HYPE OR HOPE?

What is Regenerative Medicine?

Regenerative medicine refers to therapies that are able to repair, restore and regenerate damaged tissues in the body. These treatments represent a significant advancement from traditional ones that only offer symptom relief as a proverbial “band-aid”.

Regenerative procedures come in two forms. Those that require a biologic harvest from the patient (bone marrow or adipose tissue), or those that come from an external source (e.g. PRP Therapy, amniotic fluid/membrane, and umbilical cord blood/tissue).

There are significant myths and misinformation that have been propagated regarding the external source regenerative biologics. A lot of these myths are disseminated by industry competitors who have presented biased and manipulated data to confuse prospective patients.

In this Consumer Guide, R3 Stem Cell will debunk these myths so consumers can make an educated decision regarding their healthcare decisions.

What do they contain?

Known as the “products of conception”, the regenerative materials from amniotic and umbilical tissue include the following:

- Amniotic Fluid
- Placental membrane
- Umbilical Cord Tissue
- Umbilical Cord Blood
- Wharton’s Jelly

The exact function of these materials supporting growth and health of the fetus is outside the scope of this guide. However, understand that a lot of the functions provided during fetal growth translate into patient benefit during regenerative procedures such as preventing infection and tissue growth of all types such as collagen, tendon, lung, kidney, heart, etc.

Research performed on the products of conception have shown several benefits to what the materials contain including:

- High numbers of Stem Cells
- Concentrations of Growth Factors
- High numbers of Cytokines
- Additional elements including exosomes, microsomes, secretomes, mRNA.

The best analogy applicable is that the products of conception produce regenerative materials that contain a full "orchestra" of components to treat patients!

Note: You may see competitor marketing materials that state "products of conception" do not contain live cells. This is true if the biologics are radiated during processing or contain too much preservative. But it is **not true** if the materials have been processed without significant radiation or preservatives. This is why R3 is VERY careful about the labs we work with so patients receive products that are safe and of the highest quality to produce the best outcomes possible!

How are they acquired?

The amniotic and umbilical cord tissues are obtained from healthy, consenting donors who are under the age of 35 and undergoing a scheduled c-section. The FDA strictly regulates the process of how these tissues are acquired, tested, processed and stored to ensure the highest level of patient safety.

During a normal, scheduled c-section, the products of conception are normally discarded. This includes the amniotic fluid, placenta, umbilical cord and accompanying materials. In this case, the products of conception are donated by the mother, with the baby being fine. The materials are placed in a sterile container and taken to the nearby FDA registered, certified laboratory right away.

Are there any ethical issues with these biologics?

No there are not. None of the biologic materials come from "aborted fetuses". During the biologic acquisition, the babies are fine and the material donated and used is normally discarded.

In addition, no embryonic stem cells are used in the US anymore legally. There is no fetal tissue, no cloning and all donors are consented and screened according to FDA regulations.

So what this means is there are NO ethical concerns with the materials being used from the products of conception.

What conditions benefit from their use?

The list of conditions that benefit from amniotic/umbilical procedures is extensive and continues to grow. With the way these biologics are regulated by the FDA, they may be used for conditions where physicians deem them to be safe and clinically useful. *Our disclaimer is consistent: No treatments mentioned here have been evaluated by the FDA. As with any medical treatment, R3 Stem Cell does not guarantee any particular outcome. No treatment protocol or specific biologic indication has been evaluated or approved by the FDA.*

In the research literature and from our provider's experience, there are benefits being shown for:

- Arthritis: All Types
- Soft Tissue Conditions: Tendonitis, Bursitis, Ligament Injury (e.g. Achilles, Knee, Rotator Cuff)
- Sports Injuries
- Neurologic Conditions:
- Heart/Kidney/Lung Failure (e.g. Cardiomyopathy, COPD)
- Autism
- Cerebral Palsy
- Trigeminal Neuralgia
- Migraines and Cluster Headaches
- Post Herpetic Neuralgia
- RSD
- Neuropathy
- Pelvic Pain
- Back Pain
- Diabetes

- Lyme Disease
- Plantar Fasciitis
- Phantom Limb Pain
- SI Joint Pain
- Tennis/Golfers Elbow
- Fibromyalgia
- Erectile Dysfunction

Does insurance cover regenerative procedures?

Currently insurance does not cover regenerative procedures. There are several reasons for this and it is not because they "don't' work." Insurance coverage gets complicated even for FDA Approved drugs, and keep in mind there is no way a pharmaceutical company can patent amniotic fluid or umbilical cord tissue!

It is extremely common for new technology to take 5-10 years before it becomes accepted for coverage from commercial payers and Medicare. One excellent advancement is that several states now coverthe treatmentundera Worker's Compensation claim, since it has been shown to be helpful getting patients back on the job!

R3 Stem Cell's Centers do not want finances to get in the way of receiving regenerative treatment. For this reason there are several financing options and payment plans available.

What is the difference between these products and PRP Therapy?

PRP stands for platelet rich plasma and involves a simple blood draw from the patient. This blood is placed into a kit and spun quickly for 10-15 minutes in a centrifuge machine. What this does is separate the blood into several layers.

The middle layer is termed the "buffy coat" and contains concentrated platelets, white blood cells, and 8-12 growth factors. There are minimal stem cells in PRP, if any, so it is a very helpful regenerative biologic but not a stem cell therapy.

Amniotic and umbilical cord materials contain over 80 growth factors along with an extensive amount of cytokines, mRNA, exosomes, secretomes and additional biologic elements including stem cells. The amount of these elements varies depending on the lab that processes the material and depends on the amount of preservative, radiation, etc.

Is there any research on amniotic and umbilical cord stem cells?

A considerable body of research on products of conception has either been published in peer reviewed journals or presented at professional society meetings nationwide. New studies are added monthly to this body of work, and time after time usage of amniotic and umbilical materials has been shown to be safe.

In addition, these materials have been shown to work well overall for musculoskeletal conditions, neurodegenerative issues, autism, stroke, organ failure, autoimmune conditions and “tough to treat” issues like Lyme disease.

We have listed several references at the bottom of this guide for review and go to pubmed.com for a comprehensive list by searching.

Are all amniotic and umbilical cord products the same?

The short answer is no. While the actual biologic material from the donor is extremely similar, the processing can vary. All donors are heavily screened for diseases and are under the age of 35. The DNA factors are removed to prevent rejection, making the biologic material immunologically privileged.

The main differences occur when the material is processed at the FDA Certified lab. While the FDA is strict about how the materials are processed, there are some significant differences that can take place. For instance, some labs will radiate the biologic which essentially kills all the cells. Others will use a LOT of preservative which will kill all the cells instead of preserving them.

Suffice it to say that not all of these products are the same once processing is complete. So it is critical to receive treatment from an expert provider who is using a quality product. R3 Stem Cell has vetted the materials used extensively, which is just one reason why over 10,000 patients have received treatment at our Centers of Excellence over the past six years.

Why are regenerative procedures with these products so popular?

1. No harvest

- Bone marrow derived stem cell procedures require an aspiration from the patient's iliac crest (pelvis). Studies have shown a 29% incidence of chronic pain from the aspiration procedure along with potential for additional complications such as nerve/vessel injury, bowel perforation, fracture.
- In addition, as one ages the quantity and quality of stem cells obtainable from the bone marrow drops exponentially. It is illegal in the US to culture one's bone marrow to amplify cell counts. At birth, 1 in 10,000 cells in one's bone marrow is a stem cell. This drops to 1 in 2 million by age 70. No matter how much one's bone marrow is concentrated, the cell counts are a problem.
- Adipose derived stem cell procedures require a mini-liposuction from the abdomen or buttock. The first problem with this is that plenty of patients simply do NOT have significant adipose tissue to spare.
- The second problem with adipose procedures is interesting. Adipose tissue contains VERY HIGH numbers of stem cells. However, once the adipose is processed and moved to your area of treatment, over 80% of them die within two days. So they do not even get a chance to help!

2. Safe

- Studies have shown that bone marrow aspiration procedures have a high incidence of complications. Twenty nine percent of patients end up with chronic pain, which is a real problem when the objective is to actually rid patients of pain. Can you imagine that conversation, "Hey doc my knee feels awesome but what did YOU DO TO MY HIP!"

- Additional complications reported from bone marrow aspirations include infection, bleeding, nerve/vessel injury, bowel perforation, pelvic fracture.
- The mini-liposuction procedure does not have a high incidence of complications. However, as mentioned, most of the stem cells from that procedure die within 48 hours. Real bummer.
- On the other hand, all of these issues are avoided by not having to use a harvesting procedure.
- In addition, the amniotic fluid does not have HLA factors in sufficient quantity to cause a rejection in the recipient. Also known as MHC factors, these are the cell components that would lead to a Graft versus Host reaction if they were present in sufficient concentrations. The amniotic fluid is immunologically privileged as a result.
- The umbilical cord tissue/blood material could cause a rejection reaction if not treated properly. As an example, if one receives a blood transfusion from an incompatible donor the blood will be rejected with a potentially very serious reaction. To prevent that from happening, all red blood cells are removed from the umbilical cord blood. This removes the HLA factors and prevents the Graft versus Host reaction.

3. Consistent

- Amniotic and umbilical materials are very consistent. When the processing occurs at first rate labs certified by the FDA, the amount of cells is very high and extremely consistent. Unlike adipose and bone marrow, where the cell counts drop big time with aging and the quality of those cells diminishes as well.
- One thing that should be noted is the MYTH that there are no live cells in processed amniotic fluid. The FDA does not require the material to be radiated, and if a low amount of preservative is used the cells survive the processing. In addition, cryopreservation does not kill cells. (If it did, egg donor programs would go out of business.) So labs that don't radiate and use minimal preservative get plenty of live cells!

4. Excellent outcomes

- There are too many studies to count looking at the effectiveness of amniotic/umbilical tissue to treat musculoskeletal conditions. Pubmed.com is a great source of data and we have listed some excellent references at the bottom of this Guide.

- When you look at the very high Benefit profile and the very low Risk profile of these materials, in medicine that is called a HOME RUN!

Will stem cell procedures with amniotic/umbilical tissue heal or cure my condition?

It is improper for ANYONE to provide an unrealistic expectation of what these treatments can do. Using the words “heal” or “cure” is inappropriate and propagates distrust among patients. No study shows 100% effectiveness, and more likely than not patients will see improvement and relief, but NOT a cure. We get asked all the time if our affiliated providers offer a “Guarantee”, and the answer is no because medical treatments are never fool proof.

More reasonable words to use are facilitate, mitigate, or improve. The biologic elements in these materials work together to repair damaged tissue and also facilitate one’s own body to assist in the process as well. Just how much improvement achieved will vary since people are UNIQUE AND DIFFERENT!

How exactly do these materials work?

The father of modern stem cell therapy is Dr. Arnold Caplan, a researcher at Case Western Reserve University. His extensive work has shown that the regenerative materials used are predominantly acting as signals to one’s body, telling the body to “get to work” and repair itself.

He actually recommends changing the abbreviation of MSC’s, which normally stands for Mesenchymal Stem Cells, to Medicinal Signaling Cells. The goal is to “more accurately reflect the fact that these cells home in on sites of injury or disease and secrete bioactive factors that are immunomodulatory and trophic (regenerative) meaning that these cells make therapeutic drugs in situ that are medicinal.”

He continues, “It is, indeed, the patient’s own site-specific and tissue-specific resident stem cells that construct the new tissue as stimulated by the bioactive factors secreted by the exogenously supplied MSCs.”

What are the Risks of Amniotic and Umbilical Tissue?

Overall, the risk profile of these materials is exceptionally low. They do not contain steroid, so there is no worry of adrenal gland or blood sugar issues.

Standard procedure risks exist that include infection, bleeding, nerve injury, allergic reaction. As an example, many providers willuse contrast to ensure accurate needle placement. Once in a blue moon, this contrast material may spark an allergic reaction.

Additional risks may include disease transmission or rejection reaction. As mentioned earlier, the FDA certified lab goes through considerable processing to remove ANY DNA factors that could cause this reaction. In addition, the FDA has very strict regulations on how the tissue is tested for many, many diseases. After thousands of cases, R3’s affiliated providers have never seen either of these issues but it needs to be mentioned.

The biggest risk actually with any regenerative procedure, whether performed with bone marrow, adipose, amniotic or umbilical tissue, is that it may not work. While that is a sub-optimal outcome obviously, no bridge has been burned. With a joint replacement, there is no going back. Same with an organ transplant!

Are these procedures FDA Approved?

No they are not. They are not regulated as drugs, rather they fall into the biologics category. These are regulated heavily by the FDA, but do not get approved or denied. All our umbilical cord stem cell are F.D.A. regulated. Patient receives a certificate of analysis and tissue ID Number.

Here is how the FDA regulates things:

1. **Medical devices** – joint implants, screws/rods, DME, etc. In the world of regenerative medicine, this only applies to the kits used in PRP, bone marrow or adipose procedures.

2. **Drugs** – think of Lipitor, Vicodin, Viagra, etc. These are medications that have gone through a clinical trial and been approved for a specific indication.
3. **Biologics** – the FDA strictly regulates how biologic materials are acquired, processed, stored and used under the CFR Part 1271. Amniotic and umbilical materials fall under this category, which does not involve an Approval/Denial process like drugs do.
    - Specifically, the section under Part 1271 that applies to amniotic/umbilical tissues is Section 361 products, which are not required to be licensed or approved by the FDA and are regulated under Section 361 of the Public Health Service (PHS) Act.

Where can I find a reputable provider for these procedures?

Only A handful of board-certified stem cell medical doctors are in the U.S.

Our Center provide care by board certified regenerative medicine Doctors.

Please call us for a free consultation.

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