

RegenBCT 10mL: Platelets in 5-6 mL PRP Yield

1.2 to 3.6 billion platelets

RegenBCT 20mL: Platelets in 10-12 mL PRP Yield

2.4 to 7.2 billion platelets

RegenTHT 10mL: Platelets in 5-6 mL PRP Yield

1.42 to 4.27 billion platelets

RegenTHT 20mL: Platelets in 10-12 mL PRP Yield

2.85 to 8.55 billion platelets

**Platelet Counts**

Providers are more frequently asking about total platelet counts. The experts in the field of regenerative medicine agree that a better way of comparing the platelet recovery of various PRP preparations should be using a concentration factor instead of precise platelet counts.

The main reason for this is because a healthy patient can have a circulating platelet concentration that runs anywhere from 150,000 plt/microliter to 450,000 plt/microliter. Therefore, depending on the patient, absolute platelet counts can vary quite a bit.

However, a concentration factor of platelets will always be relative to the patient's baseline circulating platelet count, and therefore provides a better method of comparing platelet recovery efficiency of one patient's PRP preparation to another's.

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*Platelet Counts for Healthy Patients:*

*150,000 plt/microliter – 450,000 plt/microliter*

**OR**

*150,000,000 plt/mililiter – 450,000,000 plt/mililiter*

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**Scale**

1 Liter (L) = 1,000 milliliters (mL) = 1,000,000 microliters (uL)

1mL = 1cc

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**RegenBCT**

Blood Draw: 10mL // Platelet Recovery 80%

With RegenBCT we are drawing 10mL of a patient's circulating venous blood volume. Assuming the patient is healthy, and given the normal healthy range for circulating platelet concentration, we can calculate the number of platelets in that patient's 10mL blood draw.

If the patient has a low-end-of-normal circulating platelet concentration (150,000,000 plt/mililiter):

$10\text{mL} \times 150,000,000 = 1.5$  billion platelets collected.

However, the RegenBCT PRP preparation technology recovers 80% platelets. If there was a higher percentage recovery of platelets it would be impossible to achieve such a high elimination rate of red blood cells (99.7% elimination), and such a high elimination of pro-inflammatory granulocytes “bad white blood cells” (96% elimination).

Therefore, of the 1.5 billion platelets collected in the 10mL blood draw, 80% of these will be in the final 5-6 milliliters of PRP that is yielded from centrifugation. The other 20% will be lost beneath thixotropic.

$1.5$  billion  $\times 0.80 = 1.2$  billion platelets in the final 5-6 mL of PRP

Now, if that patient had a high-end-of-normal circulating platelet concentration (450,000,000 plt/mL):

$10\text{mL} \times 450,000,000 \times 0.80 = 3.6$  billion platelets in the final 5-6 mL of PRP

### **RegenBCT**

Blood Draw Volume: 20mL // Platelet Recovery 80%

Low end of normal:  $20\text{mL} \times 150,000,000 \times 0.80 = 2.4$  billion platelets in the final 10-12 mL of PRP

High end of normal:  $20\text{mL} \times 450,000,000 \times 0.80 = 7.2$  billion platelets in the final 10-12 mL of PRP

### **RegenTHT**

Blood Draw Volume: 10mL // Platelet Recovery 95%

The RegenTHT is designed to also capture 70-80% of Mononuclear cells, which means that the gel has been calibrated to be denser than 70-80% of the MNCs. As a result, the granulocyte elimination is about 90% and the RBC elimination is about 99.0%, which is still very good. Another benefit is that now 95% of the platelets will be recovered, and only 5% will be lost beneath the gel.

Low end of normal:  $10\text{mL} \times 150,000,000 \times 0.95 = 1.42$  billion platelets in the final 5-6 mL of PRP

High end of normal:  $10\text{mL} \times 450,000,000 \times 0.95 = 4.27$  billion platelets in the final 5-6 mL of PRP

### **RegenLab 20mL THT**

Blood Draw Volume: 20mL // Platelet Recovery 95%

Low end of normal:  $20\text{mL} \times 150,000,000 \times 0.95 = 2.85$  billion platelets in the final 10-12 mL of PRP

High end of normal:  $20\text{mL} \times 450,000,000 \times 0.95 = 8.55$  billion platelets in the final 10-12 mL of PRP

## Concentration Factor

For any given patient, their circulating platelet concentration defines that patient's platelet concentration baseline of **1.0X**.

So, let's say we have a patient with a mid-range healthy platelet concentration of 300,000,000 plt/mL.

With a BCT we would draw 10mL of blood, containing a total of 3 billion platelets. (10mL x 300,000,000 plt/mL)

Let's say the patient's PRP preparation yield 5mL of PRP. We know that the technology will keep at least 80% of the 3 billion platelets in the PRP treatment layer.

$3,000,000,000 \times .80 = 2.4$  billion platelets captured in the 5mL of PRP

Now, if we divide the number of platelets by the volume of PRP they are contained in, we can find the concentration of platelets per mL of PRP.

$2,400,000,000 / 5\text{mL} = 480,000,000$  platelets per mL of PRP

So this patient's baseline circulating platelet concentration of 300,000,000 platelets per mL of whole blood (this particular patient's baseline platelet concentration) can be thought of as **1.0X** concentration.

Now, their 5mL of PRP has a platelet concentration of 480,000,000 platelets per mL.

Therefore, we see that the concentration factor is **1.6X**

( $300,000,000 \times 1.6 = 480,000,000$ )

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## Increasing Concentration

With RegenLab technologies, it is possible to remove up to 2/3 of the platelet-poor-plasma layer before the resuspension step. This means that there will be less total volume of PRP, but the total number of platelets will not change. However, the platelet concentration factor will change dramatically.

For example, if we took a RegenLab BCT device and processes 20mL of whole blood. This time, let's say we have a patient with a circulating platelet concentration at the high-end-of-normal (450,000,000 plt/mL). That is, this patient's baseline platelet concentration is 450,000,000 plt/mL and that defines this patient's platelet concentration factor of **1.0X**

$20\text{mL} \times 450,000,000 \text{ plt/mL} = 9$  billion platelets collected

$20\text{mL} \times 450,000,000 \text{ plt/mL} \times 0.80 = 7.2$  billion platelets recovered

Let's say the initial yield was 10mL, that is there are 7.2 billion platelets ready to be resuspended in the plasma. But before resuspension, the physician removes 7mL of PPP because they only need 3mL of

injectate. After this removal, and with the performance of resuspension, there will now be 7.2 billion platelets in 3mL of plasma volume.

$7,200,000,000 / 3\text{mL} = 2.4$  billion platelets per mL

Initially this patient had 450,000,000 platelets per mL of their circulating volume

Now, their PRP treatment has 2.4 billion platelets per mL of PRP

$2,400,000,000 / 450,000,000 =$  Concentration Factor **5.3X**