# Medical Policy

BlueCross BlueShield Kansas
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## Title: Reduction Mammaplasty for Breast-Related Symptoms

**Prior Authorization of Services may be required by Member's Contract.**

| **Professional / Institutional** |
|---|
| Original Effective Date: January 20, 2017 |
| Latest Review Date: March 28, 2023 |
| Current Effective Date: January 20, 2017 |

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**If your patient is covered under a different Blue Cross and Blue Shield plan, please refer to the Medical Policies of that plan.**

| Populations | Interventions | Comparators | Outcomes |
|---|---|---|---|
| Individuals:<br>• With symptomatic macromastia | Interventions of interest are:<br>• Reduction mammaplasty | Comparators of interest are:<br>• Nonsurgical treatment (e.g., analgesia, clothing modifications, physical therapy) | Relevant outcomes include:<br>• Symptoms<br>• 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 22nd percentile likely had the procedure for medical reasons,

while those below the 5th 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 5th percentile, the reduction mammaplasty would be considered cosmetic; if above the 22nd 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 has been updated regularly with searches of the PubMed database. The most recent literature review was performed through December 13, 2022.

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 patients 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**

**Randomized Controlled Trials**
Sabino Neto et al (2008) assessed functional capacity for 100 patients, ages 18 to 55 years, who were randomized to reduction mammaplasty or to waiting list control.[7,] Forty-six patients from each group completed the study. At baseline and 6 months later, patients were assessed for functional capacity using the Roland-Morris Disability Questionnaire (0=best performance, 24=worst performance) and for pain using a visual analog scale. The reduction mammaplasty group showed improvement in functional status, with an average score of 5.9 preoperatively and 1.2 within 6 months postoperatively ($p<.001$ for pre-post comparison within the mammaplasty group) versus an unchanged average score of 6.2 in the control group on the first and second evaluations. Additionally, pain in the lower back decreased on the visual analog scale from an average of 5.7 preoperatively to 1.3 postoperatively ($p<.001$ for pre-post comparison within the mammaplasty group) versus visual analog scale average scores in the control group of 6.0 and 5.3 on the first and second evaluations, respectively (p=not significant).

Saariniemi et al (2008) reported on the quality of life and pain in 82 patients randomized to reduction mammaplasty or a nonoperative group and evaluated at baseline and 6 months later.[9,]The authors reported that the mammaplasty group had significant improvements in quality

of life from baseline to 6 months, as measured by the Physical Component Summary score of the 36-Item Short-Form Health Survey (SF-36; change, +9.7 versus +0.7, p<.001), the Utility Index score (SF-6D; change, +17.5 versus +0.6), the index score of quality of life (SF-15D; change, +8.6 versus +0.06, p<.001), and SF-36 Mental Component Summary score (change, +7.8 versus -1.0, p<.002). There were also improvements in breast-related symptoms from baseline to 6 months, as measured by Finnish Breast-Associated Symptoms questionnaire scores (-47.9 versus -3.5, p<.001), and Finnish Pain Questionnaire scores (-21.5 versus -1.0, p<.001).

Iwuagwu et al (2006) reported on 73 patients randomized to reduction mammaplasty within 6 weeks or after a 6-month waiting period to assess lung function.[8,] All patients had symptoms related to macromastia. Postoperative lung function correlated with the weight of breast tissue removed, but there were no significant improvements in any lung function parameters for the mammaplasty group compared with the control group.

Key trials are reported in Tables 1 and 2 below.

**Table 1. Summary of Key Randomized Controlled Trial Characteristics**

| Study; Trial | Countries | Sites | Dates | Participants | Interventions | |
|---|---|---|---|---|---|---|
| | | | | | ***Active*** | ***Comparator*** |
| Sabino Neto (2008)[7,] | Brazil | 1 | 2002-2004 | Female patients (age 18 to 55 yrs) with breast hypertrophy (n=100) | Reduction mammaplasty (n=50) | Waiting list control (n=50) |
| Saariniemi (2008)[9,] | Finland | 1 | NR | Female patients with symptomatic breast hypertrophy (n=82) | Reduction mammaplasty (n=40) | Non-operative control (n=42) |

NR: not reported; RCT: randomized controlled trial.

**Table 2. Summary of Key Randomized Controlled Trial Results**

| Study | Change (Pre- to Postoperative) in RSES | Change (Pre- to Postoperative) in RMDQ | Change (Pre- to Postoperative) in VAS | Change (Pre- to Postoperative) in SF-36 Utility Index Score | Change (Pre- to Postoperative) in Mental Summary Score | Change (Pre- to Postoperative) in Pain Score |
|---|---|---|---|---|---|---|
| Sabino Neto (2008)[7,] | | | | | | |
| Mammaplasty | 8.9 to 4.9 (p<.001) | 5.9 to 1.2 (p<.001) | 5.7 to 1.3 (p<.001) | | | |
| Control | 9.1 to 9.0 (p>.999) | 6.2 to 6.2 (NR) | 6.0 to 5.3 (p<.001) | | | |

| Study | Change (Pre- to Postoperative) in RSES | Change (Pre- to Postoperative) in RMDQ | Change (Pre- to Postoperative) in VAS | Change (Pre- to Postoperative) in SF-36 Utility Index Score | Change (Pre- to Postoperative) in Mental Summary Score | Change (Pre- to Postoperative) in Pain Score |
|---|---|---|---|---|---|---|
| Saariniemi (2008)[9,] | | | | | | |
| Mammaplasty | | | | 0.645 to 0.820 | 46.0 to 53.8 | 28.5 to 7.0 |
| Control | | | | 0.657 to 0.663 | 47.2 to 46.2 | 27.5 to 26.5 |
| P-value | | | | <.001 | <.002 | <.001 |

NR: not reported; RSES: Rosenberg Self-Esteem Scale; RMDQ: Roland-Morris Disability Questionnaire; SF-36: 36-Item Short-Form Health Survey; VAS: visual analog scale.

The purpose of the gaps tables (Table 3 and 4) is to display notable gaps identified in each study. This information is synthesized as a summary of the body of evidence following each table and provides the conclusions on the sufficiency of evidence supporting the position statement.

**Table 3. Study Relevance Limitations**

| Study | Population[a] | Intervention[b] | Comparator[c] | Outcomes[d] | Duration of Follow-up[e] |
|---|---|---|---|---|---|
| Sabino Neto (2008)[7,] | | | 3. Comparator group on waiting list without additional intervention described | 5. Clinical significant difference not prespecified | |
| Saariniemi (2008)[9,] | | | 3. Comparator group did not receive surgery and had no other intervention described | 5. Clinical significant difference not prespecified | |

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.
[a] Population key: 1. Intended use population unclear; 2. Clinical context is unclear; 3. Study population is unclear; 4. Study population not representative of intended use.
[b] Intervention key: 1. Not clearly defined; 2. Version used unclear; 3. Delivery not similar intensity as comparator; 4.Not the intervention of interest.
[c] Comparator key: 1. Not clearly defined; 2. Not standard or optimal; 3. Delivery not similar intensity as intervention; 4. Not delivered effectively.
[d] Outcomes key: 1. Key health outcomes not addressed; 2. Physiologic measures, not validated surrogates; 3. No CONSORT reporting of harms; 4. Not established and validated measurements; 5. Clinical significant difference not prespecified; 6. Clinical significant difference not supported.
[e] Follow-Up key: 1. Not sufficient duration for benefit; 2. Not sufficient duration for harms.

**Table 4. Study Design and Conduct Limitations**

| Study | Allocation[a] | Blinding[b] | Selective Reporting[c] | Follow-Up[d] | Power[e] | Statistical[f] |
|---|---|---|---|---|---|---|
| Sabino Neto (2008)[7,] | | 1,2,3. No blinding | | | | 3. Some p-values not reported |
| Saariniemi (2008)[9,] | | 1,2,3. No blinding | | 1. 22% of patients lost to follow-up | | |

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.
a Allocation key: 1. Participants not randomly allocated; 2. Allocation not concealed; 3. Allocation concealment unclear; 4. Inadequate control for selection bias.
b Blinding key: 1. Not blinded to treatment assignment; 2. Not blinded outcome assessment; 3. Outcome assessed by treating physician.
c Selective Reporting key: 1. Not registered; 2. Evidence of selective reporting; 3. Evidence of selective publication.
d Follow-Up key: 1. High loss to follow-up or missing data; 2. Inadequate handling of missing data; 3. High number of crossovers; 4. Inadequate handling of crossovers; 5. Inappropriate exclusions; 6. Not intent to treat analysis (per protocol for noninferiority trials).
e Power key: 1. Power calculations not reported; 2. Power not calculated for primary outcome; 3. Power not based on clinically important difference.
f Statistical key: 1. Intervention is not appropriate for outcome type: (a) continuous; (b) binary; (c) time to event; 2. Intervention is not appropriate for multiple observations per patient; 3. Confidence intervals and/or p values not reported; 4.Comparative treatment effects not calculated.

## Observational Studies

Singh and Losken (2012) reported on a systematic review of studies reporting outcomes after reduction mammaplasty.[12,] 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.[13,] 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.[14,] 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.[15,] 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 (e.g., the weight of excised breast tissue).

### Adverse Events

Thibaudeau et al. (2010) conducted a systematic review to evaluate breastfeeding after reduction mammaplasty.[16,] 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.[17,] 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%; $p<0.001$). 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.[18,] 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.[19,20,]

### Section Summary: Reduction Mammaplasty for Macromastia-Efficacy in Reducing Symptoms

Systematic reviews, randomized trials, and observational studies have shown that several measures of function and quality of life improve after reduction mammaplasty.

## SUPPLEMENTAL INFORMATION

### Practice Guidelines and Position Statements

The purpose of the remaining sections in Supplemental Information is to provide reference material regarding existing practice guidelines and position statements, U.S. Preventive Services

Task Force Recommendations and Medicare National Coverage Decisions and registered, ongoing clinical trials. Inclusion in the Supplemental Information does not imply endorsement and information may not necessarily be used in formulating the evidence review conclusions.

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.[21,22,] This guideline was updated and reaffirmed in March 2021.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**
A search of ClinicalTrials.gov in December 2022 did not identify any ongoing or unpublished trials that would likely influence this review.

## 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<br>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<br>▪ Converted ICD-10 codes to ranges |
| | Updated References Section |
| 03-28-2023 | Updated Description Section |
| | Updated Rationale Section |
| | Updated Coding Section<br>▪ Removed ICD-10 Codes |
| | Updated References Section |

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## 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 | | |