary reduction mammaplasty are not well-addressed in the published medical literature.

Some protocols on the medical necessity of reduction mammaplasty are based on the weight of removed breast tissue. The basis of weight criteria is not related to the outcomes of surgery, but to surgeons retrospectively classifying cases as cosmetic or medically necessary. Schnur et al. (1991) at the request of third-party payers, developed a sliding scale.[10,] This scale was based on survey responses from 92 of 200 solicited plastic surgeons, who reported the height, weight, and amount of breast tissue removed from each breast from the last 15 to 20 reduction mammaplasties they had performed. Surgeons were also asked if the procedures were performed for cosmetic or medically necessary reasons. The data were then used to create a chart relating the body surface area, and the cutoff weight of breast tissue removed that differentiated cosmetic and medically necessary procedures. Based on their estimates, those with a breast tissue removed weight above the twenty-second percentile likely had the procedure for medical

reasons, while those below the fifth percentile likely had the procedure performed for cosmetic reasons; those falling between the cutpoints had the procedure performed for mixed reasons.

Schnur (1999) reviewed the use of the sliding scale as a coverage criterion and reported that, while many payers had adopted it, many had also misused it.[11,] Schnur pointed out that if a payer used weight of resected tissue as a coverage criterion, then if the weight fell below the fifth percentile, the reduction mammaplasty would be considered cosmetic; if above the twenty-second percentile, it would be considered medically necessary; and if between these cutpoints, it would be considered on a case-by-case basis. Schnur also questioned the frequent requirement that a woman is within 20% of her ideal body weight. While weight loss might relieve symptoms, durable weight loss is notoriously difficult and might be unrealistic in many cases.

REGULATORY STATUS

Reduction mammaplasty is a surgical procedure and, as such, is not subject to regulation by the U.S. Food and Drug Administration.

POLICY

A. Reduction mammaplasty may be considered **medically necessary** for the treatment of macromastia in individuals at least 18 years of age or for whom growth is complete (i.e., height, weight, and breast size stable for over 12 months) when the amount of breast tissue (not fatty tissue) resected is at least 1000 g per breast and photographs are provided for visual documentation of breast hypertrophy.

B. Reduction mammaplasty may be considered **medically necessary** for the treatment of macromastia in individuals at least 18 years of age or for whom growth is complete (i.e., height, weight, and breast size stable for over 12 months) when well-documented clinical symptoms are present, including, but not limited to:

1. Documentation of:
    a. A minimum 6-week history of shoulder, neck or back pain related to macromastia that is not responsive to conservative therapy, such as an appropriate support bra, exercises, heat/cold treatment and appropriate nonsteroidal anti-inflammatory agents/muscle relaxants;
    OR
    b. Recurrent or chronic intertrigo between the pendulous breast and the chest wall with skin breakdown that is refractory to standard treatment options;
    AND
2. **ALL** of the following objective criteria:
    a. Photographs, providing a visual documentation of breast size, or documenting the presence of shoulder grooving (an indication that the breast weight results in grooving of the bra straps on the shoulder), or documenting the presence of intertrigo with skin breakdown.
    b. The amount of breast tissue (not fatty tissue) resected per breast would be at or above 22% using the Schnur Sliding Scale (see Appendix), which suggests a minimum amount of breast tissue (not fatty tissue) to be removed for the procedure to be considered medically necessary, based on the patient's body surface area.

C. Reduction mammaplasty is considered **non-covered** for all other indications not meeting the above criteria.

D. Liposuction-only reduction mammaplasty is considered **experimental / investigational** because of insufficient evidence of its effectiveness.

POLICY GUIDELINES

A. Lipoaspirate will not be counted toward volume of breast tissue removed.

B. Medical records from the primary care physician who has diagnosed or treated the symptoms prompting this request may also be required.

C. If amount of breast tissue (not fatty tissue) actually resected is less than 22% based on the Schnur Sliding Scale, medical necessity will be reviewed on a case by case basis.

Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

RATIONALE

This evidence review was created searches of the PubMed database. The most recent literature review was performed through December 20, 2024.

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function, including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent 1 or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. Randomized controlled trials are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Promotion of greater diversity and inclusion in clinical research of historically marginalized groups (e.g., People of Color [African-American, Asian, Black, Latino and Native American]; LGBTQIA (Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual); Women; and People with Disabilities [Physical and Invisible]) allows policy populations to be more reflective of and findings more applicable to our diverse members. While we also strive to use inclusive language related to these groups in our policies, use of gender-specific nouns (e.g., women, men, sisters, etc.) will continue when reflective of language used in publications describing study populations.

Reduction Mammaplasty for Macromastia-Efficacy in Reducing Symptoms

Clinical Context and Therapy Purpose

The purpose of reduction mammaplasty is to provide a treatment option that is an alternative to or an improvement on existing therapies, such as nonsurgical treatment, in individuals with symptomatic macromastia.

The following PICO was used to select literature to inform this review.

Populations
The relevant population of interest is individuals with symptomatic macromastia, or gigantomastia, a condition that describes breast hyperplasia or hypertrophy.

Interventions
The therapy being considered is reduction mammaplasty, a surgical procedure that removes a variable proportion of breast tissue to relieve the associated clinical symptoms and address emotional and psychosocial issues related to large breast size.

Comparators
Comparators of interest include nonsurgical treatment which primarily involves analgesia, clothing modifications, physical therapy and other measures to address symptoms.

Outcomes
The general outcomes of interest are symptoms and functional outcomes. Symptoms of symptomatic macromastia can include mastalgia, pain in the shoulders, back, and neck, or recurrent intertrigo in the mammary fold. The condition may also be associated with psychosocial or emotional disturbances.

Study Selection Criteria
Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess longer term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- Studies with duplicative or overlapping populations were excluded.

REVIEW OF EVIDENCE

Systematic Reviews
Lin et al (2021) conducted a systematic review of 7 RCTs (N=285) comparing reduction mammaplasty with a control intervention (nonoperation or physiotherapy exercises) for the treatment of breast hypertrophy.[12,] Four RCTs were included in meta-analyses reporting on change in pain, physical function, and psychological function after interventions. Statistically significant improvements were found in pain (standardized mean difference [SMD], -1.29; 95% confidence interval [CI], -1.63 to -0.96; p<.00001), physical function (SMD, 0.97; 95% CI, 0.69 to 1.25; p<.00001), and psychological function (SMD, -0.79; 95% CI, -1.07 to -0.52; p<.00001) after mammaplasty compared to the control intervention. The authors concluded that mammaplasty had a positive and significant effect on health-related quality of life, including pain, physical, and psychological functioning, in individuals with breast hypertrophy.

Table 1. RCTs Included in SR & M-A

Trial	Lin et al (2021)[12,]
Beraldo et al (2016)[13,a]	●
Iwuaguwu et al (2006)[6,]	●
Iwuaguwu et al (2006)[14,a]	●
Freire et al (2007)[15,a]	●
Saariniemi et al (2008)[9,]	●
Saariniemi et al (2009)[16,]	●
Sabino Neto et al (2008)[7,a]	●

MA: meta-analyses; RCTs: randomized controlled trials; SR: systematic reviews.
[a] Included in M-A.

Table 2. SR & M-A Characteristics

Study	Dates	Trials	Participants	N (Range)	Design	Duration
Lin et al (2021)[12,]	2006-2016	7[a]	Individuals with breast hypertrophy (mean age, 32 to 46.4 years) receiving either reduction mammaplasty or control intervention (nonoperation or physiotherapy exercises, concentrating mostly on the upper body)	285 (56 to 92)	RCT	4 to 7.8 months

MA: meta-analyses; RCTs: randomized controlled trials; SR: systematic reviews.
[a] Only 4 included in M-A.

Table 3. SR & M-A Results

Study	Change in Pain from Baseline	Improvement in Physical Function from Baseline	Change in Psychological Function from Baseline
Lin et al (2021)[12,]			
Total N	165 (2 studies)	221 (3 studies)	221 (3 studies)
SMD (95% CI)	-1.29 (-1.63 to -0.96)	0.97 (0.69 to 1.25)	-0.79 (-1.07 to -0.52)
p-value	<.00001	<.00001	<.00001
I^2 (p)	34% (.22)	42% (.18)	0% (.59)

CI: confidence interval; MA: meta-analyses; SMD: standardized mean difference; SR: systematic reviews.]

Observational Studies

Singh and Losken (2012) reported on a systematic review of studies reporting outcomes after reduction mammaplasty.[17,] In 7 studies reporting on physical symptoms (n range, 11 to 92 patients), reviewers found reduction mammaplasty improved functional outcomes including pain, breathing, sleep, and headaches. Additional psychological outcomes noted included improvements in self-esteem, sexual function, and quality of life. Torresetti et al (2022) conducted another systematic review to examine the potential association between bilateral breast reduction and improvement in lung function in women with macromastia.[18,] The review included 15 studies published from 1974 to 2018 (n range, 1 to 50 patients). The findings showed that reduction mammaplasty can lead to changes in objective respiratory parameters, such as spirometric tests or arterial blood gas measurements, but the clinical significance of these changes was unclear.

Hernanz et al. (2016) reported on a descriptive cohort study of 37 consecutive obese patients who underwent reduction mammoplasty for symptomatic macromastia, along with 37 age-matched women hospitalized for short-stay surgical procedures.[19,] In the preoperative state, SF-36 physical health component subscore was significantly lower for patients with symptomatic macromastia (40) than for age-matched controls (53; $p<.001$), with differences in 5 of the 8 subscales. At 18 months postprocedure, there were no significant differences in any SF-36 subscores except the body pain subscale between patients who had undergone reduction mammoplasty and age-matched controls.

Kerrigan et al. (2002) published the results of the BRAVO (Breast Reduction: Assessment of Value and Outcomes) study, a registry of 179 women undergoing reduction mammaplasty.[20,] Women were asked to complete quality of life questionnaires and a physical symptom count both before and after surgery. The physical symptom count focused on the number of symptoms present that were specific to breast hypertrophy and included upper back pain, rashes, bra strap grooves, neck pain, shoulder pain, numbness, and arm pain. Also, the weight and volume of resected tissue were recorded. Results were compared with a control group of patients with breast hypertrophy, defined as size DD bra cup, and normal-sized breasts, who were recruited from the general population. The authors proposed that the presence of 2 physical symptoms might be an appropriate cutoff for determining medical necessity for breast reduction. For example, while 71.6% of the hypertrophic controls reported none or 1 symptom, only 12.4% of those considered surgical candidates reported none or 1 symptom. This observation is difficult to evaluate because the study did not report how surgical candidacy was determined. The authors also reported that none of the traditional criteria for determining medical necessity for breast reduction surgery (height, weight, body mass index, bra cup size, or weight of resected breast tissue) had a statistically significant relation with outcome improvement. The authors concluded that the determination of medical necessity should be based on patients' self-reported symptoms rather than more objectively measured criteria (eg, the weight of excised breast tissue).

Adverse Events

Thibaudeau et al. (2010) conducted a systematic review to evaluate breastfeeding after reduction mammaplasty.[21,] After a review of literature from 1950 through 2008, reviewers concluded that reduction mammaplasty does not reduce the ability to breastfeed. In women who had reduction

mammaplasty, breastfeeding rates were comparable in the first month postpartum to rates in the general population in North America.

Chen et al. (2011) reported on a review of claims data to compare complication rates after breast surgery in 2,403 obese and 5,597 nonobese patients.[22,] Of these patients, breast reduction was performed in 1939 (80.7%) in the study group and 3569 (63.8%) in the control group. Obese patients had significantly more claims for complications within 30 days after breast reduction surgery (14.6%) than nonobese patients (1.7%; p<.001). Complications included inflammation, infection, pain, and seroma/hematoma development. Shermak et al. (2011) also reported on a review of claims data comparing complication rates by age after breast reduction surgery in 1192 patients.[23,] Infection occurred more frequently in patients older than 50 years of age (odds ratio, 2.7; p=.003). Additionally, women older than 50 years experienced more wound healing problems (odds ratio, 1.6; p=.09) and reoperative wound debridement (odds ratio, 5.1; p=.07). Other retrospective evaluations (2013, 2014) of large population datasets have reported increased incidences of perioperative and postoperative complications with high body mass index.[24,25,]

Section Summary: Reduction Mammaplasty for Macromastia-Efficacy in Reducing Symptoms
Systematic reviews of RCTs and observational studies have shown that several measures of function and quality of life improve after reduction mammaplasty.

SUPPLEMENTAL INFORMATION
The purpose of the following information is to provide reference material. Inclusion does not imply endorsement or alignment with the evidence review conclusions.

Practice Guidelines and Position Statements
Guidelines or position statements will be considered for inclusion in 'Supplemental Information if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

American Society of Plastic Surgeons
In 2011, the American Society of Plastic Surgeons (ASPS) issued practice guidelines and a companion document on criteria for third-party payers for reduction mammaplasty, which was updated and reaffirmed in March 2021 and March 2022.[26,27,] Based on high quality evidence, the ASPS strongly recommends that "postmenarche female patients presenting with breast hypertrophy should be offered reduction mammaplasty surgery as first-line therapy over nonoperative therapy based solely on the presence of multiple symptoms rather than resection weight." The guideline goes on to state that "reduction mammaplasty surgery is considered standard of care for symptomatic breast hypertrophy." The companion document notes that medical records should document the symptoms associated with the hypertrophy the patient has experienced, and lists the following:

- "Documentation may include pain that patient experiences in the neck, back, or breasts related to movement
- Difficulties in daily activities such as grocery shopping, banking, using transportation, preparing meals, feeding, showering, etc

- Documentation of any secondary complications or infections that may have occurred as a result of hypertrophy or macromastia including intertrigo, chronic rash, cervicalgia, dorsalgia, or kyphosis
- Documentation of prior procedures or therapies may be included but not required for approval
- Photographs demonstrating the patient's breast appearance, possible shoulder grooves and kyphosis can be included in the medical documentation
- Significant scientific evidence supports non-operative therapies should not be required prior to approval of the procedure."

U.S. Preventive Services Task Force Recommendations
Not applicable.

Ongoing and Unpublished Clinical Trials
Some currently unpublished trials that might influence this review are listed in Table 4.

Table 4. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
Ongoing			
NCT04889469	Indications for Breast Reduction in the Public Health Care System	2000	Aug 2031

NCT: national clinical trial.

CODING

The following codes for treatment and procedures applicable to this policy are included below for informational purposes. This may not be a comprehensive list of procedure codes applicable to this policy.

Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

The code(s) listed below are medically necessary ONLY if the procedure is performed according to the "Policy" section of this document.

CPT/HCPCS	
19318	Reduction mammaplasty

REVISIONS	
01-20-2017	Policy added to the bcbsks.com web site on 12-21-2016 with an effective date of 01-20-2017.
03-29-2017	Updated Description section.
	Updated Rationale section.
	Updated References section.
03-28-2018	Updated Description section.
	Updated Rationale section.
	Updated References section.
03-27-2019	Updated Description section.
	Updated Rationale section.
	Updated References section.
04-16-2021	Updated Description section.
	Updated Rationale section.
	Updated References section.
05-14-2021	Formatting changes made to Appendix Table 1
10-08-2021	Updated Description section.
	In Policy section Reformatted to increase clarity for B1 and B2
	Updated Rationale section.
	Updated Rationale section.
04-08-2022	Updated Description Section
	Updated Rationale Section
	Updated Coding Section ▪ Converted ICD-10 codes to ranges
	Updated References Section
03-28-2023	Updated Description Section
	Updated Rationale Section
	Updated Coding Section ▪ Removed ICD-10 Codes
	Updated References Section
03-26-2024	Updated Description section.

REVISIONS	
	Updated Rationale section.
	Updated References section.
03-27-2025	Updated Description Section
	Updated Rationale Section
	Updated Reference Section

REFERENCES

1. Dabbah A, Lehman JA, Parker MG, et al. Reduction mammaplasty: an outcome analysis. Ann Plast Surg. Oct 1995; 35(4): 337-41. PMID 8585673
2. Schnur PL, Schnur DP, Petty PM, et al. Reduction mammaplasty: an outcome study. Plast Reconstr Surg. Sep 1997; 100(4): 875-83. PMID 9290655
3. Hidalgo DA, Elliot LF, Palumbo S, et al. Current trends in breast reduction. Plast Reconstr Surg. Sep 1999; 104(3): 806-15; quiz 816; discussion 817-8. PMID 10456536
4. Glatt BS, Sarwer DB, O'Hara DE, et al. A retrospective study of changes in physical symptoms and body image after reduction mammaplasty. Plast Reconstr Surg. Jan 1999; 103(1): 76-82; discussion 83-5. PMID 9915166
5. Collins ED, Kerrigan CL, Kim M, et al. The effectiveness of surgical and nonsurgical interventions in relieving the symptoms of macromastia. Plast Reconstr Surg. Apr 15 2002; 109(5): 1556-66. PMID 11932597
6. Iwuagwu OC, Walker LG, Stanley PW, et al. Randomized clinical trial examining psychosocial and quality of life benefits of bilateral breast reduction surgery. Br J Surg. Mar 2006; 93(3): 291-4. PMID 16363021
7. Sabino Neto M, Demattê MF, Freire M, et al. Self-esteem and functional capacity outcomes following reduction mammaplasty. Aesthet Surg J. 2008; 28(4): 417-20. PMID 19083555
8. Iwuagwu OC, Platt AJ, Stanley PW, et al. Does reduction mammaplasty improve lung function test in women with macromastia? Results of a randomized controlled trial. Plast Reconstr Surg. Jul 2006; 118(1): 1-6; discussion 7. PMID 16816661
9. Saariniemi KM, Keranen UH, Salminen-Peltola PK, et al. Reduction mammaplasty is effective treatment according to two quality of life instruments. A prospective randomised clinical trial. J Plast Reconstr Aesthet Surg. Dec 2008; 61(12): 1472-8. PMID 17983882
10. Schnur PL, Hoehn JG, Ilstrup DM, et al. Reduction mammaplasty: cosmetic or reconstructive procedure?. Ann Plast Surg. Sep 1991; 27(3): 232-7. PMID 1952749
11. Schnur PL. Reduction mammaplasty-the schnur sliding scale revisited. Ann Plast Surg. Jan 1999; 42(1): 107-8. PMID 9972729
12. Lin Y, Yang Y, Zhang X, et al. Postoperative Health-related Quality of Life in Reduction Mammaplasty: A Systematic Review and Meta-Analysis. Ann Plast Surg. Jul 01 2021; 87(1): 107-112. PMID 33346564
13. Beraldo FN, Veiga DF, Veiga-Filho J, et al. Sexual Function and Depression Outcomes Among Breast Hypertrophy Patients Undergoing Reduction Mammaplasty: A Randomized Controlled Trial. Ann Plast Surg. Apr 2016; 76(4): 379-82. PMID 25536204
14. Iwuagwu OC, Stanley PW, Platt AJ, et al. Effects of bilateral breast reduction on anxiety and depression: results of a prospective randomised trial. Scand J Plast Reconstr Surg Hand Surg. 2006; 40(1): 19-23. PMID 16428209

15. Freire M, Neto MS, Garcia EB, et al. Functional capacity and postural pain outcomes after reduction mammaplasty. Plast Reconstr Surg. Apr 01 2007; 119(4): 1149-1156. PMID 17496584
16. Saariniemi KM, Joukamaa M, Raitasalo R, et al. Breast reduction alleviates depression and anxiety and restores self-esteem: a prospective randomised clinical trial. Scand J Plast Reconstr Surg Hand Surg. 2009; 43(6): 320-4. PMID 19995250
17. Singh KA, Losken A. Additional benefits of reduction mammaplasty: a systematic review of the literature. Plast Reconstr Surg. Mar 2012; 129(3): 562-570. PMID 22090252
18. Torresetti M, Zuccatosta L, Di Benedetto G. The effects of breast reduction on pulmonary functions: A systematic review. J Plast Reconstr Aesthet Surg. Dec 2022; 75(12): 4335-4346. PMID 36229312
19. Hernanz F, Fidalgo M, Muñoz P, et al. Impact of reduction mammoplasty on the quality of life of obese patients suffering from symptomatic macromastia: A descriptive cohort study. J Plast Reconstr Aesthet Surg. Aug 2016; 69(8): e168-73. PMID 27344408
20. Kerrigan CL, Collins ED, Kim HM, et al. Reduction mammaplasty: defining medical necessity. Med Decis Making. 2002; 22(3): 208-17. PMID 12058778
21. Thibaudeau S, Sinno H, Williams B. The effects of breast reduction on successful breastfeeding: a systematic review. J Plast Reconstr Aesthet Surg. Oct 2010; 63(10): 1688-93. PMID 19692299
22. Chen CL, Shore AD, Johns R, et al. The impact of obesity on breast surgery complications. Plast Reconstr Surg. Nov 2011; 128(5): 395e-402e. PMID 21666541
23. Shermak MA, Chang D, Buretta K, et al. Increasing age impairs outcomes in breast reduction surgery. Plast Reconstr Surg. Dec 2011; 128(6): 1182-1187. PMID 22094737
24. Gust MJ, Smetona JT, Persing JS, et al. The impact of body mass index on reduction mammaplasty: a multicenter analysis of 2492 patients. Aesthet Surg J. Nov 01 2013; 33(8): 1140-7. PMID 24214951
25. Nelson JA, Fischer JP, Chung CU, et al. Obesity and early complications following reduction mammaplasty: an analysis of 4545 patients from the 2005-2011 NSQIP datasets. J Plast Surg Hand Surg. Oct 2014; 48(5): 334-9. PMID 24506446
26. American Society of Plastic Surgeons. Reduction Mammaplasty: ASPS Recommended Insurance Coverage Criteria for Third-Party Payers. 2021; https://www.plasticsurgery.org/documents/Health-Policy/Reimbursement/insurance-2021-reduction-mammaplasty.pdf. Accessed December 20, 2024.
27. Perdikis G, Dillingham C, Boukovalas S, et al. American Society of Plastic Surgeons Evidence-Based Clinical Practice Guideline Revision: Reduction Mammaplasty. Plast Reconstr Surg. Mar 01 2022; 149(3): 392e-409e. PMID 35006204

OTHER REFERENCES

1. Blue Cross and Blue Shield Surgery Liaison Committee, Consent Ballot, September 2016.
2. Blue Cross and Blue Shield Surgery Liaision Committee, August 2007, May 2017.

APPENDIX

Appendix Table 1. Schnur Sliding Scale

Body Surface Area, m^2	22% (g)	Body Surface Area, m^2	22% (g)	Body Surface Area, m^2	22% (g)	Body Surface Area, m^2	22% (g)
1.35	199	1.72	384	2.09	737	2.46	1419
1.36	203	1.73	390	2.10	750	2.47	1445
1.37	207	1.74	397	2.11	764	2.48	1470
1.38	210	1.75	404	2.12	778	2.49	1496
1.39	214	1.76	411	2.13	791	2.50	1522
1.40	218	1.77	419	2.14	805	2.51	1550
1.41	222	1.78	426	2.15	819	2.52	1578
1.42	226	1.79	434	2.16	834	2.53	1606
1.43	230	1.80	441	2.17	849	2.54	1634
1.44	234	1.81	449	2.18	865	2.55	1662
1.45	238	1.82	457	2.19	880	2.56	1690
1.46	242	1.83	466	2.20	895	2.57	1718
1.47	247	1.84	474	2.21	912	2.58	1746
1.48	251	1.85	482	2.22	928	2.59	1774
1.49	256	1.86	491	2.23	945	2.60	1802
1.50	260	1.87	500	2.24	961	2.61	1830
1.51	265	1.88	509	2.25	978	2.62	1858
1.52	270	1.89	518	2.26	996	2.63	1886
1.53	274	1.90	527	2.27	1014	2.64	1914
1.54	279	1.91	537	2.28	1032	2.65	1942
1.55	284	1.92	546	2.29	1050	2.66	1970
1.56	289	1.93	556	2.30	1068	2.67	1998
1.57	294	1.94	565	2.31	1088	2.68	2026
1.58	300	1.95	575	2.32	1108	2.69	2054
1.59	305	1.96	586	2.33	1127	2.70	2082
1.60	310	1.97	596	2.34	1147	Calculation of body surface area: Body surface area = the square root of height (cm) × weight (kg) / 3600	
1.61	316	1.98	607	2.35	1167		
1.62	321	1.99	617	2.36	1189		
1.63	327	2.00	628	2.37	1210		
1.64	332	2.01	640	2.38	1232		
1.65	338	2.02	652	2.39	1253		
1.66	344	2.03	663	2.40	1275		
1.67	351	2.04	675	2.41	1299		
1.68	357	2.05	687	2.42	1322		
1.69	364	2.06	700	2.43	1346		
1.70	370	2.07	712	2.44	1369		
1.71	377	2.08	725	2.45	1,393		