Cranioplasty

PRIMARY AND REVISION SURGERY | Coverage, costs, recovery and financial protection
United States | Reviewed November 13, 2026

Cranioplasty repairs a skull defect after injury, earlier surgery or loss of diseased bone. It can restore contour and protect the brain. Revision may involve failed bone, an implant problem, infection or scalp breakdown. Financial planning should account for the original neurological illness as well as the reconstructive procedure. [8]

You deserve to understand the financial plan before surgery. Use this guide to prepare questions and compare written estimates; your own benefits and clinical plan determine the final bill.

What the cost tables mean

The ranges are editorial planning scenarios, not measured national averages, current fee schedules, or quotes. They describe plausible budgets across different settings. Revision prices are especially uncertain. Actual costs may be lower or substantially higher.

Allowed total: the estimated negotiated price paid jointly by an in-network insurer and patient. Insured share: 20% of that amount only after the deductible is met and before the applicable annual limit. Self-pay: a negotiated cash estimate before charity care, not the hospital's undiscounted sticker price.

An 80/20 PPO has no single standard deductible or annual limit. The tables assume covered, authorized, in-network services, no remaining deductible, and no prior progress toward the maximum. Therapy copays and other benefit designs may produce different results. [1]

A realistic insurance calculation

Example: $35,000 allowed total, $2,000 remaining deductible and $7,000 remaining out-of-pocket maximum. The preliminary share is $2,000 + 20% of $33,000 = $8,600. The applicable limit reduces covered in-network responsibility to $7,000. Premiums, excluded care, and ordinary out-of-network costs generally do not count toward that limit. [1]

Scope: adult U.S. care. Medicare, Medicaid, Medicare Advantage, employer plans and individual policies have different payment rules. Original Medicare is not the PPO illustrated here. CPT descriptions are paraphrased; the provider must verify current coding and bundling.

Billing & Necessity Basics

Codes to discuss with the billing office

CPT	Typical use - paraphrased
62140 / 62141	Skull-defect repair up to 5 cm / larger than 5 cm in diameter
62142 / 62143	Removal / replacement of a skull bone flap or prosthetic plate
62145	Skull-defect repair with reparative brain surgery
62146 / 62147	Autograft cranioplasty, including graft harvest, up to 5 cm / larger than 5 cm
62148	Retrieval of a bone graft stored beneath the skin; add-on when applicable

There is no single CPT code for every revision. The operation, defect and documented work determine coding. Removal, replacement and repair codes are not automatically all billable together. Diameter is not surface area. Hospitals also use inpatient procedure and diagnosis coding; the surgeon's CPT quote is not the hospitalization price. [9]

Medical necessity: first reconstruction

Ask the team to document defect size and cause, imaging, earlier operative notes, the protective or functional purpose and why the proposed graft or implant is appropriate. A reconstructive request should explain the clinical need even when contour improvement is also important. Coverage is plan-specific; there is no universal adult cranioplasty authorization checklist. [8]

Medical necessity: revision

Useful evidence may include infection workup and cultures, implant exposure, wound breakdown, bone resorption, loosening, displacement or another documented failure. Ask why the current device cannot be retained and why any scalp reconstruction or second surgical team is needed. Pain or contour concerns require assessment and documentation; they do not by themselves establish a covered revision.

For planned surgery, confirm the authorized procedure, facility, admission and additional surgeons. Verify any custom-device review and hospital procurement approval. Missing outside records or an inadequately explained reconstructive purpose can delay review. Urgent infection or exposed hardware needs prompt clinical assessment, not financial delay.

Insurance vs. Uninsured Landscape

Insured: coordinate the whole team

Expect potentially separate claims for the hospital, neurosurgeon, reconstructive surgeon, anesthesia, imaging and therapy. Ask about authorization and network participation for each. Approval for a first cranioplasty does not automatically cover removal, infection treatment or later reimplantation.

A custom synthetic device is not automatically an excluded cosmetic upgrade. Its coverage depends on the indication, policy and hospital payment arrangement. Ask whether the implant is included in the facility estimate and whether any proposed patient-pay surcharge is permitted under the applicable agreement.

Self-pay: negotiate an episode, not an implant price

Request separate professional and facility estimates plus assistance screening. Public cranioplasty research often reports hospital resource costs or billed charges, which are not current U.S. cash prices or insured patient balances. Evidence is too inconsistent to promise a national price for either primary or revision reconstruction. [10]

Hospital versus ambulatory surgery center

Substantial skull reconstruction typically requires a hospital with neurological monitoring and access to higher-acuity care. Do not assume a freestanding ASC is a suitable or available cheaper alternative. If outpatient care is proposed, confirm clinical suitability, current payer setting rules and transfer plans. Hospital neurosurgical floor or ICU care may be needed. [8]

Revision for infection may be a sequence

The team may remove infected bone or hardware, debride the wound, give organism-directed treatment and reconstruct later once conditions permit. Selected cases may use a different sequence. Timing depends on infection control, scalp condition and overall health; it cannot be chosen solely to minimize insurance resets. Prior infection and complex soft tissue can complicate reconstruction. [11]

> **For staged revision, request estimates for removal/debridement, infection treatment, wound or scalp surgery, interval visits and imaging, and later reconstruction. Ask whether each phase requires a new authorization. A single revision quote may cover only one of these phases.**

Ask the hospital about custom-implant lead time and cancellation liability. Record the device identity and keep earlier operative reports; these can help a new center plan revision.

Cost Breakdown: primary and revision

All figures are illustrative U.S. planning budgets, not sourced national averages. Facility allowances include the implant, fixation, operating room and a routine short stay. No original brain operation or institutional rehabilitation is included.

First reconstruction: short hospital episode

Expense	Allowed total	Your 20% share*	Self-pay total
Surgical professionals	$4,000-$10,000	$800-$2,000	$4,000-$12,000
Hospital / implant	$25,000-$65,000	$5,000-$13,000	$25,000-$80,000
Anesthesiology	$1,500-$4,000	$300-$800	$1,500-$5,000
Pre-op / imaging	$800-$2,500	$160-$500	$800-$3,000
Outpatient rehab	$0-$4,000	$0-$800	$0-$4,000
TOTAL	$31,300-$85,500	$6,260-$17,100*	$31,300-$104,000

Revision: one reconstructive operation

Expense	Allowed total	Your 20% share*	Self-pay total
Surgical professionals	$6,000-$18,000	$1,200-$3,600	$6,000-$20,000
Hospital / implant	$40,000-$110,000	$8,000-$22,000	$40,000-$130,000
Anesthesiology	$2,000-$6,000	$400-$1,200	$2,000-$7,000
Workup / imaging	$1,200-$5,000	$240-$1,000	$1,200-$6,000
Outpatient rehab	$0-$8,000	$0-$1,600	$0-$8,000
TOTAL	$49,200-$147,000	$9,840-$29,400*	$49,200-$171,000

*Before the applicable annual out-of-pocket cap, with the deductible met. These are arithmetic illustrations, not bills. Revision assumptions: failed-bone or implant reconstruction with greater operative complexity, without a separate infection-removal admission, free-flap reconstruction or prolonged ICU course.

Do not double-count components already included in a bundle. A two-stage infection course needs separate quotes; this revision total does not price the entire course. Rehabilitation may be minimal or extensive depending on the original neurological injury.

Hidden Expenses & Recovery Logistics

Costs that deserve a separate line in your budget

Custom planning and bone handling: ask whether design work, CT, models, guides, storage, retrieval, testing and transport are included. Establish responsibility for a manufactured device if the operation changes. Scalp reconstruction can add a surgeon and facility resources.

Equipment and home help: ask about prescribed protective helmets while a defect remains, shower equipment and mobility aids. Obtain supplier quotes. Ordinary supervision, meal preparation, medication reminders and personal care may not qualify as skilled home health.

Revision infection care: price the antibiotic, infusion supplies, pump if needed, line placement, nursing, dressing care, monitoring laboratories and infectious-disease visits separately. Confirm who covers line problems and whether home infusion or a clinic is the approved setting.

Prescriptions, repeated rides, parking, travel to a specialist, companion lodging and childcare can accumulate. Cognitive or neurological symptoms may lead to additional therapy or testing. Do not assume a device warranty pays for the associated medical services.

Time off work: plan around the neurological condition

Work / activity	First reconstruction	Revision planning allowance
Desk work, stable neurology	Often 4-8 weeks; phased return	Often 6-12+ weeks after definitive surgery
Persistent cognitive or neurological deficits	8-12+ weeks, sometimes much longer	Individualized; original illness may dominate
Heavy work / climbing / head-impact risk	8-12+ weeks and explicit clearance	Often 3+ months; restrictions may persist
Staged infection treatment	Not applicable	Months overall may be needed; count the interval between operations

These conservative budgeting windows are not established cranioplasty return-to-work benchmarks or medical clearance. Infection, scalp healing, seizures and the original brain injury can change them markedly. Driving and machinery require individualized neurological and medication review. [8]

Arrange home supervision if advised and request written lifting, climbing and work restrictions. Ask the employer about reduced hours, disability benefits and leave. Confirm whether you can perform the actual job safely, not simply whether the incision has healed.

Patient Playbook: the traps

Approval, networks and separate bills

"Approved" does not mean every expense is paid. Authorization, benefit eligibility, provider participation and patient cost-sharing are separate questions. A revision can need a new authorization even if the first operation was approved. A complication is not automatically excluded just because it followed elective surgery.

An in-network hospital may use independent anesthesiologists, radiologists and assistant surgeons. Under the No Surprises Act, most privately insured patients have protections for covered out-of-network ancillary care at an in-network hospital, hospital outpatient department or ASC. Anesthesia protections generally cannot be waived through notice and consent. A separate bill can be valid; prohibited balance billing is the problem. [2]

The law does not erase deductibles or coinsurance. Choosing an out-of-network facility can leave substantial exposure. Ground-ambulance balance bills generally fall outside federal protections; state rules may add protection. [2]

A hospital bed does not establish inpatient status

Observation is outpatient care, even overnight. Ask the care team each day about your status and request written notices of changes. Original Medicare generally requires three qualifying inpatient days for skilled-nursing coverage; observation does not count. Exceptions and Medicare Advantage rules can differ. A qualifying stay alone does not guarantee skilled-nursing eligibility. [5,6]

Bundles, warranties and plan-year resets

"All-inclusive" may exclude the implant, pre-op imaging, prescriptions, therapy or complications. Routine surgical follow-up may be included in the surgeon's global fee while imaging or treatment by another clinician is separate. Ask which services are bundled rather than assuming every extra bill is wrong.

A manufacturer warranty is not comprehensive revision insurance. Ask exactly which device or services, if any, it covers; it may not pay the hospital, surgeon, anesthesia or rehabilitation. Do not assume a product failure makes medical care free.

Two-stage treatment can cross two plan years. If each year has a fresh $2,000 deductible and $7,000 applicable maximum, $40,000 allowed care in year one and $60,000 in year two could produce $7,000 + $7,000 = $14,000 of covered in-network responsibility. This is an example, not a prediction.

A cash price paid outside insurance may not count toward your deductible or maximum. Hospital charity care may exclude independent clinicians. Verify both before paying. [7]

Patient Playbook: before surgery

1. Build one accurate description of the episode

Request the procedure and diagnosis codes, operated side where relevant, surgeon and facility names, billing identifiers, proposed implant, expected admission status, and anticipated rehabilitation. For revision, identify what will be removed, retained or replaced and whether treatment is one-stage or staged.

2. Verify your benefits directly

Call the insurer with that information. Ask: "Are these providers and this location in my exact network? What remains on my deductible and individual/family maximum? What are the surgery, therapy, equipment, home-health and prescription rules?" Save the reference number and request a portal response. Check the plan-year reset date.

3. Resolve authorization and appeal gaps

Get the authorization number, covered dates, codes and approved setting. Ask whether each revision stage, admission, infusion service and rehabilitation placement needs separate approval. For a denial, obtain the written reason and policy; ask the surgeon to provide missing evidence, pursue peer-to-peer review when available, and meet appeal deadlines. Request expedited review when medically warranted.

4. Get comparable written estimates

Using insurance: request a patient-specific estimate using current benefits. Self-pay: request a Good Faith Estimate from each billing entity, including the facility, surgeon and anesthesiology group. One entity's estimate may not include others. Request separately scheduled testing and therapy estimates too. [3]

Federal Good Faith Estimate rights generally apply when uninsured or choosing not to use insurance. Scheduling at least three business days ahead or requesting an estimate triggers applicable timing rules. Keep the estimate in writing; emergency care is different. [3]

5. Clarify the bundle and deposit

Ask whether implants, hardware removal, anesthesia, assistant surgeons, diagnostic work, overnight care, follow-up and rehabilitation are included. Obtain transfer, complication, cancellation and refund terms. For a custom device, ask who pays if manufacture begins but surgery is canceled.

6. Negotiate access before going out of network

If no suitable in-network specialist is reasonably available, request a network-gap exception and a single-case agreement. Obtain written terms from insurer and provider stating covered services, payment terms, in-network patient cost-sharing, and no balance billing beyond that share. An insurer's exception alone may not settle the provider's charges.

Patient Playbook: paying and disputing

7. Seek assistance before taking on debt

Ask the hospital financial counselor for charity-care and hardship screening, uninsured discounts and payment-plan terms. Apply even if insured; eligibility varies. Ask which independent clinicians participate in the hospital's assistance policy and contact others separately. Tax-exempt charitable hospitals must maintain financial-assistance policies. [7]

Before using a credit card or medical financing, obtain the corrected balance and compare interest, fees and deferred-interest terms. If negotiating a cash payment, request the agreed full settlement and any remaining exclusions in writing.

8. Price the discharge plan

Confirm the exact pharmacy, DME supplier, therapy clinic, home-health agency and any infusion provider. Check participation and authorization before service. Ask who will teach transfers, stairs and medication use. Arrange transport and caregiving; ask the discharge planner to address an unsafe or unaffordable plan.

9. Audit the EOB against the itemized bill

An Explanation of Benefits is not a bill. Match patient, date, procedure, side, network status, allowed amount, insurer payment, contractual adjustment and patient share. Check duplicate services, denied claims, missing deposits and amounts above the EOB responsibility. Request explanations of unfamiliar charges, not automatic deletion of all separate charges.

If disputed, ask billing for an itemized statement and the insurer for claim review. Request a written hold on the disputed amount while it is reviewed; do not assume collections stop automatically. Pay or arrange undisputed amounts as appropriate and keep receipts.

10. Use the right protection

For a potentially prohibited surprise bill, contact the provider and insurer, identify the No Surprises Act issue, and request proper in-network cost-sharing. Submit an unresolved complaint through cms.gov/medical-bill-rights or the No Surprises Help Desk, 1-800-985-3059. [2]

For uninsured/self-pay care, a bill from one provider at least $400 above that provider's Good Faith Estimate may qualify for federal patient-provider dispute resolution. Initiate it within 120 calendar days of the initial bill, subject to eligibility rules. This is different from an insured claim appeal. [4]

11. Keep a record and verify the final balance

Save estimates, authorizations, policy pages, assistance decisions, EOBs, receipts and call notes in one place. Before final payment, confirm insurance processing is complete, discounts and deposits are applied, and disputes resolved. For staged revision, repeat the review for each episode and each plan year.

Sources and appointment worksheet

Sources support coverage rules, coding, clinical pathways and published examples. They do not validate the editorial cost ranges as national market data. Blue source titles are clickable. Reviewed November 13, 2026.

[1] HealthCare.gov: Out-of-pocket maximum and exclusions | Open source

[2] CMS: Medical-bill rights when using insurance | Open source

[3] CMS: Good Faith Estimate rights without insurance | Open source

[4] CMS: Disputing a bill above a Good Faith Estimate | Open source

[5] Medicare: Inpatient versus outpatient status | Open source

[6] Medicare: Skilled nursing facility coverage | Open source

[7] IRS: Hospital financial-assistance policies | Open source

[8] Johns Hopkins: Cranioplasty and postoperative care | Open source

[9] Zimmer Biomet: Cranioplasty coding reference (2023; verify current rules) | Open source

[10] Original research: Cost of an additional plastic-surgery team | Open source

[11] Original research: Reconstruction after cranial osteomyelitis | Open source

Bring these questions to your next appointment

Which parts of my revision plan are separate episodes, and what must happen before reconstruction?

Who coordinates the implant, scalp coverage, infection treatment and neurological rehabilitation?

Record: insurer contact/reference _____ Authorization _____
Remaining deductible _____ Remaining maximum _____
Written episode estimate _____ Plan-year reset _____

Educational information, not an individual coverage decision or medical clearance. Obtain a written plan from your clinical team and insurer. Recheck policies, prices and codes before scheduling.