M·C·T
Meta Cell Technology

MCT SYSTEM

THE **TOP 50 QUESTIONS** WE HEAR MOST OFTEN

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MCT SYSTEM GENERAL QUESTIONS

What is the MCT System and why should I have it in my clinic?

The MCT System is a pioneering technology that enhances regenerative medical treatments through the application of electromagnetic and thermal energy. At the core of the system lies the MCT Kit®, a patented medical-grade cassette precisely designed for photothermal conditioning; and the MCT Unit®, a device equipped to generate and apply the photothermal stimulus.

Which is the innovative concept behind MCT Technology?

The synergy between the cutting-edge features of the MCT Kit® and the versatile functionality of the MCT Unit® forms the foundation of a revolutionary innovation conceived to elevate the regenerative potential of platelet-rich plasma (PRP) and cell-based therapies, while stimulating the production and delivery of autologous exosomes.

Which unique features define the MCT Unit®?

The MCT Unit® emits light across a versatile wavelength spectrum (467 nm to 850 nm): blue light (467 nm), green light (530 nm), yellow light (591 nm), red light (620 nm), and infrared light (850 nm). Additionally, it is equipped to stimulate biological materials within a temperature range of 4°C to 45°C.

What key properties make the MCT Kit® a game-changer?

The MCT Kit® is a patented medical-grade cassette serving as the receptacle for patient material, uniquely designed to fit in the MCT Unit®. It has two syringe docking sites (standard and Luer Lock® compatible) to insert and extract autologous material.

What effects does MCT photobiomodulation elicit?

Direct exposure of cells to light profoundly affects chromophores, including cytochrome C oxidase and opsins. These light-responsive receptors activate second messengers (ROS, Ca^{2+}, ATP, cAMP, NO), modulating cell signaling pathways.

What outcomes does MCT thermal biomodulation achieve?

It is well known that low temperatures (4°C) prime platelet activation and trigger the release of growth factors (VEGF, EGF, and bFGF) from α-granules. Additionally, temperature directly influences exosome secretion kinetics, with increased exosome release at physiological temperatures (37°C).

What treatments can be enhanced with MCT technology and to what extent?

All autologous materials can be enhanced with the MCT System. That is, basically, PRP, stromal vascular fraction (SVF), and every other regenerative medicine preparate. Therapy enhancement translates, for instance, into considerably fewer sessions and stunning clinical results. Safe, effective, evidence-proof photothermal boosting treatments are here to stay.

What are the contraindications for using the MCT System?

Contraindications for the MCT System correspond to those of the original biological sample used as the starting material. For example, in the case of MCT Plasma, contraindications are identical to those for standard PRP or any plasma-derived product utilized.

USING THE MCT SYSTEM

Which are the MCT presets and what are they for?

There are 3 individual MCT presets (*PRP, Cells,* and *Exosomes*) each tailored to achieve specific therapeutic goals. *PRP preset* improves platelet performance to achieve better clinical outcomes, *Cells preset* stimulates cell metabolism for superior cell-based therapy results, and *Exosomes preset* induces the release of exosomes, boosting the regenerative power of any product.

What kind of sample material is advised for each MCT preset?

PRP preset is recommended for plasma-derived products, such as PRP (platelet-rich plasma) or PPP (platelet-poor plasma). *Cells preset* is more versatile and can be employed for various cell types, including biopsies, stromal vascular fraction, stem cells, as well as other cell types. *Exosomes preset* is suitable for any biologic liquid containing living cells or platelets.

How should the patient sample be for an MCT treatment?

For MCT Technology to exert its therapeutic effects, autologous material must be liquid and contain living cells or platelets.

Which is the standard MCT protocol?

The MCT protocol involves 3 key steps. First, procuring the autologous material from the patient. Second, inserting the patient's material into the MCT Kit®. Third, setting up the MCT Unit® with the loaded MCT Kit®, running the preferred MCT preset, extracting the MCT material once the session is over, and administering it to the patient.

Can I combine multiple MCT presets to treat the same patient?

Yes. There are 3 different MCT presets (*PRP, Cells, and Exosomes presets*) which can be used individually. However, for a superior outcome we strongly recommend splitting the patient material and combining *PRP or Cells presets* with *Exosomes preset*.

What is a combined MCT treatment?

A combined MCT treatment merges *PRP or Cells presets* with the *Exosomes preset* for enhanced therapeutic results. Patient's material is split in two halves of equal volume. The first half is used for either *PRP or Cells presets* to obtain MCT Plasma or MCT Cells respectively, while the second half is used to run *Exosomes preset* and generate MCT Exosomes. This way the patient receives MCT Plasma or MCT Cells, as well as MCT Exosomes.

What does the *PRP preset* stimulate?

The *PRP preset* enhances platelet performance for improved clinical outcomes. Specifically, the *PRP preset* stimulates platelets with red light and decreases the temperature of the PRP to 4°C. Red light stimulation of platelets has been demonstrated to increase the ATP levels within the platelet, meaning more energy for the platelet and therefore more functionality. Low temperatures, 4°C, have been demonstrated to prime platelet activation and trigger the release of growth factors (VEGF, EGF, and bFGF) from α-granules.

What does the *Cells preset* stimulate?

The *Cells preset* stimulates cell metabolism, yielding superior results in cell-based therapies. In detail, the *Cells preset* photostimulates cells with red and near-infrared light (NIR). This direct exposure of cells to light profoundly affects chromophores, including cytochrome C oxidase and opsins. These light-responsive receptors activate second messengers (ROS, Ca^{2+}, ATP, cAMP, NO), modulating cell signaling pathways.

Which is the recommended starting volume of patient material?

The MCT Kit® allows a maximum of 10 mL. While 10 mL is enough for individual MCT treatments, we recommend an initial volume of 20 mL for combined MCT treatments. These 20 mL can be divided into two 10 mL halves for individual presets.

How long does a session of a combined MCT treatment last?

PRP or Cells presets are first run on the MCT Unit® to obtain MCT Plasma or MCT Cells. While the patient receives MCT Plasma or MCT Cells, *Exosomes preset* can be started to generate MCT Exosomes. By performing these steps simultaneously, the duration of the session can be reduced to 25-30 minutes.

Which is the recommended administration timeline for an MCT treatment?

We recommend scheduling treatment sessions with a 3-week interval and maintaining a span of 4-6 months between subsequent maintenance sessions. While this timeline serves as a general guideline, it is essential to tailor it to the specific needs of each individual patient if necessary. Administration will change depending on the patient, physician's specialty and pathology treated.

Can I reuse the same MCT Kit®?

The MCT Kit® is designed for single-session use and may only be reused during the same session for the same patient, such as in combined MCT treatments. It must never be reused for different patients and cannot be autoclaved or resterilized.

Can any PRP be used with the MCT System?

Yes, the MCT System is compatible with any PRP and other liquid biologic samples containing live cells or platelets.

Is other additional equipment needed besides the MCT Unit® and MCT Kit®?

Only the MCT Unit® and MCT Kit® are necessary. Any PRP kit used to prepare the PRP sample in your clinic is compatible with the MCT System, but we do not sell PRP kits ourselves.

Is there a specific protocol for preparing the PRP sample to be used with the MCT System?

PRP should be prepared following your clinic's standard procedure. However, it is crucial that the PRP remains liquid and inactivated before being inserted into the MCT Kit®. After photothermal biomodulation generated with the MCT Unit®, platelets can be activated according to the doctor's standard protocol.

Are there any restrictions related to the tubes used to prepare PRP, such as tubes with anticoagulants?

It is essential to use PRP tubes containing anticoagulants when preparing PRP to use with the MCT System. Without anticoagulants, platelets in the PRP will initiate the coagulation cascade, causing the PRP sample to solidify.

Is programming required for the MCT Unit® during installation?

No, programming is not required. The MCT Unit® includes three preset programs (*PRP, Cells, and Exosomes*) that can be easily selected via a touchscreen. These presets are pre-configured with specific parameters based on scientific published evidence. Detailed information about each preset is available in the MCT Protocols dossier.

Can I use whole blood with the MCT System?

Inserting whole blood into the MCT System is not recommended. Whole blood contains various cell types, including red blood cells (RBCs) and white blood cells (WBCs), alongside platelets. The primary objective of the MCT System is to photothermally biomodulate platelets, making platelet concentrates such as PRP more suitable to be used with the MCT System.

RBCs when present in PRP samples, can cause inflammation due to hemoglobin release from lysed RBCs. They also increase sample viscosity, making injection and even distribution more challenging. Moreover, damaged or lysed RBCs can trigger immune responses. WBCs in whole blood can lead to inflammatory responses, potentially causing pain, swelling, and tissue damage that counteract PRP's therapeutic benefits. Neutrophils within WBCs may release enzymes and ROS that degrade tissue and interfere with healing processes. For orthopedic and aesthetic applications, minimizing WBCs in PRP formulations is beneficial. This reduction helps mitigate adverse effects and enhances patient outcomes. Standardizing PRP preparation by controlling WBC content ensures consistent therapeutic results, facilitating comparison across studies and clinical practices. *(References: Gupta, A., et al. Red Blood Cells in Platelet-Rich Plasma: Avoid If at All Possible. Biomedicines. 2023.; Szponder, T. et al. Evaluation of Platelet-Rich Plasma and Neutrophil Antimicrobial Extract as Two Autologous Blood-Derived Agents. Tissue Eng Regen Med. 2017.)*

MCT PRODUCTS: MCT PLASMA, MCT EXOSOMES & MCT CELLS

MCT Products

Within which timeframe should the MCT Plasma, MCT Exosomes, and MCT Cells be injected back into the body?

All MCT products (MCT Plasma, MCT Exosomes and MCT Cells) should be injected immediately to maximize its effectiveness. A delay of up to 15 minutes is acceptable but not recommended.

Is swelling or mild edema a normal adverse effect (AE) of MCT Plasma or MCT Exosomes (obtained from PRP) and how should it be handled?

The AEs observed with MCT Plasma and MCT Exosomes obtained from PRP are the same as seen with PRP treatment. Mild swelling may occur after injection, depending on the site of administration and the individual patient's response.

In such cases, the physician should manage the edema or mild swelling as they normally would with a standard PRP treatment. This is usually not a cause for concern, and if handled appropriately, the swelling goes away within a few days.

Is it effective to use MCT Exosomes or MCT Plasma generated using PRP as starting sample in older patients?

Yes, older patients can benefit from MCT Products. While it is true that any drug or treatment may be less effective in older patients due to changes in their pharmacokinetics (absorption, distribution, metabolism, and elimination of drugs) and physiology, this does not mean that such treatments are ineffective.

For plasma-derived concentrates like PRP, it is important to note that platelets have a lifespan of approximately 7-10 days in the bloodstream. During this period, half of the circulating platelets are removed and replaced by new ones produced by megakaryocytes in the bone marrow. Therefore, older individuals do not have "older" platelets compared to younger individuals, as platelet turnover is consistent regardless of age. Consequently, the effectiveness of platelets in PRP should not be diminished simply due to the patient's age. *(Reference: Adler, S.C., et al. Enhancing wound healing with growth factors. Facial Plast Surg Clin North Am. 2002.)*

Are there any factors that can affect the quality of MCT Plasma or MCT Exosomes?

The factors that affect the quality of MCT Plasma or MCT Exosomes obtained from PRP are the same as those influencing the quality of PRP:

- Platelet concentration
- Blood collection and processing technique: proper handling, including centrifugation speed, duration, and processing, can influence platelet yield and functionality.
- Patient's platelet health: conditions or medications (e.g., NSAIDs, aspirin) may impair platelet function, which can affect PRP quality.
- Nutrition and lifestyle: factors like a poor diet, dehydration, or excessive alcohol use can reduce blood quality and thus the effectiveness of PRP.

Can MCT Plasma be used for aesthetic purposes in patients with autoimmune diseases as comorbidities?

Yes, MCT Plasma has been shown to be safe and effective for reducing facial laxity and enhancing rejuvenation in patients with various autoimmune diseases. This is supported by the publication titled "Efficacy of Photo-Thermal-Bioactivated Platelet-Rich Plasma for Skin Biostimulation in Patients not Eligible for Other Medical-Aesthetic Treatment: A Pilot Study." By Hernández, C. & Pinto, H. *Skin Research and Technology*. (2023).

Can the MCT System be used with PRF (Platelet-Rich Fibrin)?

While PRP is produced by mixing a blood sample with anticoagulants, PRF is generated by collecting blood without anticoagulants, allowing natural coagulation. This process forms a fibrin clot, resulting in a gel-like substance. Due to its quicker gelation compared to PRP, we do not recommend using PRF with the MCT System. The gel-like form of PRF would make it very difficult to insert or extract from the MCT Kit®.

Can the MCT System be used with PRGF (Platelet-Rich in Growth Factors)?

It depends on the preparation method of the PRGF. If PRGF is processed without anticoagulants, it cannot be used with the MCT System, as the lack of anticoagulants can lead to plasma solidification within the MCT Kit®. Therefore, it is crucial to ensure that any PRGF intended for use with the MCT System is prepared in a manner that maintains its liquid state.

What are the best cases to choose to achieve the best results for patients and doctors from the first session?

To achieve the best results for both patients and doctors from the initial session, it is crucial to select the most effective cases. Our Before & After dossier presents excellent results of the MCT Treatment in different therapeutic areas, from aesthetic medicine and trichology (e.g., alopecia, neck, facial, hand rejuvenation), clinical dermatology (e.g., rosacea, melanosis), regenerative medicine (e.g., wound healing), gynecology (e.g., vulvar lichen sclerosus).

Which is the best MCT product for alopecia?

Most of our physicians use a combination of MCT Plasma and MCT Exosomes and have very good results. Other physicians have tried MCT Plasma alone and also had good results. A combination of MCT Cells and MCT Exosomes obtained from stem cells from lipoaspirate have also yielded very good results. You can find the information in our Before & After Cases dossier.

Is the MCT System a safe device for the patient?

Yes, the MCT System is designed with patient safety as a top priority.

In the European Union (EU) the MCT System is certified as a Class IIa medical device, meeting stringent regulatory standards. Additionally, the system carries the CE mark, which authorizes commercialization across the EU.

The MCT System also holds various international certifications, including FDA Thai certification, and medical device approvals from regulatory agencies in the United Arab Emirates (UAE), Serbia, UK, Saudi Arabia, Morocco, Philippines, Ukraine, Brazil, and Canada.

To achieve these certifications, the MCT System underwent extensive safety testing and rigorous evaluations, ensuring it complies with all relevant health and safety regulations. These tests confirmed that the MCT System is not only effective but also safe for patient use. The certifications reflect the system's adherence to high safety standards, offering both patients and healthcare providers confidence in its reliability and safety during medical procedures.

When is a combination of MCT Plasma and MCT Exosomes recommended and when is it only one preset recommended?

We always recommend combining both programs but always splitting the initial autologous material and then applying each preset for each half of the product.

The *PRP preset* of the MCT System significantly improves the functioning of platelets, allowing a more sustained release of growth factors stored within their alpha granules. In other words, it prepares the platelets to work better once they are activated. To work better means that platelets release all the growth factors stored inside them and they do so more sustained in time. However, its effect is limited to the lifespan of these growth factors once released from the platelets. Therefore, this translates into faster results but with a shorter duration in time.

The *Exosomes preset* stimulates the release of already formed exosomes within cells or platelets. These exosomes are vesicles that contain biological messengers, including nucleic acids, which exert epigenetic effects on recipient cells. To achieve this epigenetic effect, recipient cells that uptake the exosomes need more time, since it implicates several mechanisms. In order words, the effects with MCT Exosomes are not as immediate as those of MCT Plasma but their duration over time is longer since they induce epigenetic changes.

Basically:

- MCT Plasma: faster effects, shorter duration in time
- MCT Exosomes: slower effects, longer duration in time

Is the MCT Treatment a safe procedure for the patient?

Yes, the MCT Treatment is designed to be safe for patients. It uses photothermal biomodulation, a process that employs light within the visible spectrum. By exclusively using visible light, the MCT System avoids the risks associated with non-visible, ionizing radiation, which is known to potentially cause carcinogenic effects by damaging DNA. This focus on visible light ensures that the MCT Treatment is both effective and safe, providing therapeutic benefits without the harmful effects associated with other forms of radiation.

Additionally, the MCT System only uses autologous cells and platelet preparations. Due to their autologous source, MCT products (MCT Plasma, MCT Exosomes, and MCT Cells) reduce the risk of an immune rejection and allergic reactions as platelets and cells are recognized as "self" by the patient's immune system, as well as posing no risk of disease transmission.

Is MCT Plasma a safe product for the patient?

There are several key points to understand why the MCT Plasma is a safe product:

1. **Platelets lack nuclear DNA:** platelets do not contain a nucleus, and therefore, they lack nuclear DNA that could potentially be damaged by light exposure. While the MCT

System uses visible, non-ionizing light that does not induce DNA damage in any cell, platelets are inherently even safer due to their lack of nuclear DNA. This makes MCT Plasma a highly secure option. *(Reference: Mavragani, IV. et al. Cancers, 2019.)*

2. **Proven safety of PRP therapy:** PRP is widely acknowledged for its safety and efficacy as a therapeutic option. MCT Plasma enhances this standard PRP by optimizing platelet priming, ensuring the full release of growth factors for superior outcomes. This makes MCT Plasma not only a safer choice but also a more effective treatment option. (*Reference: Garraud, O. et al. Front Immunol. 2015.)*

3. **Extensive clinical use of PRP:** PRP has been used extensively in clinical settings for many years, including in patients with cancer, demonstrating that it does not induce cancer in healthy individuals, nor does it worsen the condition of those already suffering from cancer. For instance, a study by Eichler et al. in 2022 examined the long-term oncologic safety of PRP in patients who had undergone chemotherapy for early breast cancer. PRP was applied to wound sites created after the surgical removal of a venous access device, and the study found no cancer recurrence in these areas and no related deaths, proving that PRP is safe even in high-risk oncological patients. *(Reference: Eichler, C. et al. Arch Gynecol Obstet, 2022.)*

4. **Temporary activity of extracellular growth factors:** extracellular growth factors, such as the ones released by MCT Plasma, degrade after 7-10 days. For these growth factors to promote carcinogenesis, a more continuous and prolonged exposure would be required, which does not occur with MCT Plasma, ensuring its safety in therapeutic applications. *(Reference: Adler, S.C., et al. Enhancing wound healing with growth factors. Facial Plast Surg Clin North Am. 2002.)*

5. **Selective response to tumor cells vs. healthy cells:** healthy cells have significantly fewer growth factor receptors, such as EGFR (Epidermal Growth Factor Receptor), compared to tumor cells. For example, normal fibroblasts have between 5,000 and 10,000 EGFR receptors per cell, while tumor cells can have over 400,000 EGFR receptors per cell. This discrepancy explains why even a higher concentration of growth factors does not adversely affect healthy cells, as they lack the receptor overexpression seen in tumor cells. This selective response adds to the safety profile of MCT Plasma. *(Reference: Wee P, Wang Z. Epidermal Growth Factor Receptor Cell Proliferation Signaling Pathways. Cancers. 2017.)*

Is MCT Exosomes a safe product for the patient?

Yes, MCT Exosomes are designed to be safe for patients. The MCT System induces the release of naïve exosomes that are naturally formed within the patient's own cells or platelets, making these exosomes autologous. This means that the exosomes administered during MCT Exosome treatment come directly from the patient's own body, significantly reducing the risk of adverse reactions.

This autologous approach sets MCT Exosomes apart from other exosome or extracellular vesicle products on the market, which may be derived from other humans (allogeneic), animals, or plants (xenogeneic). These non-autologous exosomes can contain a variety of biological components, some of which are unknown and may pose significant safety risks. Because of these concerns, regulatory agencies in the EU and the USA have prohibited the injection of non-autologous exosome-based products, highlighting their potential dangers.

By using exosomes that are naturally produced by the patient's own body, MCT Exosomes offer a safer and more controlled therapeutic option, avoiding the risks associated with non-autologous sources.

Is MCT Cells a safe product for the patient?

The MCT System uses visible non-ionizing light and therefore does not cause any DNA damage to cells, ensuring its safety when used with cells preparates. One cell preparate that is very used with the *Cells preset* of the MCT System are microfiltered mesenchymal stem cells (MSCs) from lipoaspirate. These MSCs concentrates are extremely safe since they are derived from autologous fat tissue (lipoaspirate), reducing the risk of immune rejection and allergic reactions as cells are recognized as "self" by the patient's immune system. Additionally, albeit being stem cells they present a low tumorigenicity risk, since they are more stable and have a lower propensity for uncontrolled growth. For example, the FDA and the EMA permit the use of MSCs from lipoaspirate if they are minimally manipulated, as well as in many other countries such as Japan, South Korea, Canada, etc.

MCT Exosomes

What are exosomes and which role play in cell biology?

Exosomes, sized 30 to 150 nm, are a subtype of extracellular vesicles (EVs) released via endosomal pathways. They carry proteins (cytoskeletal, enzyme, heatshock, nuclear, extracellular matrix), nucleic acids (DNA, mRNA, miRNA), metabolites, amino acids, and lipids. As crucial mediators of intercellular communication, exosomes impact gene regulation, cell survival, proliferation, angiogenesis, wound healing, and metabolic reprogramming.

In what ways do exosomes shape skin dynamics?

Exosomes originating from keratinocytes, fibroblasts, stem cells, and diverse skin cells play a pivotal role in a range of critical functions, spanning from the self-renewal of the epidermis to skin regeneration, hair follicle stem cell proliferation and differentiation, and the modulation of immunological processes crucial for skin homeostasis.

How do exosomes boost dermatological and cutaneous medical aesthetic therapies?

Exosomes, with their unique ability to transfer biological information and promote tissue repair, emerge as a promising strategy for addressing diverse skin disorders. From wound healing to pigmentation regulation, skin rejuvenation, hair loss recovery, and scar remodeling, exosomes hold promise in diverse therapeutic applications.

What are the main distinctions between autologous and non-autologous (allogeneic and xenogeneic) exosomes?

The main distinctive factor among autologous, allogeneic, and xenogeneic exosomes lies in their source. Autologous exosomes originate from cells of the same individual, allogeneic exosomes derive from cells of a different individual of the same species, and xenogeneic exosomes come from cells of a different species.

How do differences between autologous and non-autologous exosomes translate into their clinical application and effects?

Autologous exosomes benefit from immune privilege, while non-autologous exosomes are prone to triggering an immune response in the patient. The resulting immunogenic response contributes to the short-lived nature of heterologous exosomes, limiting their efficacy and therapeutic potential. Safety concerns also arise from the potential risk of cross- or intra-species contamination associated with the use of heterologous exosomes. All these factors position autologous exosomes as a valid medicinal therapeutic option, while heterologous exosomes

are primarily confined to cosmetic applications. More information can be found in our ebook *Bridging the Exosome Gap: Tackling Current Market Challenges*.

What makes MCT Exosomes unique compared to other exosome-related products?

Unlike conventional methods that merely isolate or concentrate exosomes in cosmetic products, our technology goes beyond; it actively stimulates the release of *naïve* autologous exosomes already pre-formed in cells and platelets. This unique approach sets MCT technology apart from other exosome products in the market, positioning MCT Exosomes as a secure, efficient, potent, and reliable therapeutic option.

Can MCT Exosomes be used with laser treatment in the same session?

Yes, MCT Exosomes can be used in conjunction with laser sessions. Here are two examples of clinical cases:

- **Hypopigmentation** caused by vitiligo post-neuralgia of the trigeminal nerve: MCT Exosomes (administered via nappage technique) were combined with short pulsed Nd:YAG laser + super long pulse Nd:YAG laser.
- **Wound healing**: a combined MCT treatment (MCT Exosomes + MCT Plasma) alongside super long pulse Nd:YAG.
- **Diabetic foot ulcering**: MCT Exosomes (topically administered) were successfully used in combination with a phototherapy device (K-Laser Blue Derma).

Clinical results of cases can be found in our Before & After dossier.

At what depth is it best to inject MCT Exosomes?

At the same depth that their initial product is injected. For example, for exosomes obtained from PRP the same depth as PRP, which usually is at 1-3 mm deep to reach superficial layers of the skin for aesthetic treatment, around 4-6 mm deep into the scalp for hair restoration, into the joint space for joint injections, etc.

If we obtain stem cells from the stromal vascular fraction (SVF), can exosomes be derived from them? If so, how do these exosomes differ from those obtained from PRP, particularly in terms of their regenerative properties?

Yes, exosomes can be obtained from the stem cells present in the stromal vascular fraction. The properties of exosomes are highly dependent on their cell of origin, which leads to functional differences between exosomes derived from SVF stem cells and those obtained from PRP.

Both platelet-derived and stem cell-derived exosomes possess regenerative and healing properties. However, their specific functions differ. **Platelet-derived exosomes** are more specialized for immediate responses, such as clot formation, wound healing, and managing inflammation, which makes them effective for short-term tissue repair.

On the other hand, **stem cell-derived exosomes**, including those from SVF, are more suited for long-term tissue regeneration, immune modulation, and broader systemic therapeutic applications. They support sustained healing and can influence cell proliferation, differentiation, and survival, making them very versatile in regenerative medicine.

In summary, while both types of exosomes have regenerative potential, platelet-derived exosomes are optimal for immediate, localized repair, whereas stem cell-derived exosomes are better suited for ongoing tissue regeneration.

If a patient has received Botox or fillers, how long should they wait before a physician can inject MCT Exosomes obtained from PRP?

The physician should do the same as they do with PRP. This is completely up to the physician. It is important to understand MCT Exosomes and MCT Plasma obtained from PRP as an improved version of PRP, but still follow the same regulations/medical applications.

As with PRP, there are no concerns when used alongside botulinum toxin. However, fillers should not be injected in the same area as PRP during the same session. Ultimately, the treatment approach depends on the physician's judgment and the individual needs of the patient.

Which is the best age group for obtaining the highest amount of exosomes from platelets?

There isn't a specific "best age" for obtaining the highest number of exosomes from an individual, as this depends on each person's unique characteristics. However, the most widely accepted concentration range is 70 billion/mL.

Regarding concerns about whether elderly individuals produce fewer extracellular vesicles (EVs), research indicates that they secrete higher levels of EVs. Similarly, several studies analyzing EVs from various body fluids across aging models (including mice, rats, and humans) have yielded inconsistent results concerning the quantity and characteristics of EVs in older versus younger subjects. Some studies report a decrease in EV concentration with age in human plasma (ages 30 to 60) and rat serum (3 vs. 21–23 months). Conversely, other research indicates an increase in EVs in the bodily fluids of older individuals compared to younger ones, such as in human plasma (ages 20 to 30 vs. 80), mice plasma (3 vs. 18–21 months), and human follicular fluid (women under 35 vs. over 38). Additionally, Alberro et al. found that the concentration of human serum EVs was not significantly affected by age when individuals were categorized into adults (20–49 years) and elders (70–104 years). In conclusion, there is no scientific evidence that elderly individuals produce fewer EVs or that their EVs are impaired. Autologous exosomes are the gold standard for safety and effectiveness in the world of medical injectable exosomes.

Are exosomes derived from allogenic "younger" cells better than autologous exosomes?

Many products on the market claim to contain exosomes sourced from newborn cells, including newborn calf umbilical cord blood, umbilical cord-derived MSCs, placental MSCs, amniotic fluid, umbilical cord tissue, and placenta. Since these exosomes originate from other humans or newborn calves, they share the same limitations as any non-autologous exosomes:

- **No immune compatibility**
- **Risk of disease transmission**
- **Poor safety and efficacy profiles**
- **Cargo uncertainty,** leading to unpredictable biological effects, altered cellular signaling, off-target effects, and potentially dangerous interactions with the patient's genetic material.

On top of that, these exosomes´ products are classified as **cosmetics** and **cannot be injected**, limiting their efficacy to the stratum corneum and epidermis, without reaching the dermis. Therefore, it is absurd to compare them to autologous exosomes, regardless of claims about their 'younger' sources. They remain **non-autologous** and are **not a Medical Device**.

MCT Plasma

What differentiates MCT Plasma to standard PRP?

MCT technology elevates standard PRP to MCT Plasma, enhancing growth factor release, refining platelet activation, reducing proinflammatory cytokines, optimizing pH balance,

decreasing plasma density for a more comfortable injection, and stimulating platelet metabolism via ATP synthesis.

How can I suggest MCT Plasma to my patients?

The best approach is to let them know that there is a new, enhanced regenerative product that is much stronger than standard PRP. It is a new generation top tech treatment that is called MCT Plasma and will lead them to better results in fewer sessions.

Does the presence of gel or hyaluronic acid in the plasma separation tube affect the quality of the plasma when inserted into the MCT System?

Our doctors use various PRP kits, and none have reported any impact of gel or hyaluronic acid within the PRP when then used with the MCT System.

Is it possible to reinject the plasma treated with the MCT device intravenously to the same patient?

We do not recommend injecting plasma treated with MCT intravenously to the patient. The effectiveness and safety of this practice has not been demonstrated.

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