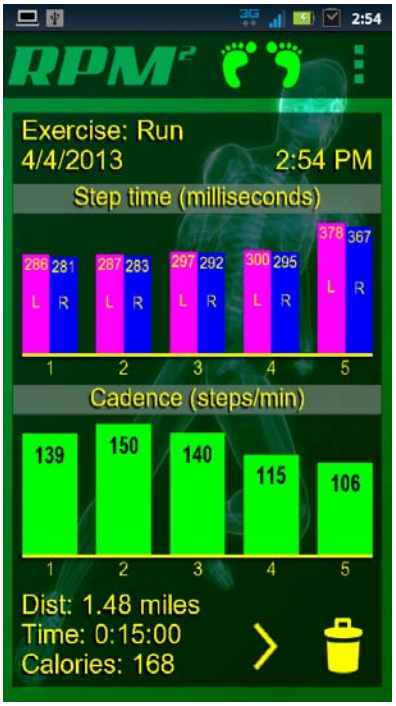
How to read Dashboard Reports

The premise behind RPM$^2_{TM}$ is to assess bi-lateral equivalence of the lower limbs. It has long been understood that bi-lateral equivalence is the key to improved athletic performance. Until now, technology to assess or measure this type of information has not been available; thus, coaches, trainers, and athletes have had to rely on subjective and anecdotal training techniques without the benefit of objective and evaluative data. RPM$^2_{TM}$ technology measures bi-lateral equivalence and as we all know, athletes whose legs are bi-laterally in sync are faster, stronger, and perform at a higher level.

The pre-determined range of motion, pressure, and gait exercises on the RPM$^2_{TM}$ app are specifically designed to ***test*** for bi-lateral equivalence. Although, these test exercises can be used as actual training exercises, it is recommended that training is augmented based on the values measured by RPM$^2_{TM}$; thus, coaches, trainers, and athletes can make adjustments to strength and conditioning exercises to ensure bi-lateral equivalence.

For best results, and longevity of the RPM$^2_{TM}$ device, it is recommended that tests are performed once per week. By doing so, it is easier to determine how adjustments to strength and conditioning exercises help to correct gait, range of motion, and pressure of the athlete. Additionally, this allows for complete customization of the training regimen to enhance performance, which can be adjusted based on the latest measurement points provided by the RPM$^2_{TM}$ system.

It is also recommended that the five range of motion and pressure ***test*** exercises are performed either before or after the run, 100 yard dash, or cycling (if applicable) ***test*** exercises. This will provide complete gait, pressure, and range of motion data that coaches, trainers, and athletes will use to adjust strength and conditioning exercises.



Run Gait

The running gait dashboard shows 5 separate gait analysis segments. Each segment measures 10 seconds of run time. There are 4 main measured data points. Step Time, Cadence, Pace and Pressure. You will also see the total distance in miles, total time and calories burned during a run. The reason RPM^2_{TM} measures 5 separate segments of the run is to provide beginning, 3 mid points, and end run measurements. This provides a clear track record of how gait and pressure are either holding up or breaking down during the run. If legs are not bi-laterally equivalent, gait, cadence, pace, and pressure are affected which hinder an athletes' ability to perform at a higher level.

Goal

The goal is to achieve bilateral equivalence of the legs. If bilateral equivalence is not achieved, the athlete may not be performing at the highest level, thus, gait dashboards specifically measure for bilateral equivalence during the run.

Step Time

Step Time is measured in milliseconds and the report contains 5 sets of 2 vertical bars. Each set of 2 bars represents right verse left leg comparisons. The reason 5 sets are measured is to map how gait (step time) is either holding up or breaking down during the duration of the run.

Goal

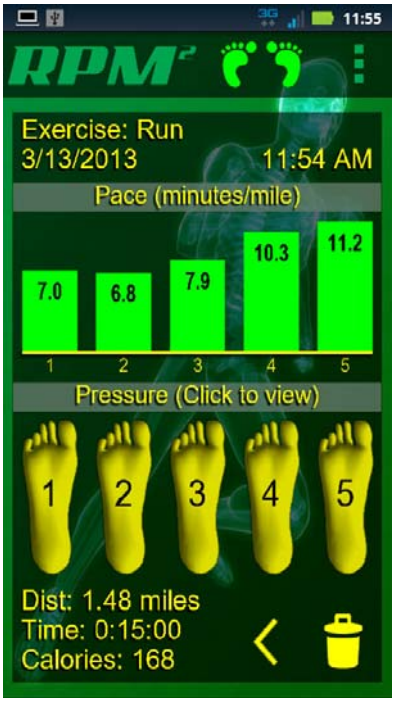
The goal is to have left verse right step time equal in each segment throughout the duration of the run. If step time is increasing throughout the run, either unilaterally or bi-laterally, this means gait is breaking down most likely due to fatigue and/or improper mechanics.

Cadence

Cadence simply measures steps per minute.
The cadence analysis is measured in parallel with the step time analysis; therefore there are 5 vertical bars each containing a number that represents cadence in steps per minute.

Goal

The goal is to maintain the same cadence throughout the duration of the run. If cadence decreases over the duration of the run, this is most likely due to fatigue and/or improper mechanics.



Pace

Pace is simply measured in minutes per mile.
Pace is measured in parallel with step time and cadence analysis; therefore you will find 5 vertical bars each containing a number that represents minutes per mile pace. If pace decreases over the duration of the run, it is most likely due to fatigue/or improper mechanics which is linked back to Step time and Cadence

Goal

The goal is to at least maintain the same pace throughout the duration of the run**.**

Running Pressure

Running pressure/force also looks at 10 seconds of run time, five times during the run. Clicking on the feet icon shows lighted areas where pressure is applied. The corresponding number values at the bottom of the screen shot provide the relative force applied to each quadrant of the foot.

Goal

The goal of this screen is to provide the athlete multiple views of how pressure/force changes throughout the run. Pressure/force migrating throughout the run is an indicator of the breakdown of mechanics; thus, allowing for strength and conditioning training adjustments to correct any problems that may occur.

100 Yard Dash Gait

Unlike the Run Gait analysis, the 100 yard dash gait monitors gait of an athlete in full stride for 6 seconds. RPM^2$_{TM}$ begins measurement at the 2 second mark and continues to measure until the 8 second mark. The premise behind this is that runners will be in full gait within two seconds of the run and will continue to be in full gait through 10 seconds; thus, only full gait is captured. The dashboard will show two vertical bars for left and right leg step time. Additionally, the dashboard shows one foot imprint. By clicking on the foot imprint, the screen shot changes to show lighted areas of pressure during the run. Four quadrant pressure/force sensing is depicted at the bottom of the screen.

Goal

The 100 yard dash gait analysis specifically looks at gait when speed is of utmost importance. Again, if symmetry is not achieved, the athlete is not performing at the highest level.

5 ROM (Range of Motion) Exercises

Toe Raise Dashboard

The Toe Raise Range of Motion exercise (ROM) depicted in this dashboard is to determine bilateral equivalency of the ankles.

Goal

The goal is for the left and right ankle to be bilaterally equivalent. Bilateral equivalency is determined by performing 20 repetitions with each ankle. Based on the data obtained, 2 pie charts are generated with the pivot point at the ankle. The greater the angle achieved, the more range of motion you have. If one ankle does not have the ROM as the other, and there are no medical defects, continuous ROM exercises can improve ankle ROM.

Below the picture of the ankle you will find average and maximum degrees of ROM.

Knee Extension

The Knee Extension Range of Motion exercise (ROM) depicted in this dashboard is to determine bilateral equivalency of the knee.

Goal

The goal is for the left and right knee to be bilaterally equivalent. Bilateral equivalency is determined by performing 20 repetitions with each knee. Based on the data obtained, 2 pie charts are generated with the pivot point at the knee. The greater the angle achieved, the more range of motion. If one knee does not have the ROM as the other, and there are no medical defects, continuous ROM and strength and conditioning exercises can improve knee ROM.

Below the picture of the knee you will find average and maximum degrees of ROM

Hip Extension

The Hip Extension Range of Motion exercise (ROM) depicted in this dashboard is to determine bilateral equivalency of the Hip.

Goal

The goal is for the left and right hip to be bilaterally equivalent. Based data obtained, 2 pie charts are generated with the pivot point at the hip moving backwards. The greater the angle achieved, the more range of motion achieved. If one hip does not have the ROM as the other, and there are no medical defects, continuous ROM and strength and conditioning exercises can improve hip ROM.

Below the picture of the hip you will find average and maximum degrees of ROM.

Hip Flexion

The Hip Flexion Range of Motion exercise (ROM) depicted in this dashboard is to determine bilateral equivalency of the Hip.

Goal

The goal is for the left and right hip to be bilaterally equivalent. Based on the data obtained, 2 pie charts are generated with the pivot point at the hip moving forward. The greater the angle, the more range of motion achieved. If one hip does not have the ROM as the other, and there are no medical defects, continuous ROM and strength and conditioning exercises can improve hip ROM.

Below the picture of the hip you will find average and maximum degrees of ROM.

Half Squat

The Half Squat exercise looks at weight distribution in 4 quadrants of the foot. Additionally, this exercise shows weight distribution comparing left to right leg which is directly related to bilateral equivalence.

Goal

The goal of 4 quadrant pressure sensing is to have equal pressure on each of the sensors within the insert of each foot. Within the picture of the foot, there are 4 pressure circles (4 quadrants) and each has a pie chart based on the amount of pressure placed on each sensor in each quadrant. Below the pictures of the feet you will find eight numbers, 4 for the left foot and 4 for the right foot. These numbers show the percentage of pressure applied to each quadrant in the foot as depicted in the picture. All though there is no picture showing left to right leg weight distribution, the numbers below the picture represent left to right weight distribution and should equal 100%. The goal is to have as close to 50 percent weight distribution between the left and right legs.

If one leg is exerting more pressure than the other, this could be due to right or left leg dominance and should be corrected if no medical defect or injury is present.

Bicycling Pressure

The Bicycling Pressure dashboard shows 5 separate cycling pressure/force segments. Each segment measures 10 sec of cycling time. There are 2 main measured data points, which are left verses right leg force distribution. Additionally, RPM^2_{TM} measures left to right force exerted on each pedal determining whether the cyclist is pronating or supinating. This screen also shows total distance in miles, total cycle time and calories burned during the ride.

Goal

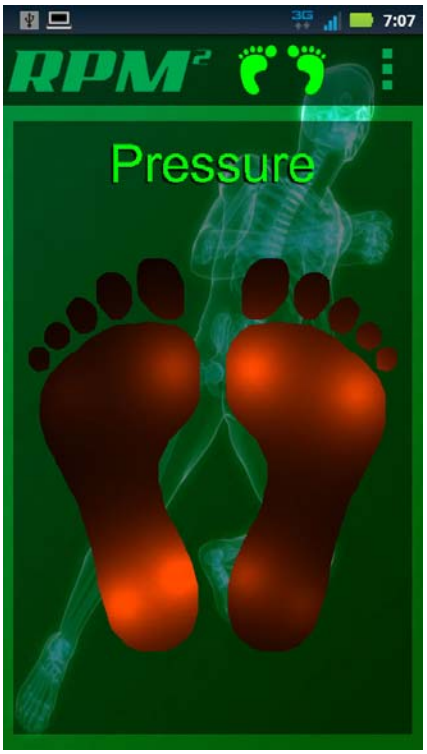
The goal is to maintain bilateral equivalence left leg to right leg. If you are not bilateral equivalent you are not performing at optimal potential. This dashboard specifically measures for bilateral equivalence

Standing Pressure

Standing pressure is a one minute (timed) test specifically geared to measure right verses left leg pressure/force. In addition to right verses left leg measurements, RPM2 also measures pressure on four quadrants of the foot. Although a simple test, standing pressure shows how an athlete stands, which can ultimately have impact on gait and bi-lateral equivalence.

Goal

The goal is to achieve bi-lateral equivalence left to right leg, as well as symmetry within the four quadrants of the foot.



Real Time Pressure

The real time pressure feature was added so athletes can assess how they are applying pressure/force left verse right leg, or within the four quadrants of the foot at any given time.

Goal

The goal is to allow athletes to continuously work on bi-lateral force distribution in real time. In doing so, the athlete can make immediate adjustments to how they stand, which can be carried over to standing pressure when the RPM^2_{TM} system is not in use.