Scott&White HEALTH PLAN
PART OF BAYLOR SCOTT & WHITE HEALTH

MEDICAL COVERAGE POLICY

SERVICE: Biologicals for Wound Care and Procedures

Policy Number:	**210**
Effective Date:	**01/01/2020**
Last Review:	**10/31/2019**
Next Review Date:	**10/31/2020**

Important note
Even though this policy may indicate that a particular service or supply may be considered covered, this conclusion is not based upon the terms of your particular benefit plan. Each benefit plan contains its own specific provisions for coverage and exclusions. Not all benefits that are determined to be medically necessary will be covered benefits under the terms of your benefit plan. You need to consult the Evidence of Coverage to determine if there are any exclusions or other benefit limitations applicable to this service or supply. If there is a discrepancy between this policy and your plan of benefits, the provisions of your benefits plan will govern. However, applicable state mandates will take precedence with respect to fully insured plans and self-funded non-ERISA (e.g., government, school boards, church) plans. Unless otherwise specifically excluded, Federal mandates will apply to all plans. With respect to Senior Care members, this policy will apply unless Medicare policies extend coverage beyond this Medical Policy & Criteria Statement. Senior Care policies will only apply to benefits paid for under Medicare rules, and not to any other health benefit plan benefits. CMS's Coverage Issues Manual can be found on the CMS website.

SERVICE: Biologicals for Wound Care and Procedures

PRIOR AUTHORIZATION: Required in some instances

POLICY: This policy outlines the coverage of a heterogeneous group of products/substances that have been used to treat conditions such as diabetic and venous wound ulcers, burns, arthritic conditions, and fractures. The policy finds a vast majority of these treatments investigational in nature.

Biologics used in procedures (not medication), e.g.

- Platelet Rich Plasma (PRP)
- Skin Substitutes/Dermal matrix (SS/DM)
- Mesenchymal stem cells (MSC)
- Recombinant human bone morphogenic protein (BMP)
- Amniotic membrane transplant (AMT) for ophthalmologic procedures

Materials for Wound Care and Burns:

Skin Substitutes/Dermal matrix may be considered medically necessary in the following situations:

1. **Acellular dermal matrix** is considered medically necessary for either of the following uses:
   a. Surgical repair of complex abdominal wall wounds (e.g., due to infection, fascial defect, etc.); OR
   b. Breast reconstruction surgery.
   Note: Prior authorization is not necessary when an unanticipated need for acellular dermal matrix arises during a surgical procedure. However, the use of acellular dermal matrix under those circumstances may be reviewed retrospectively for medical necessity.
2. **Apligraf®** (Q4101) is considered medically necessary for a total of **five (5)** applications for either of the following indications:
   a. Venous insufficiency skin ulcers with ALL the following characteristics:
      - Chronic, non-infected, partial or full thickness ulcers due to venous insufficiency; AND
      - Standard therapeutic compression also in use; AND
      - At least one month of conventional ulcer therapy (such as standard dressing changes, and standard therapeutic compression) has been ineffective; OR
   b. Diabetic foot ulcers with all the following characteristics:
      - Full-thickness neuropathic diabetic foot ulcers; AND

- Extends through the dermis but without tendon, muscle, joint capsule, or bone exposure; AND
- At least three weeks of conventional ulcer therapy (such as surgical debridement, complete off-loading and standard dressing changes) has been ineffective.

3. **Dermagraft®** (Q4106) is considered medically necessary when used for either of the following indications:
   a. The treatment of full-thickness diabetic foot ulcers of greater than six weeks duration that extend through the dermis, but without tendon, muscle, joint capsule, or bone exposure; OR
   b. When used on wounds with dystrophic epidermolysis bullosa.
4. **Integra® Bilayer Matrix Wound Dressing** (Q4104) is considered medically necessary in the post-excisional treatment of full-thickness or deep partial-thickness burns when autografting is not feasible due to the individual's weakened physiological condition or a lack of suitable healthy tissue.
5. **OrCel™** (no specific code) is considered medically necessary in children with recessive dystrophic epidermolysis bullosa who are undergoing reconstructive hand surgery.
6. **Oasis Wound Matrix** (Q4102) may be considered medically necessary for treatment of difficult-to-heal chronic venous or diabetic partial and full-thickness ulcers of the lower extremity that have failed standard wound therapy of at least 6 weeks duration.
7. **Artiss** (C9250) Human Fibrin Sealant may be considered medically necessary for the treatment of individuals with severe burns.

   Artiss fibrin sealant is considered experimental and investigational for all other indications because its effectiveness for indications other than the one listed above has not been established.
8. **See list below for other coverage.**

Materials for Orthopedic Conditions:

1. **Platelet Rich Plasma** (PRP): Autologous blood-derived growth factors (i.e. platelet rich plasma) **are considered investigational.**
2. **Stem cells and Mesenchymal stem cells** (MSC).
   - Mesenchymal stem cell therapy is considered investigational and NOT a covered benefit for treatment of orthopedic indications.
   - Brain tissue transplantation, or stem-cell neuro-transplantation for treatment of Parkinson' Disease (embryonic or fetal allograft or auto-transplantation) is considered experimental and investigational and NOT a covered benefit.
3. **Recombinant human Bone Morphogenic Protein** (rhBMP-2 or rhBMP-7 only)
   Currently 2 rhBMPs have FDA approval for specific uses. They are:

- OP-1TM (Osteogenic Protein-1™ Implant,) consists of rhBMP-7 and bovine collagen which is reconstituted with saline to form a paste or putty (with carboxymethylcellulose added).
- The InFUSE® system is rhBMP-2 (dibotermin alfa) on an absorbable collagen sponge carrier.

4. The use of recombinant human bone morphogenetic protein-2 (rhBMP-2) is considered medically necessary for:
    - anterior lumbar interbody fusion (ALIF) procedure, (Not PLIF or TLIF- see below); OR
    - posterolateral lumbar intertransverse fusion procedure; OR
    - open fracture of the tibial shaft, which has been stabilized with intramedullary nail fixation after appropriate wound management.
5. The use of recombinant human bone morphogenetic protein-7 (rhBMP-7) is considered medically necessary for:
    - Treatment of tibial fracture nonunions after 7.5 months of conservative therapy, including electrical bone growth stimulation, when autologous bone graft is not feasible; or
    - As an alternative to autograft in compromised individuals requiring revision of posterolateral lumbar intertransverse fusion, when autologous bone and bone marrow harvest are not feasible or are not expected to promote fusion. Examples of compromising factors include osteoporosis, smoking and diabetes.
6. The use of recombinant human bone morphogenetic protein-2 or recombinant human bone protein-7 is **considered experimental and investigational** for conditions that do not meet the above criteria, including but not limited to:
    - cervical spinal fusion procedures;
    - posterior lumbar interbody fusion (PLIF) or transforaminal lumbar interbody fusion (TLIF);
    - As management of early stages of osteonecrosis of the vascular head or femoral shaft;
    - As an adjunct to distraction osteogenesis (Iliazarov procedure);
    - Craniofacial applications including, but not limited to, periodontal defect regeneration, cleft palate repair, cranial defect repair, restoration and maintenance of the alveolar dental ridge.

Other Conditions:

1. **Amniotic Membrane Transplantation** may be considered MEDICALLY necessary for the following ophthalmologic conditions after failure of conservative treatment:
    - Chemical and thermal injuries
    - Conjunctivochalasis
    - Conjunctival surface reconstruction
    - Corneal ulceration
    - Herpes zoster ophthalmicus
    - Limbal stem cell deficiency (partial or total): combined with stem cell graft

- Persistent epithelial defects
- Pterygium surgery
- Stevens-Johnson Syndrome
- Symblepharon lysis
- Symptomatic bullous keratopathy
- Trabeculectomy: bleb leakage or revision

V2790 - Amniotic membrane for surgical reconstruction, per procedure

All other products and indications, including orthopedic, are considered **experimental and investigational** because there is inadequate evidence in the peer-reviewed medical literature to support their clinical effectiveness**.**

Coverage Summary:

Wound Care/Burn Material	Code	Conditions
Acellular dermal matrix		Wound healing, breast reconstruction.
Artiss	C9250	Burns
Affinity1 square cm	Q4159	
Alloskin	Q4115	
Alloskin	Q4123	
Alloskin ac, 1 cm	Q4141	
Amnioarmor 1 sq cm	Q4188	
Amnioband, guardian 1 sq cm	Q4151	
Amnioexcel biodexcel 1sq cm	Q4137	
Apligraf	Q4101	Venous ulcers, diabetic ulcers
Architect ecm px fx 1 sq cm	Q4147	
Artacent ac 1 sq cm	Q4190	
Artacent wound, per sq cm	Q4169	
Biobrane Biosyntheic Dressing	Q4100	Burns
Bio-connekt per square cm	Q4161	
Biodfence 1cm	Q4140	
Biovance 1 square cm	Q4154	
Cytal, per square centimeter	Q4166	
Dermacell	Q4122	
Derma-gide, 1 sq cm	Q4203	
Dermagraft	Q4106	Epidermolysis bullosa, diabetic ulcers
Dermapure 1 square cm	Q4152	
Dermavest, plurivest sq cm	Q4153	
Epicel	Q4100	Deep burns when >30% BSA affected
Epicord 1 sq cm	Q4187	

Epifix	Q4186	Diabetic ulcers
Ezderm	Q4136	
Flexhd/allopatchhd/matrixhd	Q4128	
Floweramniopatch, per sq cm	Q4178	
Gammagraft	Q4111	
Grafix core	Q4132	Diabetic ulcers
Grafix prime	Q4133	Diabetic ulcers
Graftjacket	Q4107	Venous ulcers, diabetic ulcers
Helicoll, per square cm	Q4164	
Hmatrix	Q4134	
Hyalomatrix	Q4117	
Integra® Bilayer Matrix Wound Dressing	Q4104	Burns
Integra® Dermal Regeneration Template	Q4105	Burns, diabetic ulcers
Integra® Matrix	Q4108	
Keramatrix, per square cm	Q4165	
Kerecis omega3, per sq cm	Q4158	
Matristem micromatrix	Q4118	
Mediskin	Q4135	
Memoderm/derma/tranz/integup	Q4126	
Miroderm	Q4175	
Neox 100 or clarix 100	Q4156	
Neox neox rt or clarix cord	Q4148	
Nushield 1 square cm	Q4160	
Oasis Burn Matrix	Q4103	Burns
Oasis tri-layer wound matrix	Q4124	
Oasis Wound Matrix	Q4102	Venous ulcers, diabetic ulcers
OrCel	Q4100	Recessive dystrophic epidermolysis bullosa, donor site
Palingen or palingen xplus	Q4173	
Primatrix	Q4110	
Puraply 1 sq cm	Q4195	
Puraply am 1 sq cm	Q4196	
Revita, per sq cm	Q4180	
Revitalon 1 square cm	Q4157	
Surgigraft, 1 sq cm	Q4183	
Talymed	Q4127	
Tensix, 1cm	Q4146	
Theraskin	Q4121	
Woundex, bioskin, per sq cm	Q4163	

Amniotic Membrane for ocular surface	V2790	For ophthalmologic conditions – see indications above

All other products and materials are considered experimental and investigational, or unproven, because there is inadequate evidence in the peer-reviewed medical literature to support their clinical effectiveness. The following list is not all-inclusive:

C9356	Tendon, porous matrix of cross-linked collagen and glycosaminoglycan matrix (TenoGlide)
C9358	Dermal substitute, native, non-denatured collagen (SurgiMend Collagen Matrix)
C9360	Dermal substitute, native, non-denatured collagen, neonatal bovine origin (SurgiMend Collagen Matrix)
C9364	Porcine implant, Permacol
Q4112	Cymetra, injectable
Q4113	GRAFTJACKET XPRESS
Q4114	Integra Flowable Wound Matrix
Q4119	MatriStem wound matrix
Q4125	Arthroflex
Q4129	Unite biomatrix
Q4130	Strattice TM
Q4138	Biodfence dryflex
Q4139	Amniomatrix or biodmatrix, injectable
Q4142	XCM biologic tissue matrix
Q4143	Repriza
Q4145	EpiFix injectiable
Q4149	Excellagen
Q4150	Allowrap DS or dry
Q4155	Neoxflo or clarixflo
Q4167	Truskin
Q4168	Amnioband
Q4170	Cygnus
Q4171	Interfyl
Q4172	Puraply or puraply am
Q4174	PalinGen or ProMatrX
Q4176	NeoPatch
Q4177	FlowerAmnioFlo
Q4179	FlowerDerm
Q4181	Amnio Wound
Q4182	Transcyte

Q4205	Membrane Graft or Membrane Wrap
Q4206	Fluid Flow or Fluid GF
Q4208	Novafix
Q4209	SurGraft
Q4210	Axolotl Graft or Axolotl DualGraft
Q4211	Amnion Bio or AxoBioMembrane
Q4212	AlloGen
Q4213	Ascent
Q4214	Cellesta Cord
Q4215	Axolotl Ambient or Axolotl Cryo
Q4216	Artacent Cord
Q4217	WoundFix, BioWound, WoundFix Plus, BioWound Plus, WoundFix Xplus or BioWound Xplus
Q4218	SurgiCORD
Q4219	SurgiGRAFT-DUAL
Q4220	BellaCell HD or Surederm
Q4221	Amnio Wrap2
Q4222	ProgenaMatrix
Q4226	MyOwn Skin, includes harvesting and preparation procedures

OVERVIEW:

1. Platelet-rich plasma:

   PRP has been investigated as an adjunct to a variety of periodontal, reconstructive, and orthopedic procedures. In addition, platelet-rich plasma has also been proposed as a primary treatment of miscellaneous conditions such as epicondylitis, plantar fasciitis and Dupuytren's contracture.

   Typically, the platelet-rich material is injected into joint area with the goal of accelerating the healing process. A meta-analysis of 10 trials assessing the effect of PRP injections in patients with knee OA found a significant difference in pain scores in the PRP-treated groups(8). However, the majority of the trials revealed a high likelihood of biases, and only one of the trials compared PRP injections with placebo. No trials have examined the structural effects of PRP in OA joints. There is a lack of standardization of the preparations of PRP amongst the trials, with varying concentration of platelet, frozen versus fresh preparations, and the filtration of white cells. The clinical trials have yet to conclusively demonstrate efficacy of the treatment. The available controlled studies do not provide consistent evidence that PRP improves outcomes in patients with ACL injury. Three RCTs found that PRP did not provide any significant benefits as a treatment for rotator cuff injuries, Achilles tendinopathy, or Achilles tendon rupture.

2. Skin substitutes/Dermal matrix:

   Skin substitutes can be biological or synthetic substitutes. These products may be derived from allogeneic, xenographic, synthetic, or any combination of these. The biological skin substitutes

have a more intact extracellular matrix structure, while the synthetic skin substitutes can be synthesized on demand. Both have advantages and disadvantages. The biological skin substitutes form a more natural new dermis and allow epithelialization because of the presence of a basement membrane.

Wound: The published evidence regarding the safety and efficacy of biological tissue-engineered skin substitutes is limited and does not clearly demonstrate a benefit versus optimal standard wound care. No studies provided an adequate direct comparison of the different skin substitute products. More research is needed to compare different skin substitutes and to determine appropriate patient selection criteria.

Breast: Dermal matrices are considered a standard-of-care with breast reconstruction, with fewer complications and better results. Early literature focused on AlloDerm brand of acellular dermal matrix, as the initial product. Recent literature comparing acellular dermal matrix products conclude there is no significant difference among products (see, e.g., Ibrahim, et al., 2013; Cheng, et al., 2012).

3. Mesenchymal skin cells:

   The American Academy of Orthopedic Surgeons (2007) provides information on stem cells:

   > Bone marrow stromal cells are mesenchymal stem cells that, in the proper environment, can differentiate into cells that are part of the musculoskeletal system. They can help to form trabecular bone, tendon, articular cartilage, ligaments and part of the bone marrow.

   The statement was revised in 2017: “The increasing shift to therapeutic biologic products for restoring structure and function presents new questions of safety and effectiveness. No longer reserved for treating trauma and soft tissue injuries, biologic therapies are now explored as options for osteoarthritis. As we note in the statement “Innovation and New Technologies in Orthopaedic Surgery,” surgeons must be aware of the scientific basis for the different treatment options offered to their patients, including the benefits and risks. The varying regulatory pathways by which biologic therapies come to market require the additional burden for surgeons to become familiar with the Food and Drug Administration’s current thinking with respect to the source, retrieval and/or manufacturing methods, processing, storage, and use of these products, whether alone or as part of combination products.

   The American Academy of Orthopaedic Surgeons (AAOS) believes that surgeons should be cognizant of the risks, benefits, regulatory status and labeled indications of the products they use. Unlike devices, the effects of these products may not be limited to the duration of their implantation. Autogenous products may be subject to regulatory review.”

4. Recombinant human Bone Morphogenic Protein rhBMPs:

   Osteogenic proteins or bone morphogenic proteins (BMPs) are bone-matrix polypeptides that induce a sequence of cellular events leading to the formation of new bone. Some of the potential clinical applications of BMPs are: (i) as a bone graft substitute to promote spinal fusion and to aid in the incorporation of metal implants, (ii) to improve the performance of autograft and allograft bone, and (iii) as an agent for osteochondral defects.

Recombinantly produced human osteogenic protein-1 (OP-1), also known as BMP-7, was developed by Stryker and approved by the Food and Drug Administration (FDA) as a Humanitarian Use Device (HUD).

The INFUSE Bone Device (Medtronic Sofamor Danek) includes rhBMP-2 in a collagen absorbable sponge and a titanium spinal cage, and has been approved for spinal fusion in persons with single-level degenerative disc disease from L4 to S1, anterior approach only, after failure of 6 months of conservative treatment. Studies showed clinically equivalent fusion rates between the groups using INFUSE and autologous bone, with similar outcomes in terms of back pain, leg pain, disability and neurological status.

5. Amniotic Membrane transplant:

   Ocular injuries due to trauma or disease that do not respond to conservative treatment may benefit from the use of AMT. The amniotic membrane has properties that are helpful in wound healing, particularly in ocular injuries. The amniotic membrane is the inner layer of the fetal sac, a stromal matrix, with a thick collagen layer and a single layer of epithelium. It suppresses growth factor to minimize scar formation and promotes cellular migration for improved healing.

MANDATES: None

SUPPORTING DATA:

CODES:

Important note:
CODES: Due to the wide range of applicable diagnosis codes and potential changes to codes, an inclusive list may not be presented, but the following codes may apply. Inclusion of a code in this section does not guarantee that it will be reimbursed, and patient must meet the criteria set forth in the policy language.

CPT Codes:	15271 - 15278 - Application of skin substitute
CPT Not Covered:	
HCPCS Codes	C9250 Artiss Q4159 Affinity1 square cm Q4115 Alloskin Q4123 Alloskin Q4141 Alloskin ac, 1 cm Q4188 Amnioarmor 1 sq cm Q4151 Amnioband, guardian 1 sq cm Q4137 Amnioexcel biodexcel 1sq cm Q4101 Apligraf Q4147 Architect ecm px fx 1 sq cm Q4190 Artacent ac 1 sq cm Q4169 Artacent wound, per sq cm Q4100 Biobrane Biosyntheic Dressing Q4161 Bio-connekt per square cm Q4140 Biodfence 1cm Q4154 Biovance 1 square cm Q4166 Cytal, per square centimeter Q4122 Dermacell

	Q4203 Derma-gide, 1 sq cm Q4106 Dermagraft Q4152 Dermapure 1 square cm Q4153 Dermavest, plurivest sq cm Q4100 Epicel Q4187 Epicord 1 sq cm Q4186 Epifix Q4136 Ezderm Q4128 Flexhd/allopatchhd/matrixhd Q4178 Floweramniopatch, per sq cm Q4111 Gammagraft Q4132 Grafix core Q4133 Grafix prime Q4107 Graftjacket Q4164 Helicoll, per square cm Q4134 Hmatrix Q4117 Hyalomatrix Q4104 Integra® Bilayer Matrix Wound Dressing Q4105 Integra® Dermal Regeneration Template Q4108 Integra® Matrix Q4165 Keramatrix, per square cm Q4158 Kerecis omega3, per sq cm Q4118 Matristem micromatrix Q4135 Mediskin Q4126 Memoderm/derma/tranz/integup Q4175 Miroderm Q4156 Neox 100 or clarix 100 Q4148 Neox neox rt or clarix cord Q4160 Nushield 1 square cm Q4103 Oasis Burn Matrix Q4124 Oasis tri-layer wound matrix Q4102 Oasis Wound Matrix Q4100 OrCel Q4173 Palingen or palingen xplus Q4110 Primatrix Q4195 Puraply 1 sq cm Q4196 Puraply am 1 sq cm Q4180 Revita, per sq cm Q4157 Revitalon 1 square cm Q4183 Surgigraft, 1 sq cm Q4127 Talymed Q4146 Tensix, 1cm Q4121 Theraskin Q4163 Woundex, bioskin, per sq cm V2790 Amniotic membrane
ICD10 codes	Platelet Rich Plasma M72.2 - Plantar fascial fibromatosis M76.5 - Patellar tendinitis M76.6 - Achilles tendinitis

	M77.1 - Lateral epicondylitis S46.0 - Injury of tendon of the rotator cuff of shoulder S76.1 - Injury of quadriceps tendon and muscle S83.4 - Sprain and strain involving fibular collateral ligament of knee S83.5 - Sprain and strain involving anterior cruciate ligament of knee S86.0 - Injury of Achilles tendon Bone morphogenetic protein M45.x* - Ankylosing spondylitis M47.x* - Spondylosis M50.x* - Cervical disc disorders M51.x* - Other intervertebral disc disorders S82.x* - Fracture of tibia Alloderm: C50.011 - C50.929 Malignant neoplasm of breast C79.81 - Secondary malignant neoplasm of breast D05.00 - D05.92 Carcinoma in situ of breast Other: T20.011+ - T25.799+ - Burns E08.621 - Diabetes mellitus due to underlying condition with foot ulcer E09.621 - Drug or chemical induced diabetes mellitus with foot ulcer E10.621 - Type I diabetes mellitus with foot ulcer E11.621 - Type II diabetes mellitus with foot ulcer E13.621 - Other specified diabetes mellitus with foot ulcer I87.311 - I83.319 - Chronic venous hypertension with ulcer I87.331 - I87.339 - Chronic venous hypertension with ulcer and inflammation *"x" is a range of codes; code dependent on specific diagnosis*

CMS:

Platelet Rich Plasma: No NCD or LCD found

CMS issued its third non-coverage determination 8/2/2012, stating: "In summary, we conclude that PRP for Medicare beneficiaries with chronic non-diabetic, pressure, and/or venous wounds is not reasonable and necessary under §1862(a)(1)(A)."

However, proposed CMS coverage: "an autologous blood-derived product, will be covered only for the treatment of chronic non-healing diabetic, venous and/or pressure wounds and only when" the patient is enrolled in a randomized clinical trial that is CMS approved via CED (Coverage with Evidence Development.)

Skin Substitutes/Dermal matrix:

LCD L35041; LCD Title: Application of BIOENGINEERED Skin Substitutes to Lower Extremity Chronic Non-Healing Wounds

LCD L35125; LCD Title: Wound Care

Bone morphogenetic protein: No NCD or LCD found

In 2010, CMS published a technology assessment of the on-label and off-label use of rhBMP, which came to the following conclusions (Ratko et al., 2010):

- Strength of the body of evidence supporting improved outcomes with on-label use of rhBMP-2 (Infuse) was graded as moderate.

- Strength of the body of evidence supporting improved radiographic fusion success with off-label use of rhBMP-2 in fusion of the lumbar sacral spine was graded as moderate; the strength of other outcomes was graded as low.
- There was insufficient evidence to reach conclusions concerning radiographic fusion or associated changes in neck disability scores with the off-label use of rhBMP-2 in anterior cervical spinal fusion.
- There was insufficient evidence to reach conclusions concerning outcomes with on-label use of rhBMP-7 (OP-1) or with off-label use of rhBMP-7 in fusion of the lumbar sacral spine.
- Evidence on BMP-specific adverse events is insufficient to draw conclusions of safety in most settings; however, there is moderate evidence that off-label use of rhBMP-2 in anterior cervical spinal fusion increases cervical swelling and related complications.
- Quality of reporting in the studies reviewed was variable and inconsistent, in particular with respect to attribution of adverse events to BMP use and the use of standardized or validated instruments to collect adverse events.

Amniotic membrane transplant: No NCD or LCD found

POLICY HISTORY:

Status	Date	Action
New	03/27/2014	New policy
Reviewed	04/09/2015	Minor corrections
Reviewed	04/14/2016	Updated coverage
Reviewed	04/18/2017	Revised coverage criteria.
Reviewed	04/03/2018	Modified list of materials covered.
Updated	05/01/2018	Added to list of materials not covered: TenoGlide
Updated	06/26/2019	Covered and not covered code lists updated.
Revised	10/31/2019	Coverage aligned with LCD

REFERENCES:

The following scientific references were utilized in the formulation of this medical policy. SWHP will continue to review clinical evidence related to this policy and may modify it at a later date based upon the evolution of the published clinical evidence. Should additional scientific studies become available and they are not included in the list, please forward the reference(s) to SWHP so the information can be reviewed by the Medical Coverage Policy Committee (MCPC) and the Quality Improvement Committee (QIC) to determine if a modification of the policy is in order.

Reference for Platelet Rich Plasma

1. Ujash S, Simunovic N, Klein G, Fu F, Einhorn T, Schemitsch E, Ayeni O, Bhandari M. Efficacy of Autologous Platelet-Rich Plasma Use for Orthopaedic Indications: A Meta-Analysis. J Bone Joint Surg Am. 2012;94:298-307
2. Lee K, Wilson J, Rabago D, Baer G, Jacobson J, Borrero C. Musculoskeletal Applications of Platelet-Rich Plasma: Fad or Future? AJR 2011; 196:628–636
3. Hee HT, Majd ME, Holt RT, et al. Do autologous growth factors enhance transforaminal lumbar interbody fusion? Eur Spine J 2003;12:400-7
4. Yassibag-Berkman Z, Tuncer O, Subasioglu T, et al. Combined use of platelet-rich plasma and bone grafting with or without guided tissue regeneration in the treatment of anterior interproximal defects. J Periodontol. 2007;78(5):801-9
5. Carreon LY, Glassman ST, Anekstein Y, et al. Platelet gel (AGF) fails to increase fusion rates in instrumented posterolateral fusions. Spine 2005;30(9):E243-6

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7. Driver VR, Hanft J, Fylling C, et al. A prospective, randomized controlled trial of autologous platelet-rich plasma gel for the treatment of diabetic ulcers. Ostomy Wound Manage 2006;52(6):68-87

Reference for skin/dermal substitutes

1. Agency for Healthcare Research and Quality (AHRQ) Website. Technology Assessment. Negative pressure wound therapy devices. November 12, 2009.
2. Institute for Clinical Systems Improvement Website. Health Care Protocol: Pressure ulcer prevention and treatment protocol. January 2012. Available at: http://www.icsi.org
3. American Society of Plastic Surgeons (ASPS) [website]. Evidence-based Clinical Practice Guideline: Chronic Wounds of the Lower Extremity. May 21, 2007.
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Reference for mesenchymal stem cells

1. Bonab MM, Alimoghaddam K, Talebian F, et al. Aging of mesenchymal stem cell in vitro. BMC Cell Biol. 2006; 7:14.
2. Buda R, Vannini, Cavallo, M, et al. One-step arthroscopic technique for the treatment of osteochondral lesions of the knee with bone-marrow-derived cells: three year results. Musculoskelet Surg. 2013; 97(2):145-151.
3. Filardo G, Madry H, Jelic M, et al. Mesenchymal stem cells for the treatment of cartilage lesions: from preclinical findings to clinical application in orthopaedics. Knee Surg Sports Traumatol Arthrosc. 2013 Jan 11. [Epub ahead of print].
4. American Academy of Orthopaedic Surgeons. Stem cells and orthopaedics. Last reviewed September 2007. Available at: http://orthoinfo.aaos.org/topic.cfm?topic=A00501. Accessed on July 3, 2013.
5. National Cancer Institute. Available at: http://www.cancer.gov. Accessed on July 3, 2013.
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Reference for recombinant human bone morphogenic protein

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2. Vaccaro AR, Anderson DG, Patel T, et al. Comparison of OP-1 Putty (rhBMP-7) to iliac crest autograft for posterolateral lumbar arthrodesis: a minimum 2-year follow-up pilot study. Spine (Phila Pa 1976). 2005; 30(24):2709-2716.
3. Villavicencio AT, Burneikiene S, Nelson EL, et al. Safety of transforaminal lumbar interbody fusion and intervertebral recombinant human bone morphogenetic protein-2. J Neurosurg Spine. 2005; 3(6):436-443.
4. Williams BJ, Smith JS, Fu KM, et al.; Scoliosis Research Society Morbidity and Mortality Committee. Does bone morphogenetic protein increase the incidence of perioperative complications in spinal fusion? A

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Reference for amniotic membrane transplant for ophthalmologic procedures

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