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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

ROB DUNN, Individually and on Behalf of All Others Similarly Situated,

Plaintiff,

v.

FITBIT, INC.,

Defendant.

Case Nos. 16-cv-00036-JD; 16-cv-00777-JD

THIRD AMENDED CONSOLIDATED MASTER CLASS ACTION COMPLAINT

JURY DEMAND

Ctrm: 11, 19th Floor

The Honorable James D. Donato

TABLE OF CONTENTS

INTRODUCTION

1. In widespread national advertising, Defendant Fitbit, Inc. ("Fitbit") touted the purported ability of its wrist-based "activity trackers" to accurately record a wearer's heart rate during intense physical activity. To perform this function, Fitbit equipped its "Charge HR," "Surge," and "Blaze" fitness watches (the "PurePulse Trackers") with an LED-based technology called "PurePulse™."

2. Fitbit's representations are repeated in and echoed throughout its advertising of the PurePulse Trackers—including, for example, in commercials run repeatedly during Major League Baseball's nationally-televised 2015 World Series[1]—which employs such descriptive slogans as "Every Beat Counts" and "Know Your Heart." But those representations are false. Far from "counting every beat," the PurePulse Trackers *do not* and *cannot* consistently and accurately record wearers' heart rates during the intense physical activity for which Fitbit expressly markets them.

3. Plaintiff Rob Dunn ("Plaintiff") and many consumers like him have observed that the PurePulse Trackers consistently mis-record heart rates by a very significant margin, particularly during exercise (described herein as the "Heart Rate Defect").

4. Expert testing confirms these observations. Professors from California State Polytechnic University, Pomona ("Cal Poly Pomona") conducted far and away the most comprehensive study to date, and found that Fitbit's PurePulse Trackers are inaccurate by an average of approximately 20 bpm during moderate to high intensity exercise. They therefore concluded that the devices could not provide meaningful heart rate data. Additional, independent reviewers have reached the same conclusion.

5. This failure did not keep Fitbit from heavily promoting the heart rate monitoring feature of the PurePulse Trackers and from profiting handsomely from it. In so doing, Fitbit defrauded the public and cheated its customers, including Plaintiff.

6. The heart rate monitoring function of the PurePulse Trackers is a material—indeed, in some cases, vital—feature of the product. Not only are accurate heart readings

[1] Available at https://www.youtube.com/watch?v=x0Ok-EgCHjc (last visited June 18, 2018).

important for all those engaging in fitness, they are critical to the health and well-being of those Class members whose medical conditions require them to maintain (or not to exceed) a certain heart rate.

7. Plaintiff brings this action on behalf of himself and all those who purchased the Fitbit PurePulse Trackers and who opted out of the arbitration clause in Fitbit's Terms of Service to seek redress through this proposed class action in the form of injunctive relief, damages, restitution, and all other relief this Court deems equitable.[2]

JURISDICTION AND VENUE

8. Jurisdiction is proper in this Court pursuant to the Class Action Fairness Act ("CAFA"), 28 U.S.C. § 1332(d), because many members of the proposed Plaintiff Class, including Plaintiff Dunn, are citizens of states different from Fitbit's home states, and the aggregate amount in controversy exceeds $5,000,000.00, exclusive of interest and costs. As this Court previously concluded, "jurisdiction was established under CAFA at the time the complaint was filed and is not defeated by post-filing developments." Dkt. 125 (citing *Rea v. Michaels Stores Inc.*, 742 F.3d 1234, 1237 (9th Cir. 2014); *Visendi v. Bank of Am., N.A.*, 733 F.3d 863, 868 (9th Cir. 2013)).

9. Jurisdiction is also proper pursuant to 28 U.S.C. § 1332 because the amount in controversy, including the requested injunctive relief applicable to all putative Class members, exceeds $75,000, and Plaintiff and Defendant are citizens of different states.

10. Venue is proper in this Court pursuant to 28 U.S.C. § 1391 because (1) the only defendant in this action resides in this District and (2) a substantial part of the events and omissions giving rise to Plaintiff's claims occurred in this District—specifically, Fitbit designed

[2] Plaintiff Dunn asserts, and has argued, that he can represent a class of *all* consumers who purchased a PurePulse Tracker, as defined herein, whose contractual arbitration opt-out period had not expired when the class action complaint was filed. *See, e.g.*, Dkt. 133 at 1-2, 8-11 The Court subsequently granted Fitbit's motion to strike class allegations for non-opt-out consumers "without prejudice" and "subject to reconsideration if warranted by future developments." Dkt. 141. Plaintiff maintains that the contractual period for absent class members to opt out of arbitration remains tolled until those class allegations are dismissed with prejudice, and reserves all rights and arguments related to this issue.

and marketed its product from its headquarters in San Francisco, California, and some Class members reside in and purchased their PurePulse Trackers in this District.

11. The Court has general personal jurisdiction over Defendant Fitbit, Inc., whose headquarters is located in San Francisco, California.

INTRADISTRICT ASSIGNMENT

12. Pursuant to Local Rule 3-2(c), this civil action has been assigned to the San Francisco Division, because a substantial part of the events or omissions giving rise to the claim occurred in the county of San Francisco, where Fitbit is headquartered.

PARTIES

13. Plaintiff ROB DUNN is an Arizona citizen and resident domiciled in Yuma, Arizona. Plaintiff Dunn is also a fitness enthusiast. In late 2015, Mr. Dunn heard from his wife that Fitbit was selling a fitness watch that purported to track heart rate. He was initially skeptical, but began researching the product online, including on Fitbit's website. There, he viewed and relied on Fitbit's many representations that that the PurePulse Trackers could record real-time heart rate, even during exercise. Mr. Dunn then visited a Bed Bath & Beyond store in Yuma, Arizona, on December 26, 2015. There, he spoke to a sales representative about the Charge HR, compared the Charge HR to the Charge (the comparable version without heart rate monitoring), viewed and relied upon Fitbit's representations on the Charge HR product packaging —including statements that the device provided "Heart Rate," "CONTINUOUS HEART RATE," "PUREPULSE CONTINUOUS HEART RATE," "Automatic, 24/7 wrist-based heart rate," and "Continuous workout heart rate"—and then purchased the product.[3] Later that day, he purchased another Charge HR for himself at a Best Buy, also in Yuma, Arizona. At no point before or during the purchase of either Charge HR was Plaintiff Dunn or his wife provided with or required to agree to an arbitration clause or class action ban, nor were they put on notice that they would be required to agree to an arbitration clause or class action ban for their PurePulse Trackers to function as intended. Soon after purchasing the Charge HR, Plaintiff Dunn noticed the heart rate

[3] The packaging of the products that Mr. Dunn purchased was substantially similar, if not identical, to the packaging described and displayed in ¶ 30, *infra*.

function did not work as represented. During exercise, his PurePulse tracker returned inconsistent and inaccurate readings, often recording well below (and occasionally well over) the readings from the heart rate monitors on his stationary cardiovascular machine. Had Fitbit disclosed that the PurePulse Trackers cannot consistently deliver accurate heart rate readings, even during exercise, Plaintiff Dunn would not have purchased his Charge HR or would have paid significantly less for it. Plaintiff Dunn is now stuck with a PurePulse Tracker that cannot perform the precise task for which he purchased it and which does not function as Fitbit expressly promised and warranted. On January 15, 2016, twenty days after they registered for accounts on Fitbit.com, Plaintiff Dunn and his wife opted out of the arbitration provision in the Terms of Service purportedly governing the use of their PurePulse Trackers.

14. The remaining plaintiffs named in the Amended Consolidated Master Class Action Complaint (Dkt. 42) have been ordered to arbitrate the enforceability and applicability of their purported agreement to arbitrate their claims with Defendant Fitbit, Inc., and, if that agreement is found to be enforceable and applicable, to arbitrate the merits of their claims. *See* Dkts. 114, 126 (the "arbitration orders"). Those plaintiffs' claims have not been dismissed, however. Thus, the arbitration orders are interlocutory orders "directing arbitration to proceed" or "compelling arbitration" and are not yet appealable under 9 U.S.C. § 16, barring certification pursuant to 28 U.S.C. § 1292(b). These plaintiffs reserve the right to file an appeal at the appropriate time.

15. Defendant Fitbit, Inc. is a corporation doing business in all 50 states. Fitbit designs, manufactures, promotes, and sells the PurePulse Trackers described herein. Fitbit is organized and incorporated under the laws of Delaware, and its principal place of business is in San Francisco, California. It is therefore a citizen of Delaware and California. *See* 28 U.S.C. § 1332(c)(1).

COMMON FACTUAL ALLEGATIONS

16. Fitbit is a manufacturer of activity trackers founded in 2007 and headquartered in San Francisco, California. Its products' functions have included, among other things, step counting, distance calculating, calorie calculating, and sleep monitoring.

17. In October 2014, Fitbit announced a new feature: wrist-based heart rate monitoring. The two products first equipped with this technology, dubbed PurePulse, were the Charge HR and Surge, which were released January 2015 and initially retailed at approximately $150[4] and $250 respectively. In March 2016, Fitbit released a third PurePulse Tracker, the Blaze, which retails for approximately $200. All three products are shown below:

I. Fitbit Falsely Claims the PurePulse Trackers Consistently Record Accurate Heart Rate.

18. Heart rate monitoring is an important feature for exercisers. Among other things, it can help users achieve and maintain proper intensity, measure effort, track progress, and stay motivated. And for those with certain health conditions, monitoring one's heart rate can be essential to staying safe. Traditionally, however, accurate heart rate monitoring required a chest strap, which can be uncomfortable, distracting, difficult to clean, and may not work with dry skin.

19. Fitbit attempted to circumvent these problems with its wrist-based PurePulse technology, which it expressly contrasts with "uncomfortable" chest straps.

20. Per Fitbit's promotional materials, PurePulse uses LED lights to detect changes in capillary blood volume. It then applies "finely tuned algorithms" to "measure heart rate automatically and continuously" and allow users to "accurately track workout intensity."[5]

[4] In contrast, the Charge model without a heart rate monitor originally retailed for approximately $130, and has been available for as low as $90.

[5] Previously available at: http://help.fitbit.com/articles/en_US/Help_article/Heart-rate-

Footnote continued on next page

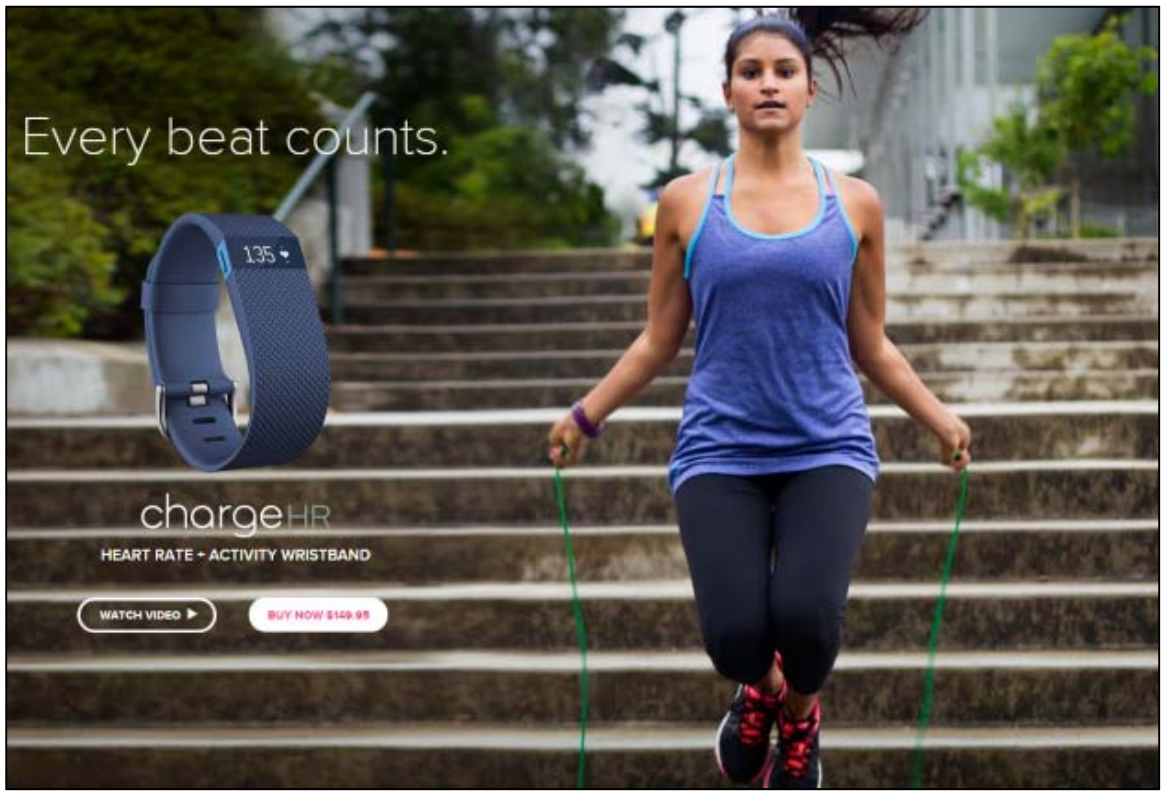
21. Unsurprisingly, the feature is the centerpiece of Fitbit's promotional efforts. The widely-circulated advertisements include slogans like: "The Difference Between Good and Great…Is Heart"; "For Better Fitness, Start with Heart"; "Get More Benefits with Every Beat—Without An Uncomfortable Chest Strap"; "Know Your Heart"; and, most egregiously, "Every Beat Counts."

22. These representations feature in an extensive and widespread advertising campaign. As noted, the "Know Your Heart" commercial, for example, appeared prominently throughout Major League Baseball's nationally-televised 2015 World Series, which averaged 14.7 million viewers per game.

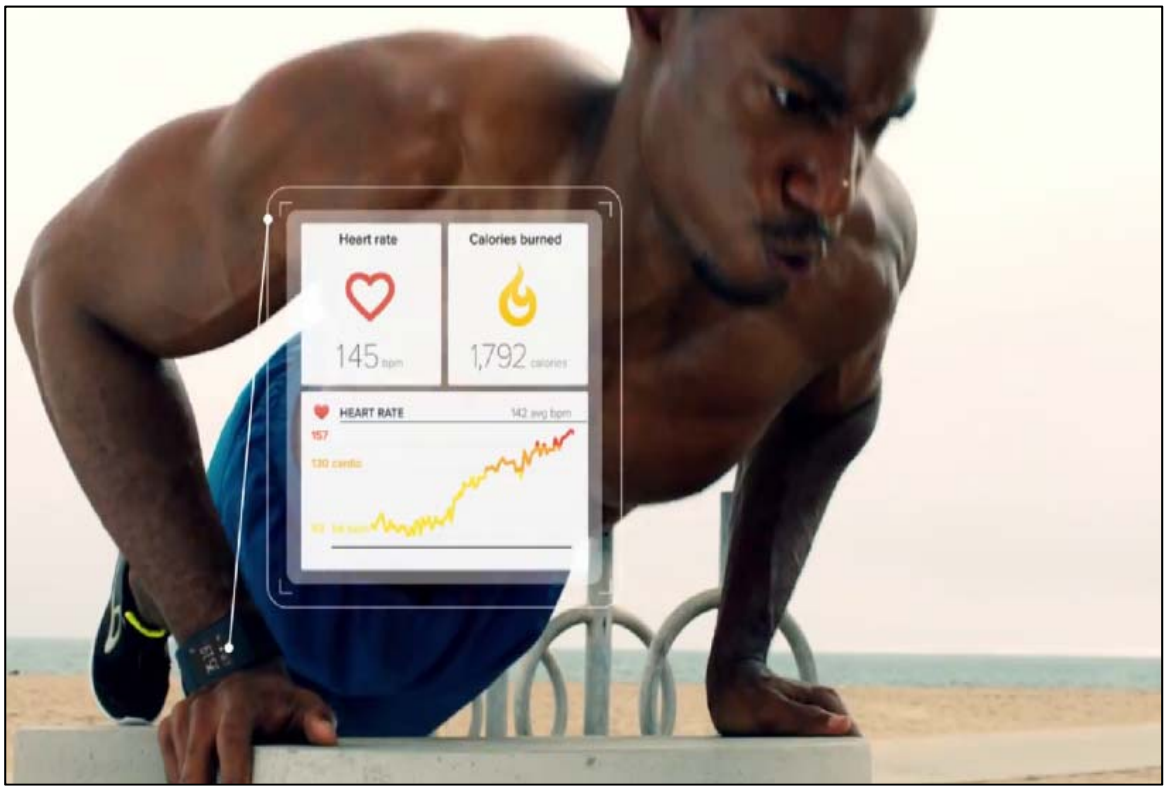
23. Importantly, these advertisements and product descriptions do not state or even remotely suggest that the PurePulse technology works only at low or resting heart rates. To the contrary, Fitbit expressly markets the PurePulse Trackers for activity and fitness, and depicts them in use during high-intensity workouts.

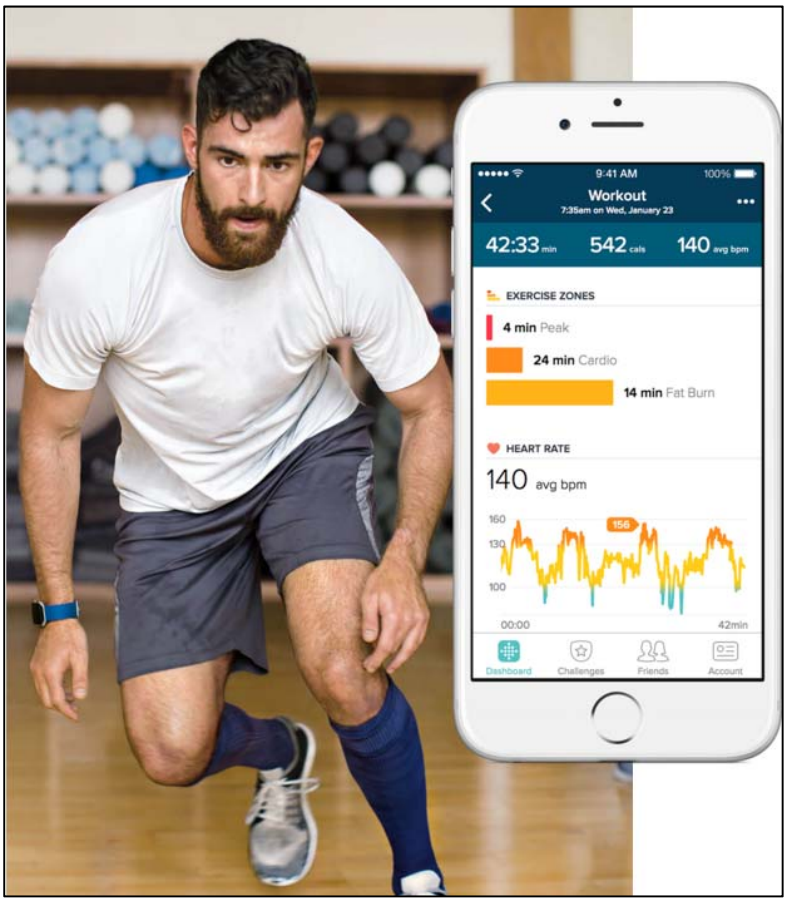
24. The following advertisement, for example, shows a user wearing a Charge HR and jumping rope. That, combined with the elevated heart rate shown on the featured device—135 bpm—and the tag line's promise that "Every beat counts," indicates that the product accurately records every beat, even during high-intensity exercise.

Footnote continued from previous page
FAQs#How.



25. Similarly, the following commercial and website screenshots purport to show the PurePulse Trackers delivering real-time, elevated heart rate readings during strenuous activity:

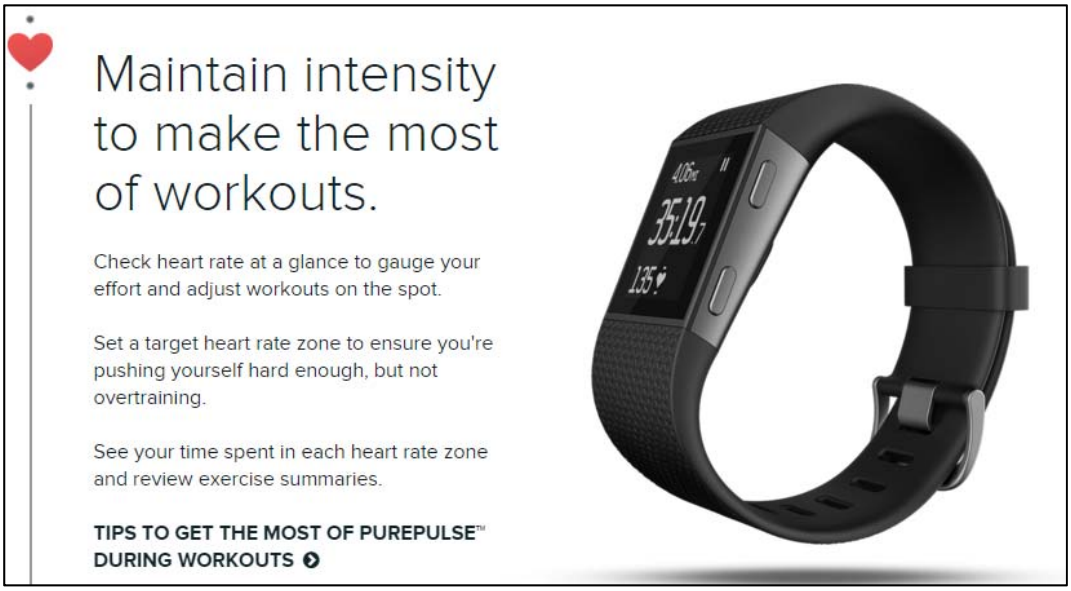




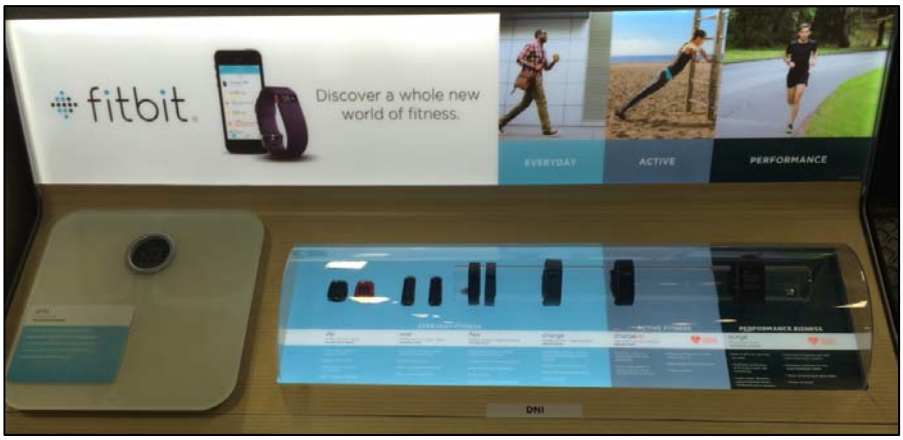
26. In addition, the following promotional materials from Fitbit's website tout the PurePulse Trackers' ability to monitor "real-time heart rate" at intensity, to "track[] your heart rate all day and during exercise," promises users the ability to "[c]heck heart rate at a glance to gauge your effort and adjust workouts on the spot."

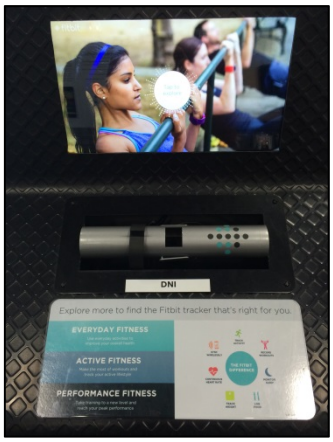

The Perks of PurePulse™
GET MORE BENEFITS WITH EVERY BEAT—WITHOUT AN UNCOMFORTABLE CHEST STRAP
MONITOR CALORIE BURN
Accurately track calorie burn all day and during exercise to stay in control of your weight.
MAINTAIN INTENSITY
Check real-time heart rate to ensure you're working out at the right intensity.
MAXIMIZE TRAINING
Use simplified heart rate zones to tailor your workouts on the spot and make the most of training time.
OPTIMIZE HEALTH
See when your health is improving by analyzing your all-day and resting heart rate trends.


Surge 101
146
130
118
110
92
70
Heart rate
Surge tracks your heart rate all day and during exercise.
See your heart rate on display. When you exercise, the heart icon shows which zone you are in.
In Peak zone
In Cardio zone
In Fat Burn zone

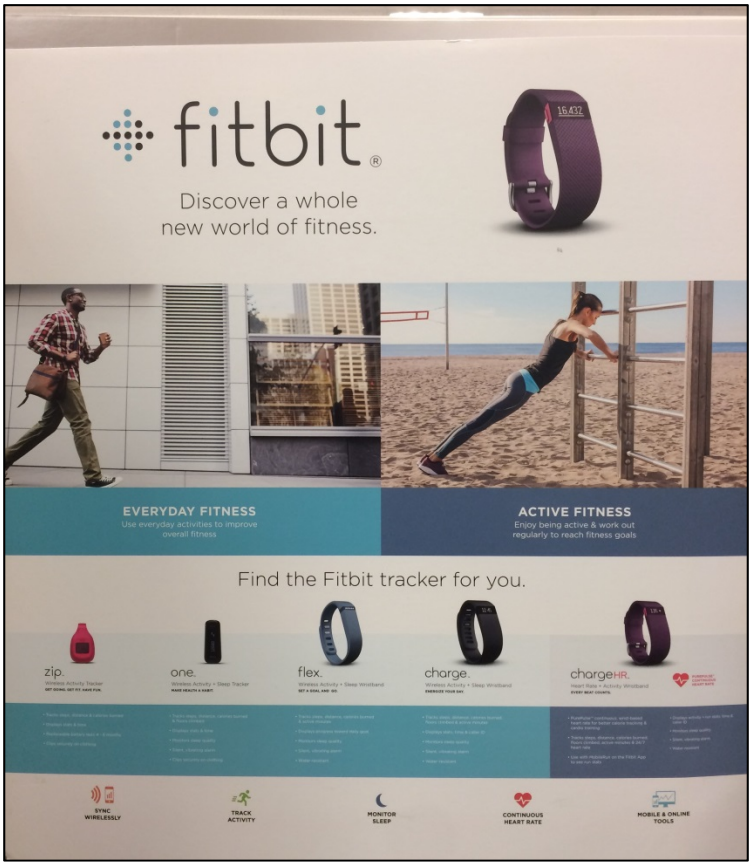

Maintain intensity to make the most of workouts.
Check heart rate at a glance to gauge your effort and adjust workouts on the spot.
Set a target heart rate zone to ensure you're pushing yourself hard enough, but not overtraining.
See your time spent in each heart rate zone and review exercise summaries.
TIPS TO GET THE MOST OF PUREPULSE™ DURING WORKOUTS

27. Fitbit's representations are also present at many points of sale. Some Best Buy locations, for example, maintain a full comparative display with an interactive touchscreen and video feature, as shown below.





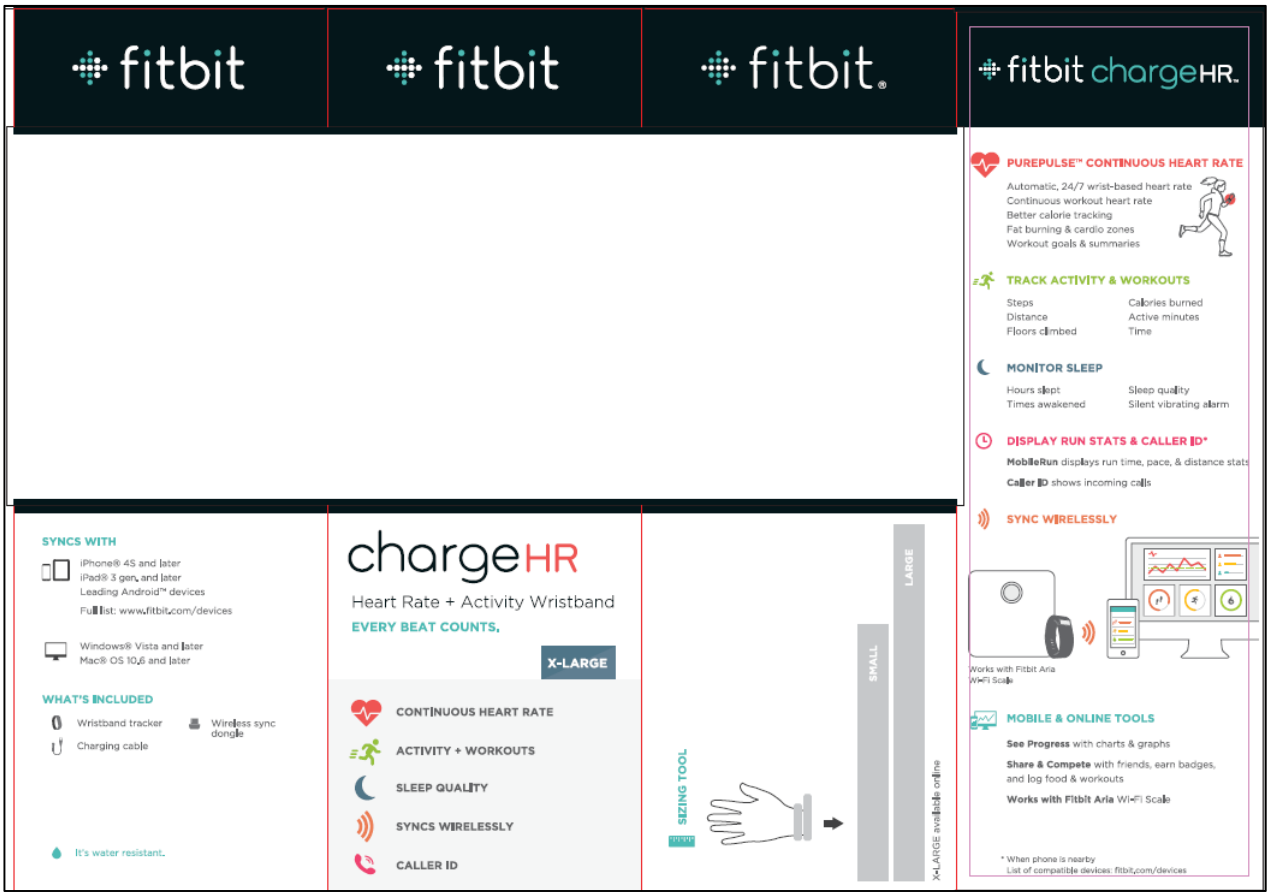
28. Some Target sites feature a similar, though lower-tech, display:



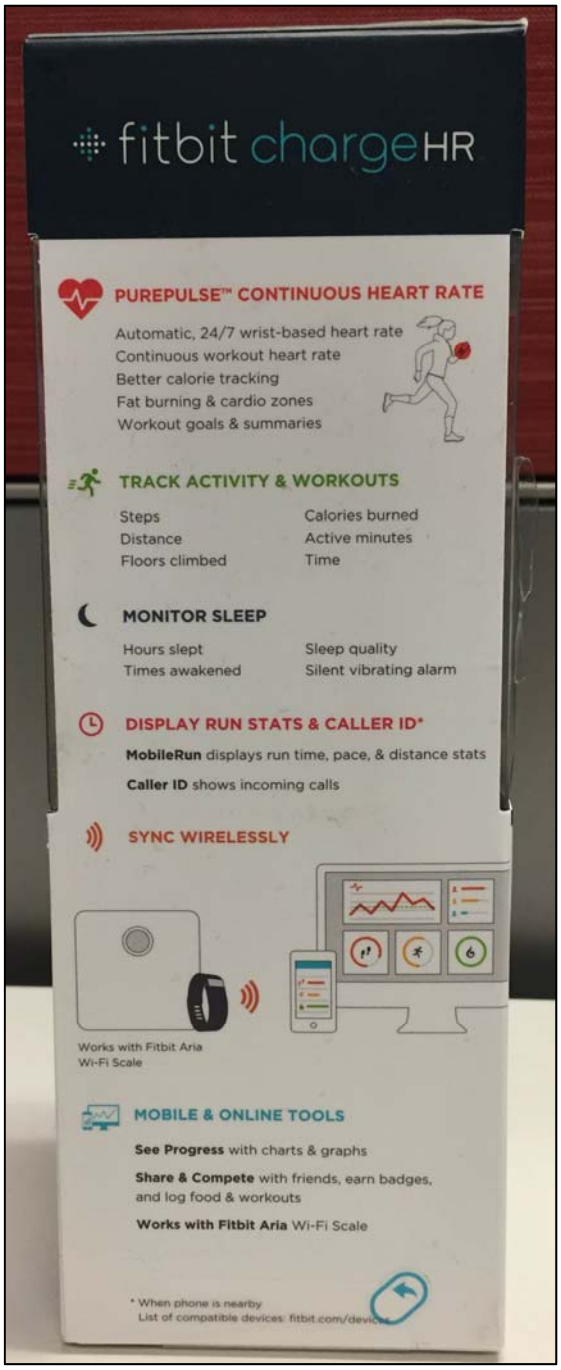
29. Fitbit's representations even permeate electronic points of sale of third-party online retailers. For example, in advertising the Charge HR, the Kohl's website encourages consumers to "Make every beat count!" and promises that the "Charge HR delivers continuous,

wrist-based heart rate and activity tracking during workouts and beyond."[6] These representations track Fitbit's advertisements verbatim.

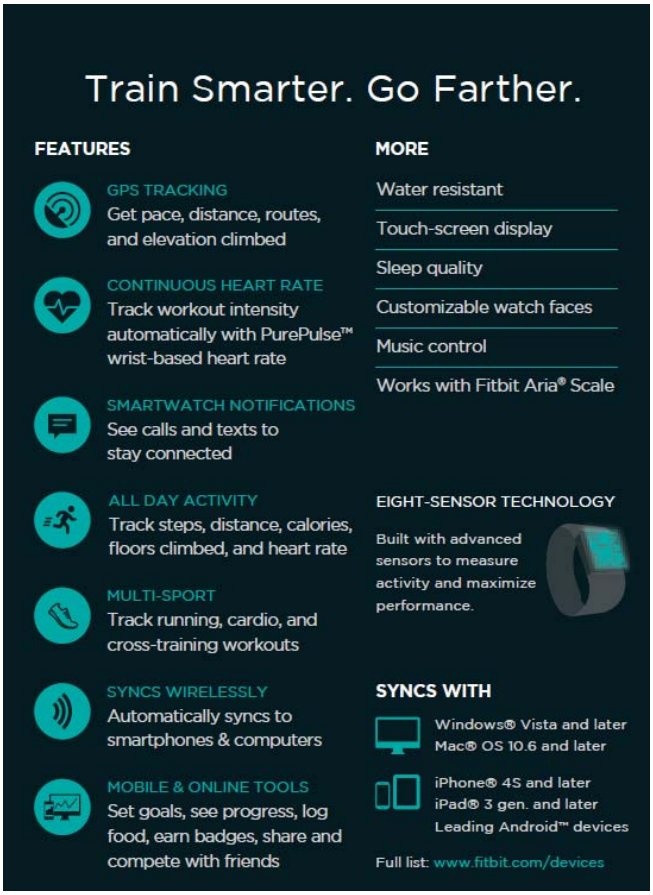
30. Fitbit made similar representations on the product packaging for all three PurePulse devices. The Charge HR packaging included representations that the device provided "Heart Rate," "CONTINUOUS HEART RATE," "PUREPULSE CONTINUOUS HEART RATE," "Automatic, 24/7 wrist-based heart rate," and "Continuous workout heart rate." Next to those statements, the packaging also depicts an image of a heart with an electrocardiograph line running through them and a user running while wearing the device. As sold, the device also displays an elevated heart rate of 135 bpm. Images of the Charge HR product packaging, including the design layout produced by Fitbit, are shown below:



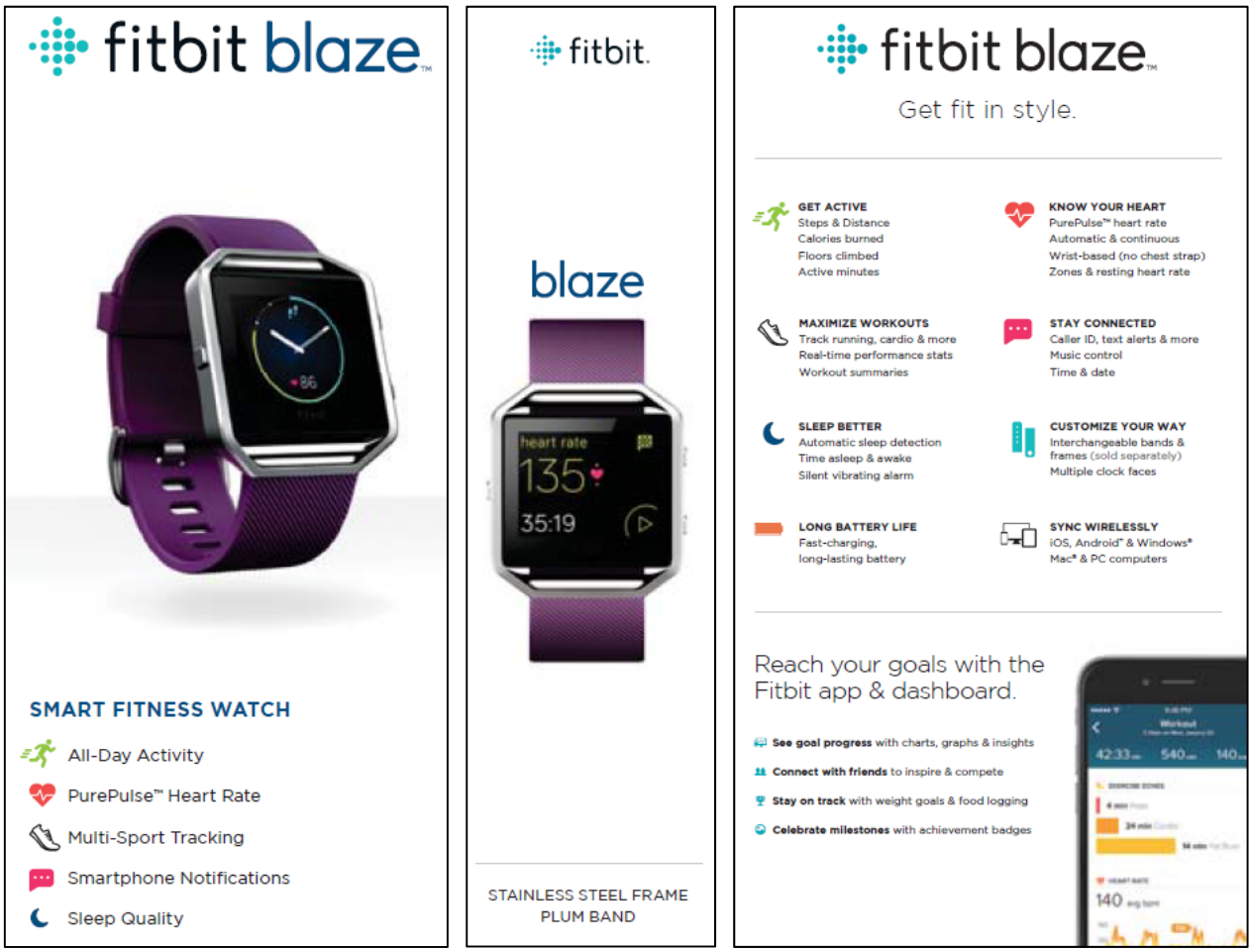
[6] Available at: http://www.kohls.com/product/prd-2389728/fitbit-charge-hr-wireless-activity-heart-rate-wristband.jsp (last visited January 28, 2016).



31. Similarly, on the Surge packaging, Fitbit represents that the device offers "HEART RATE CONTINUOUS WRIST-BASED" and "CONTINUOUS HEART RATE" and can "Track workout intensity automatically with PurePulse™ wrist-based heart rate." It also depicts the device displaying an elevated heart rate of 162 BPM. Relevant excerpts from the design layout of the Surge product packaging produced by Fitbit are shown below:



32. Likewise, on the Blaze packaging, Fitbit represents the device offers "PurePulse Heart Rate" that is "Automatic & continuous." It also represents the feature will allow users to "KNOW YOUR HEART" and again features the heart image with the electrocardiograph line running through it, and shows the device displaying an elevated heart rate of 135 bpm. Relevant excerpts from the design layout of the Blaze product packaging produced by Fitbit are shown below:



33. In sum, Fitbit's representations regarding the ability of the PurePulse Trackers to consistently record accurate heart rates, even during exercise, are unambiguous and widespread.

II. The PurePulse Trackers Fail to Consistently Record Accurate Heart Rate as Promised and Warranted.

34. Unfortunately, the PurePulse Trackers do not work, and their heart rate readings are wildly inaccurate.

35. Plaintiff Dunn, for example, cross-checked the heart rate readings from his Charge HR against other heart rate monitors during intense physical activity and found that the Charge HR's readings were radically lower than those from the other devices.

36. Teresa Black (whose claims have been sent to arbitration), observed that her Charge HR under-recorded her heart rate while exercising with her personal trainer. Shortly after

a high-intensity routine, they compared her Charge HR's heart reading with a manual heart rate test, and found the PurePulse Tracker significantly under-recorded her heart rate.

37. Kate McLellan (also sent to arbitration) had the same problem. She cross-referenced the heart rate readings from her Charge HR with the readings from a stationary cardiovascular machine. Again, the readings from her PurePulse Tracker were too low.

38. David Urban (sent to arbitration) had the same problem, which he verified by checking his Surge against his chest strap heart rate monitor.

39. Indeed, every plaintiff named in the Amended Consolidated Consumer Class Action Complaint observed significant inaccuracies, which rendered their PurePulse Trackers effectively worthless as high-intensity heart rate monitors.

40. Scores of customer complaints confirm these are not isolated incidents. The following, for example, is a non-exhaustive sampling of complaints about the PurePulse Trackers drawn from user reviews on Amazon.com:

- "The HR technology is not accurate. It's close enough below 100bpm. But 100+ and it's consistently off by 30-50%. I tested this multiple times against my chest strap and other monitors in the gym."
- "The FitBit is regularly lower than the Polar [chest strap monitor] or cannot capture a reading at all."
- "Workouts I know I've kept my heart rate in the 140-170 range, Fitbit says an average of 100 bpm and a max of 120. I've measure it against a chest strap as well as machines at the gym. It's just not accurate, simple as that. Huge disappointment. Not to mention it randomly stops tracking heart rate during the workout…"
- "I checked the HR accuracy of the new fitbit Charge by using it along with my Zephyr HRM which is worn on the chest and I have used for several years now. The accuracy of the fitbit swung wildly even when I switched the HR controls of the Charge from 'auto' to 'on'. It could be off by as much as 20 BPM! That's fricken robbing me of my workout!"
- "I followed all the directions very closely as far as placement, etc, but there is a 30 beat/min difference between the fitbit and my Timex HR chest strap HR monitor with the discrepancy increasing as my heart rate increased."
- "[A]s soon as my HR got above 120 [the Charge HR] either shuts down or just sits on 120. On a couple different occasions I wore my Polar at the same time. Polar had my highest heart rate at 160 BPM while the charge hr had me resting at 75."

- "Paid extra money for HR function and it's useless….If accuracy is important to you, this isn't for you."
- "If you are buying the HR version you are essentially just buying a more expensive Charge that has two green lights on the back and has a nicer strap because the heart rate function is useless."
- "While working out, the heart rate jumps around for no reason. I have tried many different positions and modified the tightness. Nothing seems to help….What good is tracking your heart rate when it's mostly wrong[?]"
- "I am a 82 year old with a resting heart rate of 50 BPM just trying to stay in good basic shape using a stationary bike and rowing machine. I do 30-60 minute sessions at about 100-110 BPM…When I am working the exercise machines the reading is far short of my actual heart rate. I have tried all the suggestions here and on the Fitbit site. No luck. I am reminded of the proverbial broken clock which is 100% accurate twice a day."
- "During my workouts the heart rate goes all over the place, [my Fitbit Blaze] will show my heart rate at 150 then will go up to 200 and down to 108 within a couple of minutes and takes forever to register the proper heart rate. I would imagine this has to do with my wrist sweating and is I have to take it off and keep drying it then what good is it."
- "DO NOT BUY THIS AS A 'FITNESS' WATCH or a heartrate monitor…. I've used the Blaze during numerous workouts over the course of three weeks. I've used it on the treadmill, weight lifting (all muscle groups), kettlebell and plyometics. I can now confidently say the Blaze HR monitor is BAD at detecting my heart rate during all of those activities, except on the treadmill, it did fine there. MOST of the time it is not even in the correct zone, always low. Within the mentioned activities, I've tried every combination of tightness and placement on my wrist. From time to time it'll be accurate, but it's rare and not often enough to use that HR in my workout. The higher my heart rate the worse it gets. It MIGHT be okay if your heartrate never get over 120-130."
- "I bought [the Blaze] to replace my chest strap (I hate wearing them) during workouts. Here's where the trouble starts. Depending on the workout my heart rate according to my manual measurement and the chest strap is MUCH higher than the Blaze would suggest. Sometimes the actual heart rate was double or more! At best this can lead to a gross miscalculation of calories burned. At worst it could be dangerous for someone not familiar with their target zones."

A. <u>Comprehensive Expert Analysis Further Confirms That The PurePulse Trackers Cannot Provide Meaningful Heart Rate Data.</u>

41. Expert analysis confirms that the PurePulse Trackers cannot perform as promised and warranted. Before filing this lawsuit, Plaintiff's counsel consulted a board-certified cardiologist to test the PurePulse Trackers against an electrocardiogram ("ECG"), the gold standard of heart rate monitoring, on a number of subjects at various exercising intensities.

42. The results corroborated the consumer complaints: the PurePulse Trackers consistently mis-recorded the heart rates by a significant degree. At intensities over 110 bpm, the PurePulse Trackers often failed to record any heart rate at all. And even when they did record heart rates, the PurePulse Trackers were inaccurate by an average of 24.34 bpm, with some readings off by as many as 75 bpm. With those margins of error, the PurePulse Trackers are effectively worthless as heart rate monitoring devices.

43. Since then, researchers at Cal Poly Pomona conducted the most thorough and comprehensive study of the PurePulse Trackers performed to date, which resulted in a peer-review-quality report, attached as Exhibit 1. The study authors, Drs. Edward Jo and Brett Dolezal, have considerable experience with product validation studies and set out to determine whether the PurePulse Trackers are statistically-valid heart rate monitors. As the report unequivocally demonstrates, they are not.

44. The professors tested the Trackers on 43 separate subjects during a variety of activities, including the precise exercises depicted by Fitbit when marketing the Trackers, such as jogging, stair climbing, jump roping, and plyometrics. While performing these activities, each subject wore two PurePulse Trackers—a Charge HR and a Surge—on different wrists, which were measured against a time-synchronized ECG.

45. After carefully analyzing the more than 46 hours' worth of comparative data—including hundreds of thousands of individual data points—that resulted from this testing, Drs. Jo and Dolezal concluded that the Fitbit devices simply could not accurately track users' actual heart rates, particularly during exercise.

46. Indeed, the data revealed that "during moderate to high intensity exercise, the PurePulse Trackers recorded a heart rate that differed from the ECG by an average of 19.2 bpm."

47. Even that grossly inaccurate number is generous to Fitbit since it disregards the many instances in which the Fitbit devices recorded no heart rate at all. Interpret those readings as a heart rate of zero, and the average discrepancy balloons to 24.23 bpm.

48. The report also confirms that the devices are not only inaccurate, but also surprisingly inconsistent. The two devices simultaneously recording the same users' heart rate were off even from each other by an average of 10 bpm.

49. The report thus concludes: "The PurePulse Trackers do not accurately measure a user's heart rate, particularly during moderate to high intensity exercise, and cannot be used to provide a meaningful estimate of a user's heart rate." This is precisely what Plaintiff has alleged.

50. The Cal Poly Pomona study is no anomaly. Indeed, the lead author of a subsequent study conducted at the Cleveland Clinic Heart and Vascular Institute, the top ranked heart hospital in the nation, noted that "as people moved, the study had readings that could be off by 30 and 40 bpm, so it's not a small difference."[7] Yet another independent study, this one conducted by researchers at the University of Leeds, concluded that the "precision" of the PurePulse technology "is poor" and that "an individual heart rate measure could plausibly be underestimated by almost 30 bpm."[8]

B. Third-Party, Independent Media Reviews Also Confirm Fitbit's Failures.

51. Several independent reviews reached similar conclusions. Wareable.com, for instance, concluded that the Charge HR heart rate readings were "criminally wide of the mark," even at rest.[9] Similarly, it found that the Surge took between five and eight minutes to get even close to the proper heart rate during exercise, and even then, it failed to record heart rates in even the right "zone" about twenty percent of the time.[10] Ultimately, the review concluded that the

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[7] Karen Pallorito, HealthDay, *Fitbit, Other Heart Rate Wristbands Often Inaccurate: Study* (Oct. 12, 2016), https://consumer.healthday.com/fitness-information-14/misc-fitness-health-news-312/fitbit-other-heart-rate-wristbands-often-inaccurate-study-715766.html (last visited April 6, 2018) (quoting study author); *see also* Dkt. 86-2 (Research Letter).

[8] Simone Benedetto et al., *Assessment of the Fitbit Charge 2 for monitoring heart rate* (Feb. 28, 2018), http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0192691 (last visited April 6, 2018).

[9] James Stables, *Fitbit Charge HR review, UPDATED: Fitbit's flagship tracker now lags behind the competition*, Wareable (Dec. 15, 2015), http://www.wareable.com/fitbit/fitbit-charge-hr-review.

[10] Shane Richmond, *The real world wrist-based heart rate monitor test: Are they accurate enough? Fitbit, Mio and Basis versus the trusty chest strap*, Wareable (July 3, 2015), http://www.wareable.com/fitness-trackers/heart-rate-monitor-accurate-comparison-wrist.

PurePulse Trackers offer nothing more than an "estimate" of heart rate, and the publication could not recommend the PurePulse Trackers for "those doing training based on heart rate zones."[11]

52. A German consumer organization, Stiftung Warentest, conducted a comparable test pitting a PurePulse Tracker against an ECG on five subjects at a variety of intensities. After the testing, the reviewers found the heart rate readings "imprecise" and gave the heart rate functionality a "D" grade.[12]

53. Another striking example comes from a broad study commissioned by a TV station in Indiana, WTHR, in collaboration with researchers at the Human Performance Laboratory at Ball State University.[13] There, the researchers compared the Charge HR (and other devices) against sophisticated laboratory fitness equipment—including a pulse oximeter and a metabolic analyzer—during hour-long tests which included a variety of both high and low intensity activities.

54. The results were very, very bad for Fitbit. The heading of the section of the article addressing heart rate read "Heart rate: Bordering on dangerous." It went on to note:

> The box for the Fitbit Charge HR says "every beat counts." Despite what the package says, the tracking device inside missed lots of them.
>
> For example, when the Fitbit detected Alexis' heart rate at 68 beats per minute, the portable pulse oximeter showed her real heart rate was actually much higher at 91.
>
> . . .
>
> Calculating a heart rate that's off by 20 or 30 beats per minute can be dangerous -- especially for people at high risk of heart disease.
>
> "That's too high to be acceptable to us," Montoye said. "Heart rate is a measure of exercise intensity. Small changes in intensity can affect the benefit you'll receive, but they also increase your risk associated with the activity. That risk can be very real … so the heart rate has to be accurate."

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[11] *Id.*

[12] *Noch nicht in Topform*, Stiftung Warentest (Jan. 2016), https://www.test.de/Fitnessarmbaender-Nur-zwei-von-zwoelf-sind-gut-4957497-0/

[13] Bob Segall, *Sometimes your fitness tracker lies – a lot*, WTHR (Feb. 22, 2016), http://www.wthr.com/story/31285468/sometimes-your-fitness-tracker-lies-a-lot-fitbit-jawbone-garmin-ifit-misfit-accuracy.

In sum, the study concluded that the average error rate for the PurePulse heart rate readings was about 14%, which is ***almost triple what the researchers deemed to be an acceptable margin of error***. (The PurePulse Tracker was also 40% less accurate than the competitor device.)

55. Notably, the calorie counting functionality—which relies on the heart rate readings, as Fitbit's own promotional materials explain—also performed terribly. The lead researcher concluded that "[t]he numbers aren't even close," and the article noted that the Charge HR over-recorded one subject's calorie burn by ***122%***.

56. Based on these "woeful test results," the WTHR reviewers gave the Charge HR one star out of four for both the heart rate and calorie counting features, which denoted a greater than 12% and 30% error rate, respectively.

C. Fitbit Has Not Credibly Responded and Cannot Credibly Respond to These Studies.

57. Fitbit's response to the WTHR study, and to the allegations in previous versions of this Complaint, is telling. Fitbit has repeatedly told the press that "our team has performed and continues to perform internal studies to validate our products' performance."[14] Yet, in response to Plaintiff's Complaint, Fitbit has not referenced a single, specific study which it contends in fact validates its products' performance, nor has it disclosed the details of *any* study to Plaintiff's counsel, despite their repeated requests.

58. Instead, in discussions with Plaintiff's counsel, Fitbit has relied on a meager test conducted by Consumer Reports,[15] which post-dates Plaintiff's original Complaint and Fitbit's representations about its internal studies. But the Consumer Reports experiment suffers from serious flaws—it did not use sophisticated laboratory equipment and tested a only small range of activities—and does not begin to counter the overwhelming evidence demonstrating the inaccuracy of the PurePulse Trackers.

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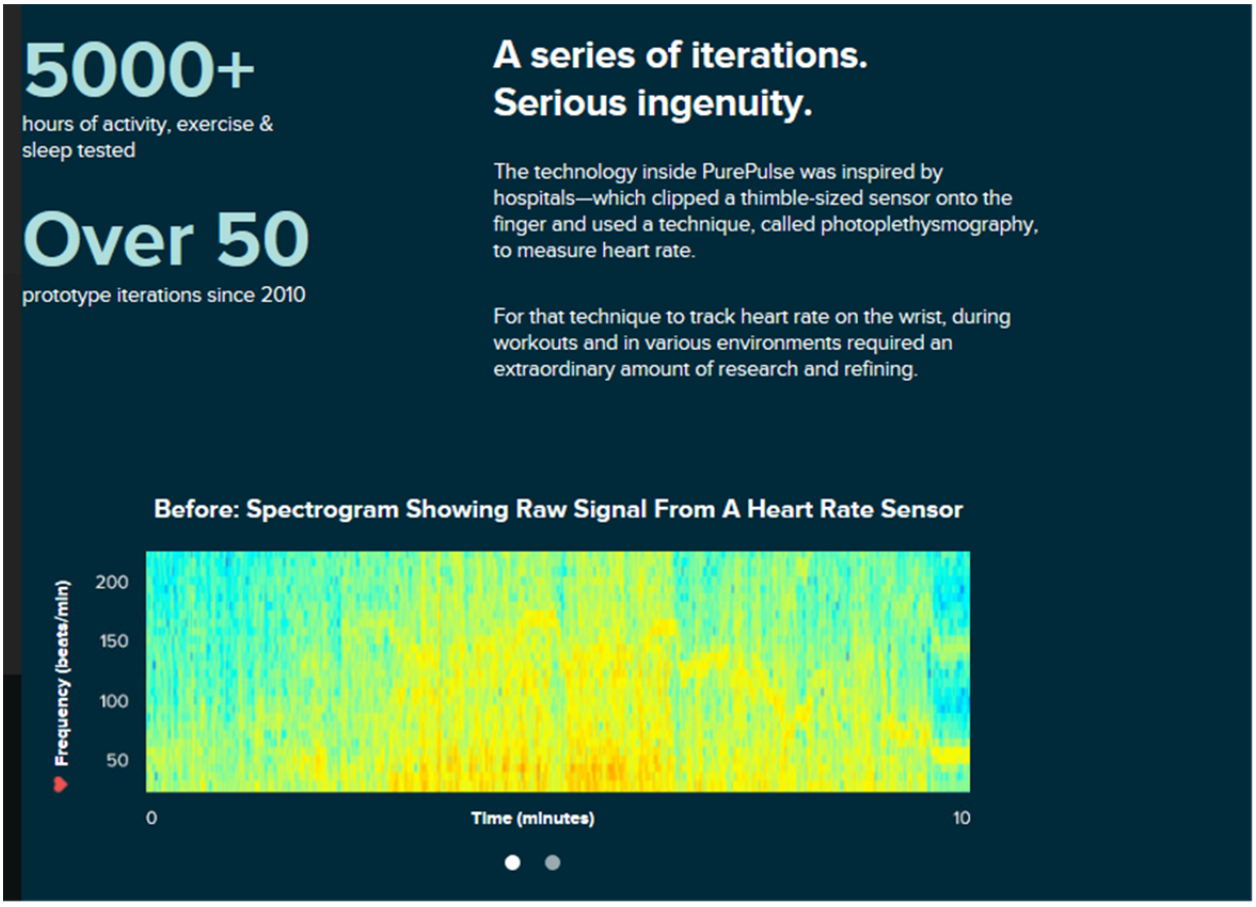
[14] *See, e.g.*, Jason Cipriani, *Lawsuit Says Fitbit Fitness Trackers Are Inaccurate*, Fortune (Jan. 6, 2016), http://fortune.com/2016/01/06/fitbit-heart-rate-accuracy-lawsuit/.

[15] Patrick Austin, *Taking the Pulse of Fitbit's Contested Heart Rate Monitors*, Consumer Reports (Jan. 22, 2016), http://www.consumerreports.org/fitness-trackers/taking-the-pulse-of-fitbits-contested-heart-rate-monitors.

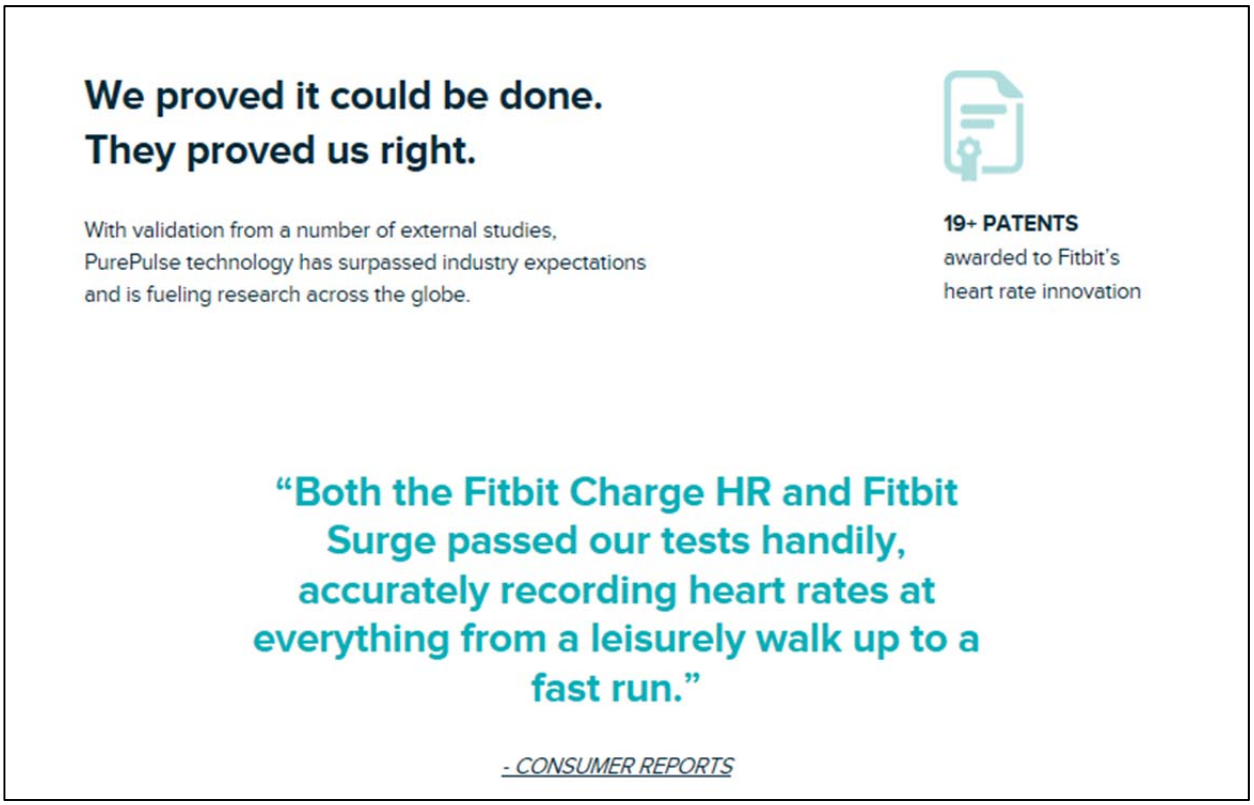
59. Notably, long after the initial Complaint was filed, Fitbit doubled down on its unsupported claim that the devices had been validated by scientific research. Fitbit's website now boasts that the PurePulse technology "required an extraordinary amount of research and refining: and resulted from "5000+ hours of activity, exercise & sleep tested" and "over 50 prototype iterations since 2010." Yet, Fitbit does not provide any details regarding the purported validation studies it performed, and still has not produced that data to Plaintiff, despite his repeated efforts to discover that critical information. A screenshot of Fitbit's website representations is shown below:[16]



60. Fitbit also now claims that the "PurePulse technology has surpassed industry expectations" and has received "validation from a number of external studies." Notably, however, the only "study" actually quoted or referenced is the unscientific Consumer Reports test

[16] Available at https://www.fitbit.com/technology (last visited February 1, 2018).

discussed above. Fitbit's website deceptively fails to mention the many other studies that reached the opposite conclusion. The relevant website representations are depicted below: [17]



61. Fitbit's other public defense to the damning reviews and to the allegations in this Complaint is an (irrelevant) after-the-fact disclaimer. Fitbit has pleaded with the press that the PurePulse Trackers "are not intended to be scientific or medical devices."[18] This plea has fallen on deaf ears. The author of the WTHR article, commenting on Fitbit's written response to the article, astutely asked: "since when does a wristband accelerometer with a built-in heartbeat monitor not qualify as a scientific or medical device?"

62. No amount of post-hoc disavowals can change the fact that Fitbit has marketed the PurePulse Trackers as medical devices. For example, Fitbit claims on its website that "the technology inside PurePulse was inspired by hospitals." The company also recommends that consumers "[s]et a target heart rate zone to ensure you're pushing yourself hard enough, but not

[17] Available at https://www.fitbit.com/technology (last visited February 1, 2018).

[18] *Fitbit accused of putting customers in danger with 'wildly inaccurate' heart rate readings*, ITV Report (Jan. 8, 2016), http://www.itv.com/news/2016-01-08/fitbit-accused-of-putting-customers-in-danger-with-wildly-inaccurate-heart-rate-readings/.

overtraining," and advises them to "[t]alk to your doctor to learn which heart rate zones are right for you."

63. Fitbit's own CEO, James Park has also promoted the medical potential of the devices, as reflected in his statement from Fitbit's February 22, 2016, Earnings Call:

> While Fitbit is known as a consumer brand, the real potential of our brand and technology is to become a digital health platform that improves people's health and integrates into their healthcare ecosystem. Digital health refers to the emergence of powerful technologies that combined can help people lead healthier lives, reduce healthcare costs and broaden the reach of our healthcare system.
>
> These technologies include what Fitbit is already pioneering, more powerful sensors that continuously monitor useful biometrics, massive sets of health data in the cloud where analytics enable insights, and guidance and coaching to help consumers make important changes to their lifestyles and daily behaviors.
>
> …
>
> Fitbit trackers are distributed as the device of choice in several disease management programs for two of the largest U.S. health insurers.
>
> …
>
> Fitbit also is increasingly active in the medical research community by supporting researchers who are incorporating Fitbit trackers and interactive features into their efforts.

64. But perhaps more importantly, whether the PurePulse Trackers are "medical devices" is beside the point. Representations regarding the accuracy of heart rate monitors have significant health and safety implications regardless of how the devices are labeled. What matters in this case is that Fitbit represented to Plaintiff and the Class that the PurePulse Trackers could consistently record accurate heart rates when in fact they cannot. This is classic consumer fraud.

65. Interestingly, Fitbit even *admitted* informally to some Class members that the PurePulse Trackers are inaccurate during high-intensity workouts. As such, the PurePulse Trackers fail to perform the precise task for which they are expressly marketed, and Class members are deprived of the clear benefit of the bargain.

CLASS ACTION ALLEGATIONS

66. Plaintiff bring this lawsuit as a class action on their own behalf and on behalf of all other persons similarly situated as members of the proposed Class, pursuant to Federal Rules of Civil Procedure 23(a) and (b)(3), and/or (b)(1), (b)(2), and/or (c)(4). This action satisfies the numerosity, commonality, typicality, adequacy, predominance, and superiority requirements of those provisions.

67. The proposed **Nationwide Class** is defined as:

> All persons or entities in the United States who purchased a Fitbit PurePulse Tracker, as defined herein, and who opted out of the arbitration clause contained in Fitbit's Terms of Service.

68. California law applies to the claims of all Class members, for the reasons outlined below. In the alternative, however, Plaintiff proposes an **Arizona Subclass**, defined as:

> All persons or entities in Arizona who purchased a Fitbit PurePulse Tracker, as defined herein, and who opted out of the arbitration clause contained in Fitbit's Terms of Service.

69. Excluded from the Nationwide Class and Arizona Subclass (the "Classes") are: (A) Fitbit, any entity or division in which Fitbit has a controlling interest, and their legal representatives, officers, directors, assigns, and successors; (B) the Judge to whom this case is assigned and the Judge's staff; (C) governmental entities; and (D) those persons who have suffered personal injuries or actionable emotional distress as a result of the facts alleged herein. Plaintiff reserve the right to amend the Class definitions if discovery and further investigation reveal that any Class should be expanded, divided into additional subclasses, or modified in any other way.

Numerosity and Ascertainability

70. Although the exact number of Class members is uncertain, the size of the Classes can be estimated with reasonable precision, and the number is great enough that joinder is impracticable.

71. Per Fitbit's records, as of August 1, 2016, 188 PurePulse Tracker purchasers had opted out of the arbitration clauses in Fitbit's Terms of Service. It is likely that more have opted out in the intervening years. The disposition the Class members' claims in a single action will

provide substantial benefits to all parties and to the Court. Class members are readily identifiable from information and records in possession, custody, or control of Fitbit, the Class members, and the PurePulse Tracker retailers.

Typicality

72. The claims of the representative Plaintiff are typical of the claims of the Classes in that the representative Plaintiff, like all Class members, purchased a PurePulse Tracker designed, manufactured, and distributed by Fitbit. The representative Plaintiff, like all Class members, was damaged by Fitbit's misconduct in that he has suffered actual damages as a result of his purchase of the PurePulse Trackers. Furthermore, the factual bases of Fitbit's misconduct represent a common thread of misconduct resulting in injury to all Class members.

Adequate Representation

73. Plaintiff is a member of the Classes and will fairly and adequately represent and protect the interests of the Classes. Plaintiff has retained counsel with substantial experience in prosecuting consumer class actions, including actions involving defective products.

74. Plaintiff and his counsel are committed to vigorously prosecuting this action on behalf of the Classes and have the financial resources to do so. Neither Plaintiff nor his counsel have interests adverse to those of the Classes.

Predominance of Common Issues

75. There are numerous issues of law and fact common to Plaintiff and Class members that predominate over any issue affecting only individual Class members. Resolving these common issues will advance resolution of the litigation as to all Class members. These common legal and factual issues include:

a. whether the PurePulse Trackers fail to consistently deliver accurate heart rate monitoring, as advertised and warranted;

b. whether Fitbit knew or should have known that the PurePulse Trackers do not consistently deliver accurate heart rate monitoring;

c. whether the inability of the PurePulse Trackers to consistently record accurate heart rates constitutes a material fact that reasonable consumers would have considered

important in deciding whether to purchase a PurePulse Tracker or pay an increased price for them;

d. whether Fitbit's concealment of the Heart Rate Defect in the PurePulse Trackers induced reasonable consumers to act to their detriment by purchasing a PurePulse Tracker;

e. whether Fitbit made material misrepresentations regarding PurePulse Trackers;

f. whether Fitbit had a duty to disclose the true nature of the PurePulse Trackers to Plaintiff and Class members;

g. whether Fitbit omitted and failed to disclose material facts about the PurePulse Trackers;

h. whether Plaintiff and Class members are entitled to a declaratory judgment;

i. whether Plaintiff and Class members are entitled to equitable relief, including, but not limited to, a preliminary and/or permanent injunction, and /or rescission;

j. whether Plaintiff and Class members are entitled to restitution and/or disgorgement and the amount of such;

k. whether Plaintiff and Class members are entitled to actual damages and the amount of such; and

l. whether Plaintiff and Class members are entitled to punitive or exemplary damages and the amount of such.

Superiority

76. Plaintiff and Class members all suffered—and will continue to suffer—harm and damages as a result of Fitbit's uniformly unlawful and wrongful conduct. A class action is superior to other available methods for the fair and efficient adjudication of this controversy.

77. Absent a class action, most Class members would likely find the cost of litigating their claims prohibitively high and would have no effective remedy at law. Because of the relatively small size of the individual Class members' claims, it is likely that few, if any, Class members could afford to seek legal redress for Fitbit's misconduct. Absent a class action, Class

members' damages will go uncompensated, and Fitbit's misconduct will continue without remedy.

78. Class treatment of common questions of law and fact would also be a superior method to multiple individual actions or piecemeal litigation in that class treatment will conserve the resources of the courts and the litigants, and will promote consistency and efficiency of adjudication.

79. Fitbit has acted in a uniform manner with respect to the Plaintiff and Class members.

80. Classwide declaratory, equitable, and injunctive relief is appropriate under Rule 23(b)(1) and/or (b)(2) because Fitbit has acted on grounds that apply generally to the class, and inconsistent adjudications with respect to the Fitbit's liability would establish incompatible standards and substantially impair or impede the ability of Class members to protect their interests. Classwide relief assures fair, consistent, and equitable treatment and protection of all Class members, and uniformity and consistency in Fitbit's discharge of their duties to perform corrective action regarding the PurePulse Trackers.

CHOICE OF LAW ALLEGATIONS

81. Because this Complaint is brought in California, California's choice of law regime governs the state law allegations in this Complaint.

82. Under California's governmental interest/comparative impairment choice of law rules, California law applies to the claims of all Class members, regardless of their state of residence or state of purchase.

83. Because Fitbit is headquartered—and made all decisions relevant to these claims—in California, California has a substantial connection to, and materially greater interest in, the rights, interests, and policies involved in this action than any other state.

84. Nor would application of California law to Fitbit and the claims of all Class members be arbitrary or unfair. Indeed, in its Terms of Service, Fitbit declares that, regardless of any state's conflict of law principles, "the resolution of any Disputes shall be governed by and construed in accordance with the laws of the State of California."

CLAIMS FOR RELIEF

FIRST CLAIM FOR RELIEF
Violations of California's Consumers Legal Remedies Act,
Cal. Civ. Code § 1750, *et seq.*

85. Plaintiff hereby incorporates by reference the allegations contained in the preceding paragraphs of this Complaint.

86. This claim is brought on behalf of the Nationwide Class to seek injunctive relief as well as monetary damages against Fitbit under California's Consumers Legal Remedies Act ("CLRA"), Cal. Civ. Code § 1750, *et seq.*

87. Fitbit is a "person" as defined by the CLRA. Cal. Civ. Code § 1761(c).

88. Plaintiff and Class members are "consumers" within the meaning of the CLRA, as defined by Cal. Civ. Code § 1761(d), who purchased one or more PurePulse Trackers.

89. The CLRA prohibits "unfair or deceptive acts or practices undertaken by any person in a transaction intended to result or which results in the sale or lease of goods or services to any consumer[.]" Cal. Civ. Code § 1770(a).

90. Fitbit engaged in unfair or deceptive trade practices that violated Cal. Civ. Code § 1770(a), as described above and below, by, among other things, failing to disclose the defective nature of the PurePulse Trackers, representing that the PurePulse Trackers had characteristics and benefits that they do not have (e.g., the ability to consistently record accurate heart rates, even during high-intensity exercise), representing that the PurePulse Trackers were of a particular standard, quality, or grade when they were of another, and advertising PurePulse Trackers with the intent not to sell them as advertised. *See* Cal. Civ. Code §§ 1770(a)(5), (a)(7), (a)(9).

91. Fitbit knew, should have known, or was reckless in not knowing that its products did not have the qualities, characteristics, and functions it represented, warranted, and advertised them to have.

92. Fitbit's unfair and deceptive acts or practices occurred repeatedly in Fitbit's course of trade or business, were material, were capable of deceiving a substantial portion of the purchasing public, and imposed a safety risk to Plaintiff and Class members.

93. Fitbit was under a duty to Plaintiff and Class members to disclose the deceptive and defective nature of the PurePulse Trackers because:

a. The defect in the PurePulse Trackers presents a safety hazard because Class members could jeopardize their health by relying on the inaccurate heart rate readings and potentially achieving dangerous heart rates;

b. Fitbit was in a superior position to know the true state of facts about the Heart Rate Defect in the PurePulse Trackers;

c. Plaintiff and Class members could not reasonably have been expected to learn or discover that the PurePulse Trackers contained the Heart Rate Defect; and

d. Fitbit knew that Plaintiff and Class members could not reasonably have been expected to learn or discover the defect in the PurePulse Trackers.

94. In failing to disclose the defective nature of the PurePulse Trackers, Fitbit knowingly and intentionally concealed material facts and breached its duty not to do so.

95. The facts that were misrepresented, concealed, or not disclosed by Fitbit to Plaintiff and Class members are material in that a reasonable consumer would have considered them to be important in deciding whether or not to purchase a PurePulse Tracker. Had Plaintiff and other Class members known about the true nature and quality of the PurePulse Trackers, they would not have purchased a PurePulse Tracker or would have paid significantly less than they did for their PurePulse Trackers.

96. Plaintiff and Class members are reasonable consumers who expect that their PurePulse Trackers will consistently record accurate heart rates, as represented.

97. As a result of Fitbit's conduct and unfair or deceptive acts or practices, Plaintiff and Class members suffered actual damages in that the PurePulse Trackers do not function as represented and are not worth the amount paid and Fitbit has deprived Plaintiff and Class members the benefit of the bargain.

98. Plaintiff and the Class seek an order enjoining Fitbit's unfair or deceptive acts or practices, equitable relief, an award of attorneys' fees and costs under Cal. Civ. Code § 1780(e), and any other just and proper relief available under the CLRA.

99. In addition, many Class members are senior citizens or disabled persons, as defined by Cal. Civ. Code §§ 1761(f) and (g), who suffered substantial economic damage resulting from the Fitbit's fraudulent representations regarding the PurePulse Trackers. Each of those Class members is entitled to up to an additional $5,000. Cal. Civ. Code § 1780(b).

100. In accordance with section 1782(a) of the CLRA, on November 16, 2015, counsel in the *McLellan* action served Fitbit with notice of its alleged violations of Cal. Civ. Code § 1770(a) relating to the Heart Rate Defect in the PurePulse Trackers purchased by Plaintiff and Class members. Counsel in the *Landers* action did the same on February 22, 2016. Those letters are attached to this Complaint as Exhibits 2 and 3, for reference. Fitbit did not correct or agree to correct the actions described in the letter and in this Complaint within thirty (30) days of the notices. Fitbit's responses are attached as Exhibits 4 and 5. Plaintiff and Class members thus seek an award of compensatory, monetary, and punitive damages based on the conduct described herein, as well as any other relief the Court deems proper.

SECOND CLAIM FOR RELIEF
Violations of California's False Advertising Law,
Cal. Bus. & Prof. Code §§17500, *et seq*.

101. Plaintiff hereby incorporates by reference the allegations contained in the preceding paragraphs of this Complaint.

102. Plaintiff brings this cause of action for himself and on behalf of the Nationwide Class.

103. California's False Advertising Law ("FAL"), Bus. & Prof. Code §§17500, *et seq*., makes it "unlawful for any person to make or disseminate or cause to be made or disseminated before the public in this state, . . . in any advertising device . . . or in any other manner or means whatever, including over the Internet, any statement, concerning . . . personal property or services, professional or otherwise, or performance or disposition thereof, which is untrue or misleading and which is known, or which by the exercise of reasonable care should be known, to be untrue or misleading."

104. Fitbit committed acts of false advertising, as defined by the FAL, by using false and misleading statements, and material omissions, to promote the sale of the PurePulse Trackers,

as described above, and including, but not limited to, representing that the PurePulse Trackers would continuously and accurately record and report Class members' real time heart rate.

105. Fitbit knew or should have known, through the exercise of reasonable care, that its statements were untrue and misleading.

106. Fitbit's actions and omissions in violation of the FAL were false and misleading such that the general public is and was likely to be deceived.

107. As a direct and proximate result of these acts and omissions, consumers have been and are being harmed. Plaintiff and Class members have suffered injury and actual out-of-pocket losses as a result of Fitbit's FAL violation because: (a) Plaintiff and Class members would not have purchased the PurePulse Trackers or would not have paid as much for them if they had known the true facts; (b) Plaintiff and Class members purchased the PurePulse Trackers due to Fitbit's misrepresentations and omissions; and (c) the PurePulse Trackers did not have the level of quality or value as promised.

108. Plaintiff brings this action pursuant to Bus. & Prof. Code § 17535 for, among other relief, injunctive relief to enjoin the practices described herein and to require Fitbit to issue corrective disclosures to consumers. Plaintiff and the Class are therefore entitled to: (a) an order requiring Fitbit to cease the acts of unfair competition alleged herein; (b) full restitution of all monies paid to Fitbit as a result of its deceptive practices; (c) interest at the highest rate allowable by law; and (d) the payment of Plaintiff's attorneys' fees and costs pursuant to, inter alia, California Code of Civil Procedure §1021.5.

THIRD CLAIM FOR RELIEF
Violations of California's Unfair Competition Law,
Cal. Bus. & Prof. Code § 17200, *et seq.*

109. Plaintiff hereby incorporates by reference the allegations contained in the preceding paragraphs of this Complaint.

110. Plaintiff brings this cause of action for himself and on behalf of the Nationwide Class.

111. California Business & Professions Code § 17200 prohibits acts of "unfair competition," including any "unlawful, unfair or fraudulent business act or practice" and "unfair,

deceptive, untrue or misleading advertising." Fitbit's conduct related to the Heart Rate Defect violated each of this statute's three prongs.

112. Fitbit committed an unlawful business act or practice in violation of Cal. Bus. & Prof. Code § 17200, *et seq.*, by their violations of the Consumers Legal Remedies Act, Cal. Civ. Code § 1750, *et seq.*, as set forth above, by the acts and practices set forth in this Complaint.

113. Fitbit committed unfair business acts and practices in violation of Cal. Bus. & Prof. Code § 17200, *et seq.*, when it represented that the PurePulse Trackers could consistently record accurate heart rate, even during exercise, when in fact they cannot. The Heart Rate Defect also presents a safety hazard as it can jeopardize the health and safety of users who rely on the inaccurate heart rate readings and unknowingly achieve dangerous heart rates.

114. Fitbit committed fraudulent business acts and practices in violation of Cal. Bus. & Prof. Code § 17200, *et seq.*, when it affirmatively and knowingly misrepresented that the PurePulse Trackers consistently record accurate heart rates, even during high-intensity exercise, when in fact they do not. Fitbit's representations and concealment of the Heart Rate Defect are likely to mislead the public with regard to the true defective nature of the PurePulse Trackers.

115. Fitbit also disseminated unfair, deceptive, untrue and/or misleading advertising in violation of Cal. Bus. & Prof. Code § 17200, *et seq.* and § 17500, *et seq.* when it distributed advertisements falsely representing that the PurePulse Trackers consistently record accurate heart rates, even at high intensity, when in fact they do not.

116. Fitbit's unfair or deceptive acts or practices occurred repeatedly in the course of Fitbit's trade or business, and were capable of deceiving a substantial portion of the purchasing public.

117. As a direct and proximate result of Fitbit's unfair and deceptive practices, Plaintiff and Class members suffered and will continue to suffer actual damages.

118. As a result of its unfair and deceptive conduct, Fitbit has been unjustly enriched and should be required to disgorge its unjust profits and make restitution to Plaintiff and Class members pursuant to Cal. Bus. & Prof. Code §§ 17203 and 17204.

119. Plaintiff and the Class further seek an order enjoining Fitbit's unfair or deceptive acts or practices, and an award of attorneys' fees and costs under Cal. Code of Civ. Proc. § 1021.5.

FOURTH CLAIM FOR RELIEF
Common Law Fraud

120. Plaintiff hereby incorporates by reference the allegations contained in the preceding paragraphs of this Complaint.

121. Plaintiff brings this cause of action for himself and on behalf of the Nationwide Class.

122. Fitbit engaged in both speaking and silent fraud, and in fraudulent and deceptive conduct. As described above, Fitbit's conduct defrauded Plaintiff and Class members, by intentionally leading them to believe, through affirmative misrepresentations, omissions, suppressions, and concealments of material fact, that the PurePulse Trackers possessed important characteristics that they in fact do not possess—namely that they could consistently record accurate heart rate, even during high-intensity exercise—and inducing their purchases.

123. Fitbit's intentional and material misrepresentations included, among other things, its advertising, marketing materials and messages, and other standardized statements claiming the PurePulse Trackers consistently record accurate heart rates.

124. The foregoing misrepresentations were uniform across all Class members. The same extensive and widespread advertising campaign was promoted nationwide, and all of the promotional materials contained the same material representations regarding the PurePulse Trackers' ability consistently record accurate heart rates.

125. These representations were false, as detailed herein. Fitbit knew the representations were false when it made them and intended to defraud purchasers thereby.

126. Fitbit also had a duty to disclose, rather than conceal and suppress, the full scope and extent of the Heart Rate Defect because:

a. Fitbit had exclusive knowledge of the Heart Rate Defect in the PurePulse Trackers and concealment thereof;

b. The details regarding the Heart Rate Defect in the PurePulse Trackers and concealment thereof were known and/or accessible only to Fitbit;

c. Fitbit knew Plaintiff and Class members did not know about the Heart Rate Defect in the PurePulse Trackers and concealment thereof; and

d. Fitbit made general representations about the qualities of the PurePulse Trackers, including statements about their performance and abilities that were misleading, deceptive, and incomplete without the disclosure of the fact that the PurePulse Trackers could not consistently record accurate heart rates, particularly during exercise.

127. Fitbit's actions constitute "actual fraud" within the meaning of Cal. Civ. Code § 1572 because Fitbit did the following with the intent to deceive Plaintiff and Class members and to induce them to enter into their contracts:

a. Suggested that the PurePulse Trackers can consistently record accurate heart rates, even at high intensities, even though it knew this to be not true;

b. Positively asserted that the PurePulse Trackers can consistently record accurate heart rates, even at high intensities, in a manner not warranted by the information available to Fitbit;

c. Suppressed the true nature of the Heart Rate Defect from Plaintiff and Class members; and

d. Promised it would deliver PurePulse Trackers that consistently record accurate heart rates, even at high intensities, with no intention of so doing.

128. Fitbit's actions, listed above, also constituted "deceit" as defined by Cal. Civ. Code § 1710 because Fitbit willfully deceived Plaintiff and Class members with intent to induce them to alter their positions to their detriment by purchasing defective PurePulse Trackers.

129. Fitbit's fraud and concealment were also uniform across all Class members; Fitbit concealed from everyone the true nature of the Heart Rate Defect in the PurePulse Trackers.

130. Fitbit's misrepresentations and omissions were material in that they would affect a reasonable consumer's decision to purchase a PurePulse Tracker. Consumers paid a premium for

the PurePulse Trackers precisely because they purportedly offered continuous, accurate heart rate readings.

131. Fitbit's intentionally deceptive conduct induced Plaintiff and Class members to purchase the PurePulse Trackers and resulted in harm and damage to them.

132. Plaintiff believed and relied upon Fitbit's misrepresentations and concealment of the true facts. Class members are presumed to have believed and relied upon Fitbit's misrepresentations and concealment of the true facts because those facts are material to a reasonable consumer's decision to purchase the PurePulse Trackers.

133. As a result of Fitbit's inducements, Plaintiff and Class members sustained actual damages including but not limited to receiving a product that performs as promised and not receiving the benefit of the bargain of their PurePulse Tracker purchases. If Plaintiff and Class members had known about the Heart Rate Defect, they would not have purchased the PurePulse Trackers or would have paid significantly less for them. Fitbit is therefore liable to Plaintiff and Class members in an amount to be proven at trial.

134. Fitbit's conduct was systematic, repetitious, knowing, intentional, and malicious, and demonstrated a lack of care and reckless disregard for Plaintiff's and Class members' rights and interests. Fitbit's conduct thus warrants an assessment of punitive damages under Cal. Civ. Code § 3294 and other applicable states' laws, consistent with the actual harm it has caused, the reprehensibility of its conduct, and the need to punish and deter such conduct.

FIFTH CLAIM FOR RELIEF
Fraud in the Inducement

135. Plaintiff hereby incorporates by reference the allegations contained in the preceding paragraphs of this Complaint.

136. Plaintiff brings this cause of action for himself and on behalf of the Nationwide Class.

137. Fitbit's fraud and false affirmations of fact, described herein, induced Plaintiff and Class members to purchase the PurePulse Trackers and thereby enter into a contract with Fitbit.

138. As described above, Fitbit had a duty to disclose the Heart Rate Defect in the PurePulse Trackers to Plaintiff and Class members.

139. As described above, Fitbit's actions constituted actual fraud and deceit as defined by Cal. Civ. Code §§ 1572 and 1710.

140. Plaintiff justifiably relied to his detriment on the truth and completeness of Fitbit's material representations regarding the PurePulse Trackers. Class members are presumed to have relied upon Fitbit's misrepresentations and concealment of the true facts because those facts are material to a reasonable consumer's decision to purchase the PurePulse Trackers.

141. Fitbit's fraud and concealment was also uniform across all Class members; Fitbit concealed from everyone the true nature of the Heart Rate Defect in the PurePulse Trackers.

142. Plaintiff and Class members would not have agreed to purchase their PurePulse Trackers, or would have paid less for them, if they had not been deceived by Fitbit.

143. As a result of Fitbit's inducements, Plaintiff and Class members sustained actual damages including but not limited to not receiving a product that performs as promised and not receiving the benefit of the bargain of their PurePulse Tracker purchases.

144. Fitbit's conduct was systematic, repetitious, knowing, intentional, and malicious, and demonstrated a lack of care and reckless disregard for Plaintiff's and Class members' rights and interests. Fitbit's conduct thus warrants an assessment of punitive damages under Cal. Civ. Code § 3294 and other applicable states' laws, consistent with the actual harm it has caused, the reprehensibility of its conduct, and the need to punish and deter such conduct.

SIXTH CLAIM FOR RELIEF
Breach of Express Warranty

145. Plaintiff hereby incorporates by reference the allegations contained in the preceding paragraphs of this Complaint.

146. Plaintiff brings this cause of action for himself and on behalf of the Nationwide Class.

147. By advertising the heart rate function of the PurePulse Trackers, Fitbit expressly warranted to Plaintiff and Class members that the PurePulse Trackers would record heart rate accurately, even during exercise.

148. By way of non-exhaustive example, Fitbit represented that

a. the PurePulse Trackers provide "continuous, automatic . . . heart rate" monitoring which allows users to "maintain intensity";

b. "Surge tracks your heart rate all day and ***during exercise***" (emphasis added); and

c. Charge HR "is an advanced heart rate and activity-tracking wristband, built for all-day activity, ***workouts*** and beyond." (emphasis added).

149. Such statements became the basis of the bargain for Plaintiff and other Class members because such statements are among the facts a reasonable consumer would consider material in the purchase of a heart rate monitoring fitness product.

150. Fitbit breached this express warranty by delivering PurePulse Trackers that do not deliver as promised and fail to consistently record accurate heart rates, especially during exercise.

151. As a result of the foregoing breaches of express warranty, Plaintiff and other Class members have been damaged in that they purchased PurePulse Trackers that could not perform as warranted and did not receive the benefit of the bargain of their PurePulse Tracker purchases.

152. Plaintiff and Class members seek all damages permitted by law in an amount to be proven at trial.

SEVENTH CLAIM FOR RELIEF
Violations of the Magnuson-Moss Act – Implied Warranty,
15 U.S.C. § 2301, *et seq.*

153. Plaintiff hereby incorporates by reference the allegations contained in the preceding paragraphs of this Complaint.

154. Plaintiff brings this cause of action for himself and on behalf of the Nationwide Class.

155. The PurePulse Trackers are "consumer products" within the meaning of the Magnuson-Moss Warranty Act, 15 U.S.C. § 2301(1).

156. Plaintiff and Class members are "consumers" within the meaning of the Magnuson-Moss Warranty Act, 15 U.S.C. § 2301(3), because they are persons entitled under applicable state law to enforce against the warrantor the obligations of its express and implied warranties.

157. Fitbit is a "supplier" and "warrantor" within the meaning of the Magnuson-Moss Warranty Act, 15 U.S.C. § 2301(4)-(5).

158. Section 2310(d)(1) of Chapter 15 of the United States Code provides a cause of action for any consumer who is damaged by the failure of a warrantor to comply with a written or implied warranty.

159. Fitbit provided Plaintiff and the other Class members with an implied warranty of merchantability in connection with the purchase or lease of the PurePulse Trackers is an "implied warranty" within the meaning of the Magnuson-Moss Warranty Act, 15 U.S.C. § 2301(7). As a part of the implied warranty of merchantability, Fitbit warranted that the PurePulse Trackers would pass without objection in the trade as designed, manufactured, and marketed, and were adequately labeled.

160. Fitbit breached these implied warranties, as described in more detail above, and are therefore liable to Plaintiff and the Class pursuant to 15 U.S.C. § 2310(d)(1).

161. Any efforts to limit the implied warranties in a manner that would exclude coverage of the PurePulse Trackers is unconscionable, and any such effort to disclaim, or otherwise limit, liability for the PurePulse Trackers is null and void.

162. Plaintiff and the other Class members have had sufficient direct dealings with either Fitbit or its agents to establish privity of contract.

163. Nonetheless, privity is not required here because Plaintiff and other Class members are intended third-party beneficiaries of contracts between Fitbit and its retailers, and specifically, of the implied warranties. The retailers were not intended to be the ultimate consumers of the PurePulse Trackers and have no rights under the warranty agreements provided with the PurePulse Trackers; the warranty agreements were designed for and intended to benefit consumers.

164. Pursuant to 15 U.S.C. § 2310(e), Plaintiff is entitled to bring this class action and is not required to give Fitbit notice and an opportunity to cure until such time as the Court determines the representative capacity of Plaintiff pursuant to Rule 23 of the Federal Rules of Civil Procedure.

165. Furthermore, to the extent such notice is required, it has been provided through the letter sent to Fitbit by Plaintiff's counsel on November 16, 2015 (Ex. 2), described herein, as well as through complaints lodged by Plaintiff McLellan and other Class members. Fitbit refused to remedy its wrongs after receiving these notifications and any further notice would be futile.

166. Plaintiff's individual claims place into controversy an amount equal to or exceeding $25.00. The amount in controversy of this entire action exceeds the sum of $50,000.00, exclusive of interest and costs, computed on the basis of all claims to be determined in this lawsuit. Plaintiff, individually and on behalf of the other Class members, seeks all damages permitted by law in an amount to be proven at trial.

167. In addition, pursuant to 15 U.S.C. § 2310(d)(2), Plaintiff and the other Class members are entitled to recover a sum equal to the aggregate amount of costs and expenses (including attorneys' fees based on actual time expended) determined by the Court to have reasonably been incurred by Plaintiff and the other Class members in connection with the commencement and prosecution of this action.

168. Further, Plaintiff and the Class are also entitled to equitable relief under 15 U.S.C. § 2310(d)(1).

EIGHTH CLAIM FOR RELIEF
Violations of the Arizona Consumer Fraud Act,
Arizona Rev. Stat. § 44-1521, *et seq.*

169. Plaintiff Dunn hereby incorporates by reference the allegations contained in the preceding paragraphs of this Complaint.

170. As described above, California law applies to the claims of all Plaintiff and Class members. In the alternative, Plaintiff Dunn brings this cause of action for himself and on behalf of the Arizona Subclass, and reserves the right to bring additional and/or different state-law claims should the Court determine that California law does not apply to all Class members.

171. Fitbit and the Arizona Subclass members are "persons" within the meaning of the Arizona Consumer Fraud Act ("Arizona CFA"), Ariz. Rev. Stat. § 44-1521(6).

172. The PurePulse Trackers are "merchandise" within the meaning of Ariz. Rev. Stat. § 44-1521(5).

173. The Arizona CFA provides that "[t]he act, use or employment by any person of any deception, deceptive act or practice, fraud, . . . misrepresentation, or concealment, suppression or omission of any material fact with intent that others rely on such concealment, suppression or omission, in connection with the sale . . . of any merchandise whether or not any person has in fact been misled, deceived or damaged thereby, is declared to be an unlawful practice." Ariz. Rev. Stat. § 44-1522(A).

174. In the course of its business, Fitbit willfully failed to disclose and actively concealed the Heart Rate Defect in the PurePulse Trackers as described herein and otherwise engaged in activities with a tendency or capacity to deceive. Fitbit also engaged in unlawful trade practices by employing deception, deceptive acts or practices, fraud, misrepresentations, or concealment, suppression or omission of any material fact with intent that others rely upon such concealment, suppression or omission, in connection with the sale of PurePulse Trackers.

175. As alleged above, Fitbit made material statements about the characteristics and efficacy of the PurePulse Trackers that were either false or misleading.

176. Fitbit knew, should have known, or was reckless in not knowing that its products did not have the qualities, characteristics, and functions it represented, warranted, and advertised them to have.

177. Fitbit owed the Arizona Subclass a duty to disclose the defective nature of PurePulse Trackers, including the Heart Rate Defect because it:

a. Possessed exclusive knowledge of the Heart Rate Defect in the PurePulse Trackers;

b. Intentionally concealed the Heart Rate Defect in the PurePulse Trackers through their deceptive marketing campaign; and/or

c. Made incomplete representations about the characteristics of the PurePulse Trackers, while purposefully withholding material facts from the Arizona Subclass that contradicted these representations.

178. Fitbit's unfair or deceptive acts or practices were likely to deceive reasonable consumers, including the Arizona Subclass, about the true characteristics of the PurePulse Trackers. Fitbit intentionally and knowingly misrepresented material facts regarding the PurePulse Trackers with intent to mislead the Arizona Subclass.

179. The inability of the PurePulse Trackers to consistently record accurate heart rates, even during exercise, was material to the Arizona Subclass. Had the Arizona Subclass known of the Heart Rate Defect, they would either not have purchased their PurePulse Trackers, or would have paid less for them than they did.

180. All members of the Arizona Subclass suffered ascertainable loss caused by Fitbit's failure to disclose material information. The Arizona Subclass did not receive the benefit of their bargain.

181. The Arizona Subclass members risk irreparable injury as a result of Fitbit's acts and omissions in violation of the Arizona CFA, and these violations present a continuing risk to the Arizona Subclass as well as to the general public. Fitbit's unlawful acts and practices complained of herein affect the public interest.

182. As a direct and proximate result of Fitbit's violations of the Arizona CFA, Plaintiff Dunn and the Arizona Subclass have suffered injury-in-fact and/or actual damage.

183. The Arizona Subclass seeks monetary relief against Fitbit in an amount to be determined at trial. The Arizona Subclass also seeks punitive damages because Fitbit engaged in aggravated and outrageous conduct with an evil mind.

184. The Arizona Subclass also seeks an order enjoining Fitbit's unfair, unlawful, and/or deceptive practices, attorneys' fees, and any other just and proper relief available under the Arizona CFA.

PRAYER FOR RELIEF

Plaintiff, individually and on behalf of all others similarly situated, requests the Court to

enter judgment against Fitbit, as follows:

A. an order certifying appropriate Classes and/or Subclasses, designating Plaintiff as Class Representative, and designating his counsel of record as Class Counsel;

B. an order enjoining Fitbit from engaging in further deceptive distribution and sales practices with respect to the PurePulse Trackers;

C. a declaration that Fitbit is financially responsible for notifying all Class members about the true nature of the PurePulse Trackers;

D. an order requiring Fitbit to notify the Class that the PurePulse Trackers are defective and cannot consistently record accurate heart rates;

E. an order permitting Plaintiff and Class members to elect to affirm their contracts or alternatively demand rescission and seek damages;

F. a declaration that the Fitbit must disgorge, for the benefit of Plaintiff and Class members, all or part of the ill-gotten profits received from the sale or lease of the PurePulse Trackers, and make full restitution to Plaintiff and Class members;

G. restitution in the amount of monies paid by Plaintiff and Class members for the PurePulse Trackers;

H. an award to Plaintiff and Class members of compensatory, exemplary, punitive, and statutory penalties and damages as allowed by law, including interest, in an amount to be proven at trial;

I. an award of attorneys' fees and costs, as allowed by law;

J. an award of pre-judgment and post-judgment interest, as provided by law;

K. leave to amend this Complaint to conform to the evidence produced at trial; and

L. such other relief as may be appropriate under the circumstances.

DEMAND FOR JURY TRIAL

Pursuant to Federal Rule of Civil Procedure 38(b), Plaintiff, individually and on behalf of the Class, demand a trial by jury of any and all issues in this action so triable of right.

Dated: June 19, 2018

Respectfully submitted,

LIEFF CABRASER HEIMANN & BERNSTEIN, LLP

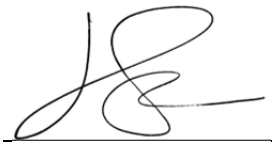
By: 
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EXHIBIT 1

Validation of the Fitbit® Surge™ and Charge HR™ Fitness Trackers

Authors: Edward Jo, PhD and Brett A. Dolezal, PhD

INTRODUCTION

This study was designed and executed to test the accuracy of the heart rate monitoring technology—PurePulse™—in fitness trackers manufactured by Fitbit, Inc. ("Fitbit") (together, the "devices" or the "PurePulse Trackers") over a wide range of activities and exercises. We tested both the Fitbit Charge HR™ ("Charge HR") and the Fitbit Surge™ ("Surge") by comparing hundreds of thousands of heart rate readings to a time-synced electrocardiogram ("ECG"). Based on our analysis of those readings, we conclude that the Fitbit PurePulse Trackers do not provide a valid measure of the users' heart rate and cannot be used to provide a meaningful estimate of a user's heart rate, particularly during moderate to high intensity exercise.

EXECUTIVE SUMMARY AND INTERPRETATION

1. The Charge HR exhibited an aggregate mean bias of -6.1 beats per minute (bpm) and a mean absolute differential of 12.2 bpm. During higher exercise intensities, the mean bias was -12.5 bpm and the mean absolute difference increased to 15.5 bpm. In other words, during moderate to high intensity exercise, the Charge HR recorded a heart rate that differed from the ECG by an average of 15.5 bpm.

2. The Surge exhibited a mean bias of -11.6 bpm and a mean absolute differential of 15.6 bpm. During higher exercise intensities, the mean bias was -20.8 bpm and the mean absolute differential increased to 22.8 bpm. In other words, during moderate to high intensity exercise, the Surge recorded a heart rate that differed from the ECG by an average of 22.8 bpm.

3. Together, the PurePulse Trackers exhibited an aggregate mean bias of -8.9 bpm and a mean absolute differential of 13.9 bpm when compared against ECG. During higher exercise intensities (as described above), the mean bias was -16.8 and the mean absolute difference increased to 19.2 bpm. In other words, during moderate to high intensity exercise during higher intensities of exercise, the PurePulse Trackers recorded a heart rate that differed from the ECG by an average of 19.2 bpm.

4. In addition to being inaccurate, the PurePulse Trackers are also inconsistent. Statistical analysis indicated a correlation strength of r= 0.85 between the time-synced Surge and Charge HR heart rates in aggregate. There was a mean differential of 10.0 bpm between the PurePulse Trackers. However, when comparing the trackers using data above the combined mean value of 124 bpm (i.e. heart rate range associated with lower intensity exercise), the correlation between the PurePulse Trackers weakened substantially to r= 0.46 demonstrating greater inconsistencies between the two trackers. The mean differential increased to 12.5 bpm. The correlation during rest and low intensity conditions (<125 bpm) also showed inconsistent heart rate measurements between the two device with only a moderate strength correlation (r= 0.76) and a mean difference of 7.23 bpm.

5. The PurePulse Trackers do not accurately measure a user's heart rate, particularly during moderate to high intensity exercise, and cannot be used to provide a meaningful estimate of a user's heart rate.

A. SPECIFIC AIMS

A.1. Specific Aim: In 43 healthy subjects, we tested the accuracy by which the Fitbit Surge and Charge HR wearable fitness trackers and the integrated PurePulse™ technology computes heart rate across a number of structured laboratory-based and less structured free-living exercise tasks.

A.2. Hypothesis: The result of this study is anticipated to determine the validity of the Fitbit Surge and Charge HR wearable fitness trackers for heart rate measurements in reference to the criterion measure electrocardiograph (ECG).

B. BACKGROUND AND SIGNFICANCE

Wearable physical activity monitors have been commercially available for many years[1]. Initially developed to augment personal fitness and weight loss regimens with basic quantitative data, the newest generation of devices provides feedback on many variables related to individuals' nutrition, exercise and sleep. As the technology and functionality of these devices continues to progress, the potential applications have also expanded to include medical surveillance, pervasive health care and mobile health-wellness monitoring.

The search for a practical and accurate method to assess energy expenditure continues to focus on wearable sensor technologies. It is believed that classification of physical activity by either improved analysis through accelerometer metrics or incorporating additional physiologic variables (e.g. body temperature, skin galvanic response, heart rate, etc.) may allow activity-specific prediction algorithms to more accurately reflect real-life energy expenditure. This has fueled the adoption of more recent commercially-available monitors using multiple-sensing technologies that have been shown to outperform existing monitors that use solely basic accelerometer data to infer movement and subsequent energy expenditure[2].

The Fitbit Surge and Charge HR wearable fitness trackers are an example of a current generation device that integrates reflective photoplethysmography to compute heart rate. Fitbit's PurePulse™ feature is its proprietary heart rate monitoring system. We understand, but have not independently verified, that the heart rate monitoring technology in the PurePulse Trackers is identical.

As wearables become more prevalent, the accuracy of the physiological data they provide increases in importance. With the recent development of new types of sensors there has been a steady focus on improving overall device performance, i.e., reliability and validity of measurements. Notwithstanding, there is a scarcity of rigorous, scientifically-based validation studies on physiological measurement accuracy when compared to a gold-standard. These devices are no exception, hence this study's proposed purpose is to compare heart rate (HR) measures and validate them against a criterion measure (ECG).

C. RELEVANT & PREVIOUS VALIDATION STUDIES[1]

C.1. Validation of wearable multi-sensor biofeedback technology for heart rate and energy expenditure tracking. Jo E, Dolezal BA, Lewis K, Directo D. (in preparation for publication).

Our laboratory conducted a validation study on two multi-sensor activity trackers used to monitor heart rate (via optical sensors) and energy expenditure (via multi-sensor technology). Subjects performed a series of exercise tasks while heart rate data was simultaneously acquired from the Basis Peak, Fitbit Charge HR, and ECG (criterion measure). The Basis Peak demonstrated strong correlation (r=0.92) with ECG and a mean bias of -2.53 bpm when examining data in aggregate. The Basis Peak maintained relatively excellent accuracy across all exercise tasks, and met the validation criteria for consumer-use heart rate monitors.

[1] Per Federal Rule of Civil Procedure 26(a)(2), the CVs and list of relevant publications of Drs. Jo and Dolezal are attached as Exhibits A and B. Neither Dr. Jo nor Dr. Dolezal has previously testified as an expert. The fees paid for this study include $21,750 to Dr. Jo, $12,000 to Dr. Dolezal, and $2,000 to a laboratory assistant. Costs and supplies, including participation fees for the study subjects, totaled $8,100.

C.2. Validity of two commercial grade bioelectrical impedance analyzers for measurement of body fat percentage. Dolezal BA, Lau M, Abrazado M, Storer TW, Cooper CB. Journal of Exercise Physiology online 2013; 16(4): 74-83

Our laboratory has validated an octapolar, multi-frequency bioelectrical impedance analyzer (BIA) against the gold standard of dual x-ray absorptiometry (DXA) in the assessment of body composition (% body fat). Correlations with DXA were extremely strong (r=0.98) and the data suggest this BIA instrument offers superior accuracy compared with other methods of BIA in assessing percent body fat.

C.3. Validation of a Heart Rate Derived from a Physiological Status Monitor-Embedded Compression Shirt against Criterion ECG. Dolezal BA, Boland DM, Carney J, Abrazado M, Smith DL, Cooper CB. Journal of Occupational and Environmental Hygiene 2014; 11:12, 833-39

Our laboratory has validated a Physiological Status Monitor (PSM)-embedded compression shirt against a criterion standard laboratory ECG in the measurement of heart rate when worn concurrently with structural firefighting personal protective equipment during four simulated firefighting activities. These findings demonstrated that the PSM-embedded compression shirt provides a valid measure of HR during simulated firefighting activities when compared with a standard 12-lead ECG.

D. METHODS

D.1. Study Design: This investigation was a prospective study of 43 healthy adults (22 males and 21 females) within the Los Angeles and Orange County communities. Participants visited the Cal Poly Pomona (CPP) Human Performance Research Laboratory for a single visit. An initial assessment included anthropometric measures (height and body weight) after which subjects were fitted with a Fitbit Charge HR on one wrist and the Fitbit Surge on the opposite wrist. Half of the subject pool wore the Charge HR on the dominant wrist and the Surge on the non-dominant wrist. The other half of the subject pool wore the Charge HR on the non-dominant wrist and the Surge on the dominant wrist. This counterbalancing strategy was implemented to avoid any potential confounding factors associated with the wrist on which the devices were placed. The mobile application settings for each watch were adjusted appropriately for each subject and the wrist the device was worn. Each device was fitted according to manufacturer instructions and with full battery charge prior to testing. A previously validated and calibrated heart rate measurement system (Zephyr Technology, BioHarness) accompanied with electrocardiograph (ECG) was used to provide criterion measures of HR using ECG R-R intervals[8,9]. The BioHarness has been previously validated with high agreement to 12-lead and 3-lead ECG[8,9]. The two Fitbit devices were time synchronized with the criterion ECG measurement. Time-synced data acquisition methods for each device is described below in section D.3.3.

The subjects were assigned to perform the tasks below in the listed order for 5 minutes while heart rate data from each device (ECG, Charge HR, and Surge) were concurrently acquired. The total time of testing was 65 minutes for each subject. The exercise tasks were reflective of activities presented in Fitbit advertisements.

Free-living Setting (outdoors)

1. **Standing Rest**
2. **Self-paced jog:** Participants will jog on a predetermined course consisting of flat and hilly surfaces.
3. **Standing Rest**
4. **Jump roping:** Participants will jump rope at a self-selected cadence.

Laboratory Setting

1. **Seated Rest**
2. **Treadmill Jogging:** Participants will jog at a self-selected pace a motorized treadmill (4.5 to 5.9 mph).

3. **Seated Rest**
4. **Treadmill Running:** Participants will run at a self-selected pace a motorized treadmill (> 6.0 mph).
5. **Seated Rest**
6. **Stair Climbing:** Participants will walk, jog, or run up a flight of stairs and return repeatedly for 1 minute intervals up to 5 minutes total.
7. **Seated Rest**
8. **Plyometrics:** Participants will perform 5 minutes of various plyometric (fast movement) exercises with each exercise performed in 1 minute intervals.
9. **Seated Rest**

D.2. Subjects: A randomized sample of 43 subjects (21 males and 22 females) was utilized for this study. The mean age, body weight, and height of the subject pool was 23.23 ± 3.46 years, 168.43 ± 9.76 kg, and 70.05 ± 14.33 cm, respectively. Recruitment of subjects was performed by posting flyers on the CPP campus as well as by mass email solicitations. Interested individuals were provided with a full overview of the study procedures as well as the study consent form. Informed consent was obtained after discussing the study procedures in detail, including the voluntary nature of participation and notification that the subject can withdraw at any time. Upon the subject's agreement to participate, a signed copy was given to the subject. The study was approved by the CPP Institutional Review Board. Individuals who reported or exhibited any significant medical diagnoses, including cardiovascular or pulmonary disease that may limit ability to exercise or increase the cardiovascular risk of exercising or confound the interpretation of results were excluded from participation.

D.3. Experimental Procedures

D.3.1. Screening: All subjects completed a pre-participation medical questionnaire (PAR-Q) and a habitual physical activity questionnaire.

D.3.2. Electrocardiograph (ECG): We used a previously-validated and calibrated heart rate measurement system (Zephyr Technology, BioHarness) accompanied with a single channel electrocardiograph (ECG) sensor and circuitry to provide criterion measures of HR using ECG R-R interval calculations at a sampling rate of 250 Hz[8,9]. The BioHarness is a wearable multi-sensor system that acquires, logs, visualizes, and transmits biometrics (e.g. ECG and HR) via Bluetooth-enabled devices and mobile computer application (app). Following all measurements, data stored on the app was uploaded to a secure server and subsequently downloaded for second-by-second HR data analysis. The BioHarness has been previously validated with high agreement to 12-lead and 3-lead ECG[8-9]. The rationale for using the BioHarness ECG sensor as opposed to a traditional 12-lead ECG is as follows: (1) a 12-lead ECG utilizes 10 electrodes placed on the upper torso mostly around the left (anatomical perspective) chest. Therefore, female subjects especially, may experience discomfort as partial disrobing would be required for electrode placement. The BioHarness system integrates ECG into a less cumbersome chest strap device that is placed underneath the pectoral region and does not require disrobing, and (2) with the dynamic nature of movements associated with the exercise tasks, the use of a wired 12-lead ECG would be highly impractical and unfeasible. R-R interval and HR data will be acquired wirelessly using native Android-based software.

D.3.3. Fitbit Charge HR and Surge: For each subject, we positioned the Charge HR and Surge of appropriate size on separate wrists and in accordance to manufacturer instructions. Half of the subject pool wore the Charge HR on the dominant wrist and the Surge on the non-dominant wrist. The other half of the subject pool wore the Charge HR on the non-dominant wrist and the Surge on the dominant wrist. We implemented this counterbalancing strategy to avoid any potential confounding factors associated with the wrist on which the devices are placed. The mobile application settings for each watch were adjusted appropriately for each subject. Each device was confirmed to have full battery charge prior to testing. During testing, the "track exercise" function for the Fitbit devices was used. This function allows for time-synced GPS and HR data acquisition. Upon completion of the testing protocol, the exercise metrics during the "tracked" exercise was uploaded to the Fitbit servers. Subsequently, the GPS (.tcx) file linked to the "tracked" exercise was downloaded from the Fitbit online dashboard and imported into a Microsoft

Excel spreadsheet. The spreadsheet displayed time-synced, second-by-second GPS and HR data. The GPS data was discarded while the HR data was subsequently used for analysis.

D.3.4. Time Syncing and Data Processing: All time stamps corresponding to each HR measurement from each device were linked to Coordinated Universal Time (UTC). The start and end times for each testing session were recorded and used to identify the time/data points for analysis. For some subjects, the Fitbit data sets failed to register a variable number of time points. This may be due to incidences during which the Fitbit device failed to capture a sufficient signal for HR determination. Because the precise reason for these absent heart rate readings cannot be conclusively determined, these data points were not included in the primary analysis. As a secondary method of data acquisition, we recorded heart rate data manually using the value presented on the watch interface. At each minute of testing, the subject was prompted to read the heart rate value indicated on the Charge HR watch interface and researchers hand recorded the data. Simultaneously, researchers recorded the heart rate value presented on the external monitors linked to the ECG as well as on the Surge. This secondary method serves as an alternate approach and may provide value for practical inference since consumers utilize similar procedures to obtain their own heart rate values.

D.3.5. Statistical Analyses: Three levels of statistical analysis were implemented to substantiate the level of validity of the Fitbit devices in reference to ECG:

A) First, we used a Pearson Product-Moment Correlation analysis to determine the strength of relationship between ECG and each of the Fitbit devices (i.e. ECG vs. Charge HR and ECG vs. Surge) and whether the relationship was statistically significant. A significant correlation was determined if the p-value was less than 0.05 while the strength of correlation was determined by the correlation coefficient (r).

**In simplified terms, a correlation analysis would provide information on how well or poorly the heart rate values from the Fitbit relate to the values acquired by ECG for each given time point of measurement. A perfect correlation (represented by an r-value of 1) indicates that the heart rate values from the Fitbit and ECG were the same for each measurement time point. This would indicate that the Fitbit is completely accurate in reference to the ECG. When the heart rate values from the Fitbit and ECG do not match well for each time point, the strength of the correlation weakens (represented by a r-value further away from 1 and closer to 0). The term "significance" is a statistical term that simply indicates that the observed correlation was not simply due to chance. In this case, the data reveals that the Fitbit devices are inaccurate.*

By itself, however, this metric can conceal significant discrepancies in heart rate readings. For example, if an ECG records bpm of 150, 160, and 170 at three discrete moments in time, and a Fitbit device records bpm of 100, 110, and 120, respectively, for those same moments, the devices would demonstrate a perfect correlation,(r= 1.0) even though the actual readings were far apart. Thus, even if the correlation is strong, other means must be referenced as well to determine the devices' validity.

B) Second, we used a paired sample T-Test to statistically compare the mean/average heart rate between ECG and each of the Fitbit devices. A $p<0.05$ will indicate a significant difference between the mean HR acquired by ECG vs. either Fitbit device.

**This statistical test is intended to compare the average heart rate from the ECG to the average heart rate value from the Fitbit devices. If the two mean values differed significantly (i.e. statistical significance represented by a p-value less than 0.05), it may be implied from a statistical perspective that the two devices produce discrepant heart rate values.*

By itself, this analytical tool can also undervalue the inaccuracy of the devices. For example, if an ECG shows bpm of 150, 150, 150, and 150, and the Fitbit device shows bpm of 125, 125, 175, and 175 for the same points in time, the

device would register a mean bias of 0 over this time period, notwithstanding the significant inaccuracy of each reading. Thus, where, as here, the Fitbit devices have a tendency to both under record, and over record, the mean bias may underestimate the extent of the inaccuracy.

C) Third, we used the Bland-Altman method to further assess the agreement between the Fitbit devices and ECG and whether the differences vary in a systematic or ambiguous way over the range of measurements. The mean bias between Fitbit and ECG (=Fitbit HR – ECG HR) and the 95% limits of agreement (LoA; LoA = mean difference ± 1.96 standard deviation of the difference) was identified. Bland-Altman plots demonstrate the Fitbit vs. ECG (Fitbit HR minus ECG HR) heart rate difference scores against the mean of the heart rate measurements from both Fitbit and ECG.

**This analysis provides insight on how well or poorly the Fitbit agrees with ECG in terms of heart rate. More specifically, the mean bias is calculated by subtracting ECG HR from the time-corresponding Fitbit HR and then averaging those computed values. The mean bias score will indicate how much the Fitbit underestimates or overestimates (bias) heart rate in reference to ECG. The 95% limits of agreement incorporate an upper and lower value. This range encompasses 95% of the individual difference scores (= Fitbit HR – ECG HR) within the sample. This can provide information as to the range by which the Fitbit deviates from ECG. Moreover, the range may reflect the tendencies of the Fitbit in terms of heart rate measurement. For example, if the upper limit of agreement is +10 and the lower limit of agreement is -45, then it can be reasonably argued that the Fitbit tends to underestimate since -45 is further away from 0 (0= no difference between devices) than +10. Also, a bias may be considered systematic if the limits of agreement were closer together. In such case, the Fitbit may be used interchangeably with ECG since 95% of the individual difference scores are within a relatively small range. If the limits of agreement were wide, then the bias is more ambiguous or sporadic. In this case, the Fitbit may not be considered interchangeable with ECG since the bias is not systematic.*

D) Fourth, we calculated the absolute difference between the Fitbit devices and the ECG.

**This measurement describes the difference in bpm between the Fitbit devices and the ECG, irrespective of whether the devices recorded a bpm over or under the actual heart rate, as measured by an ECG. For example, if an ECG records a heart rate of 125, Fitbit device readings of 100 and 150 would both render an absolute difference of 25 bpm.*

All four levels of analysis were implemented on aggregate HR data, HR data above the mean ECG HR, and HR data below the mean ECG HR. For ECG vs. Charge HR analysis, a total of 127,215 pairs of data were utilized while for the ECG vs. Surge analysis, a total of 132,263 pairs of data were utilized. The discrepancy in data set size was due to incidences in which either Fitbit device failed to register a HR for a given time point as described above. All results are reflected as mean value ± standard deviation. Previous validation studies[8,9,11,12] have provided validity criteria for heart rate measurement as: 1) a standard error of the estimate (SEE) less than 5 beats/min, 2) a correlation between ECG-derived heart rate and the heart rate measured by the test device of r=0.90 or greater, and 3) a mean bias less than 3 beats/min. These criteria were used to determine validity of the Fitbit devices in this study.

E. RESULTS

E.1. ECG vs. Fitbit Charge HR

E.1.1. Aggregate Data: When examining all time-synced ECG and Charge HR heart rate data in aggregate (n= 127,215 pairs), there was a significant ($p<0.001$) and moderately strong positive correlation between ECG and Charge HR ($r=0.85$) (Table 1, Figure 1). The mean HR from the Charge HR (126.78 ± 29.94 bpm) significantly ($p<0.001$) differed from the mean ECG HR (132.87 ± 33.12 bpm) (discrepancy of 9.46 ± 10.62% or 12.19 ± 10.62 bpm) (Table 1). The Charge HR exhibited a mean bias of -6.09 ± 17.71 bpm (95% LoA 28.63, -40.81) in reference to ECG criterion measure (Table 1, Figure 2).

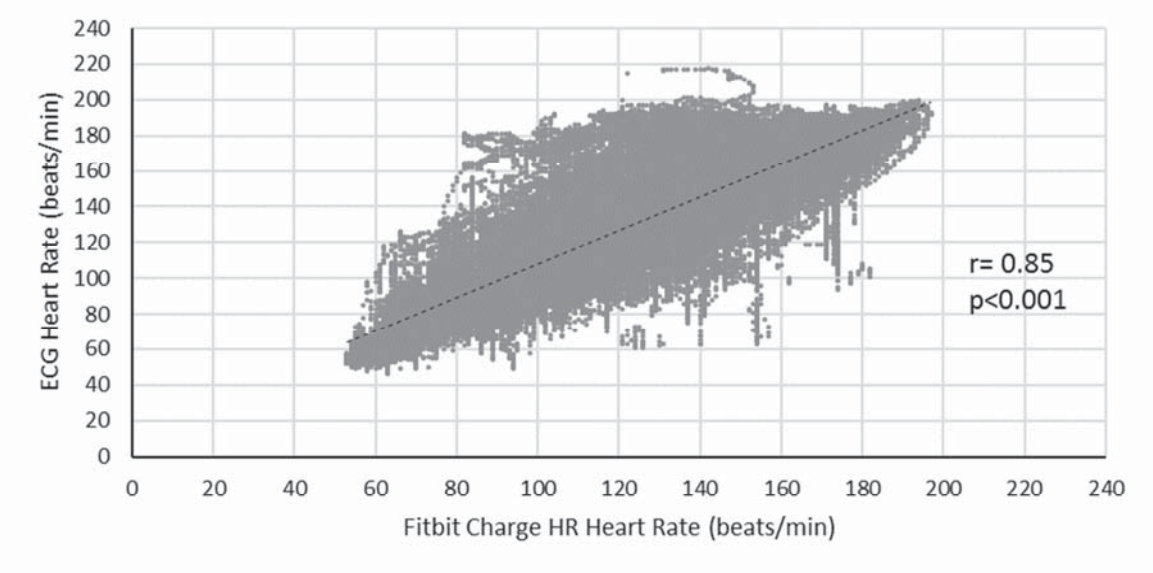

Figure 1. Relationship between time-synced ECG and Fitbit Charge heart rate.

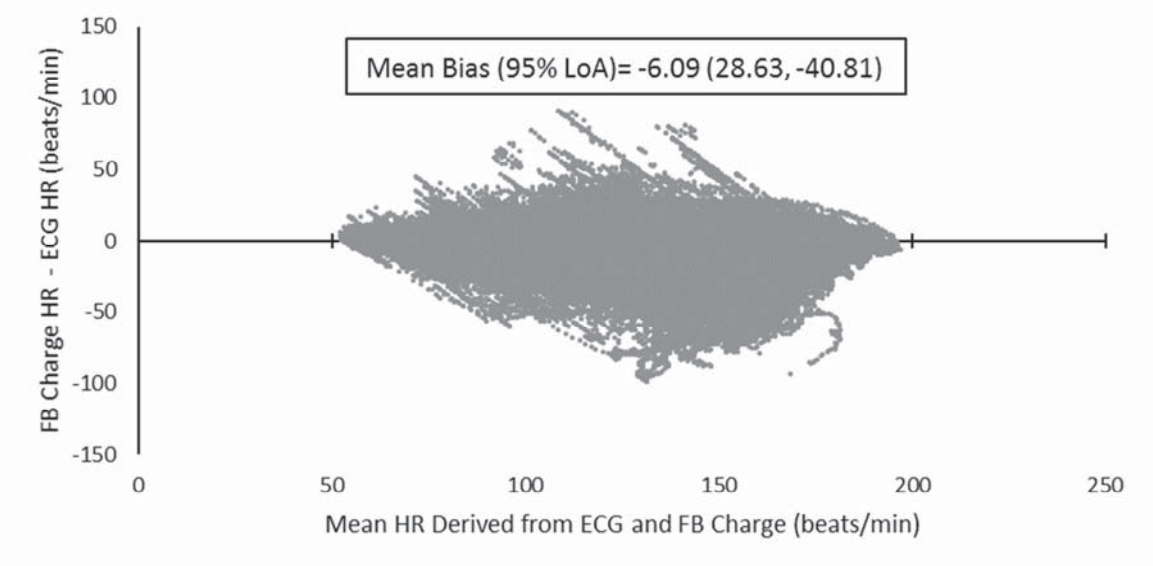

Figure 2. Bland-Altman Plot indicating mean difference in heart rate detection between the Charge HR and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

E.1.2. HR Data above mean ECG HR (>132 bpm): Time synced heart rate data above the mean ECG HR (>132 bpm; n=63,888 pairs) were analyzed. During conditions in which the ECG HR (true HR) exceeded 132 bpm, there was a significant ($p<0.001$) and moderately weak positive correlation between ECG and Charge HR ($r=0.48$) (Table 1, Figure 3). In addition, the mean HR from the Charge HR (148.35 ± 20.10 bpm) significantly ($p<0.001$) differed from the mean ECG HR (160.83 ± 17.03 bpm) (discrepancy of 10.35 ± 11.62% or 15.48 ± 11.62 bpm) (Table 1). The Charge HR exhibited a mean bias of -12.48 ± 19.07 bpm (95% LoA 24.90, -49.86) compared to ECG during higher (>132 bpm) ECG/true heart rate conditions (e.g. high intensity exercise) (Table 1, Figure 4).

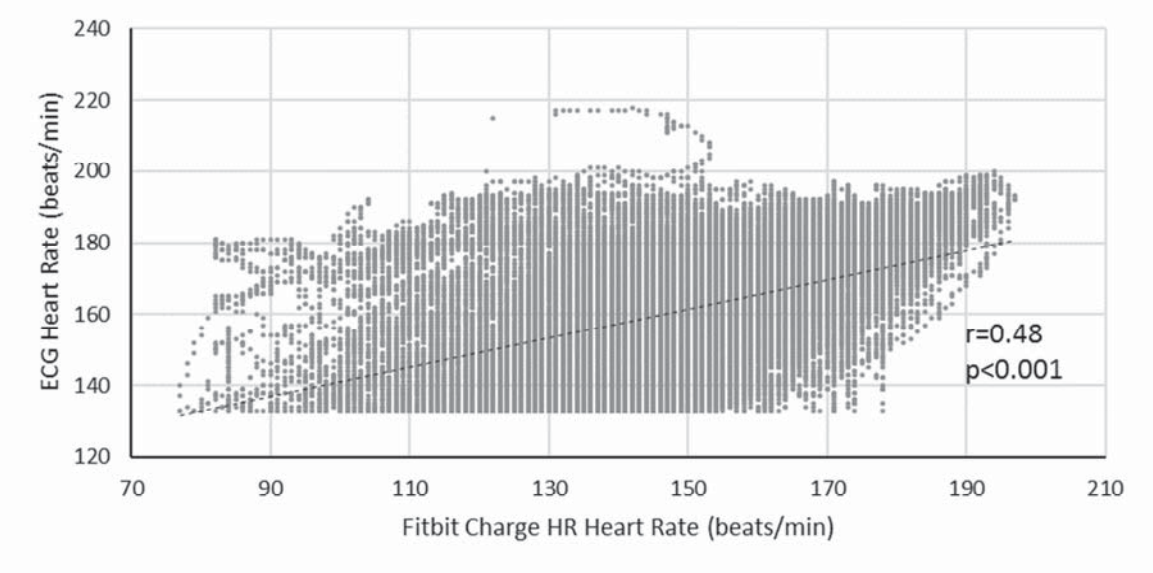

Figure 3. Relationship between time-synced ECG and Fitbit Charge heart rate during high ECG-measured heart rate range (>132 bpm)

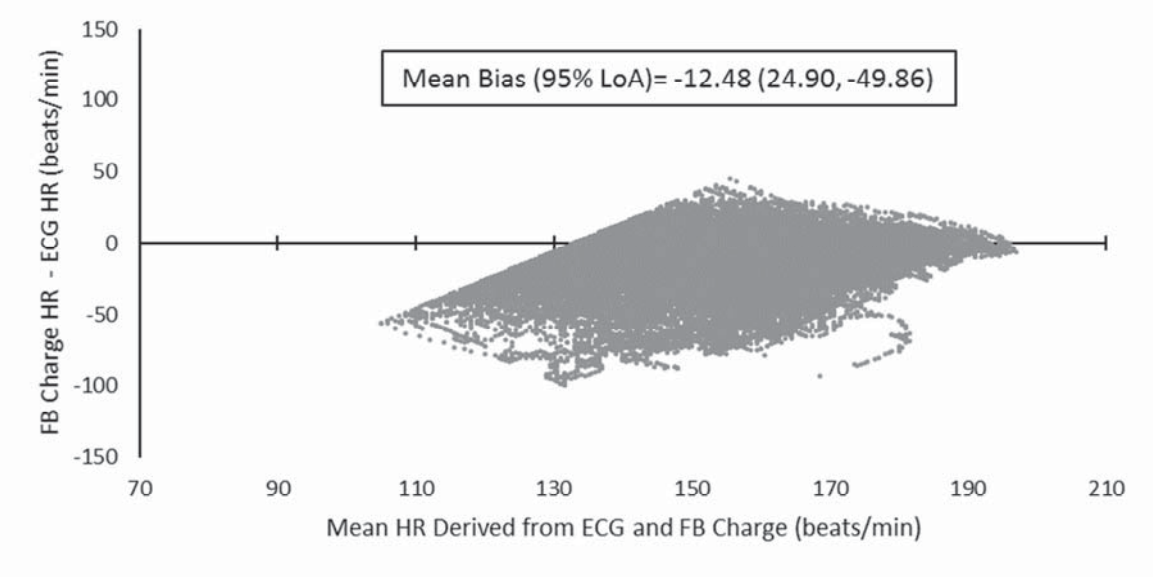

Figure 4. Bland-Altman plot indicating mean difference in heart rate detection between the Charge HR and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

E.1.3. HR Data below mean ECG HR (<133 bpm): Time synced heart rate data below the mean ECG HR (<133 bpm; n=63,327 pairs) were analyzed. During conditions in which the ECG HR (true HR) was below 133 bpm, there was a significant ($p<0.001$) and moderate positive correlation between ECG and Charge HR ($r=0.78$) (Table 1, Figure 5). In addition, the mean HR from the Charge HR (105.02 ± 21.22 bpm) significantly ($p<0.001$) differed from the mean ECG HR (104.67 ± 18.10 bpm) (discrepancy of 8.56 ± 9.42% or 8.86 ± 9.42 bpm) (Table 1). The Charge HR exhibited a mean bias of 0.36 ± 13.44 bpm (95% LoA 18.82, -18.13) compared to ECG during lower (<133 bpm) ECG/true heart rate conditions (e.g. low intensity exercise) (Table 1, Figure 6).

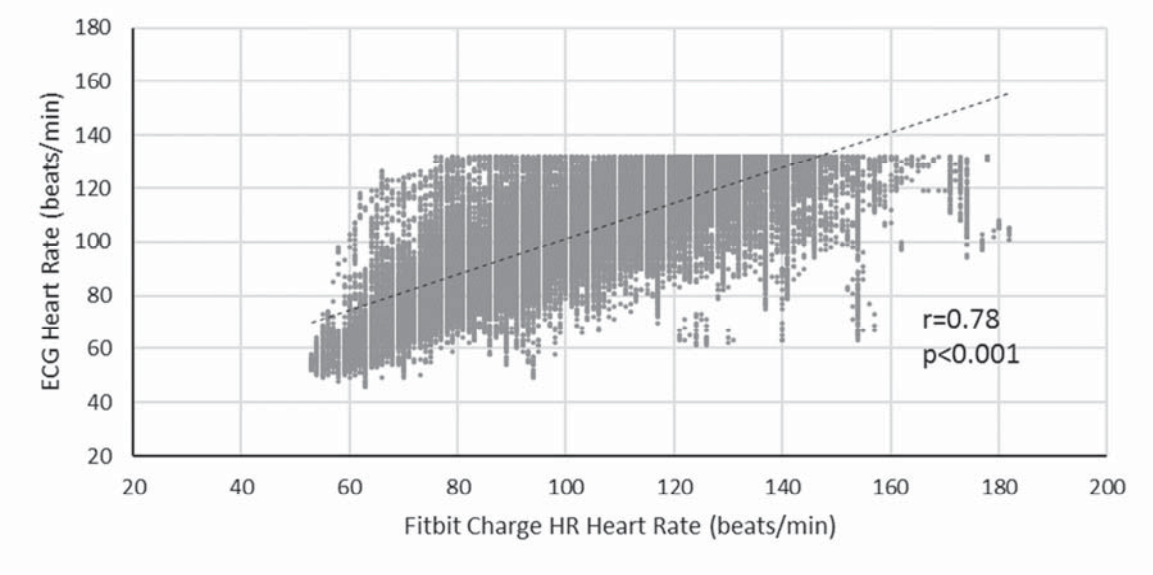

Figure 5. Relationship between time-synced ECG and Fitbit Charge heart rate during low ECG-measured heart rate range (<133 bpm)

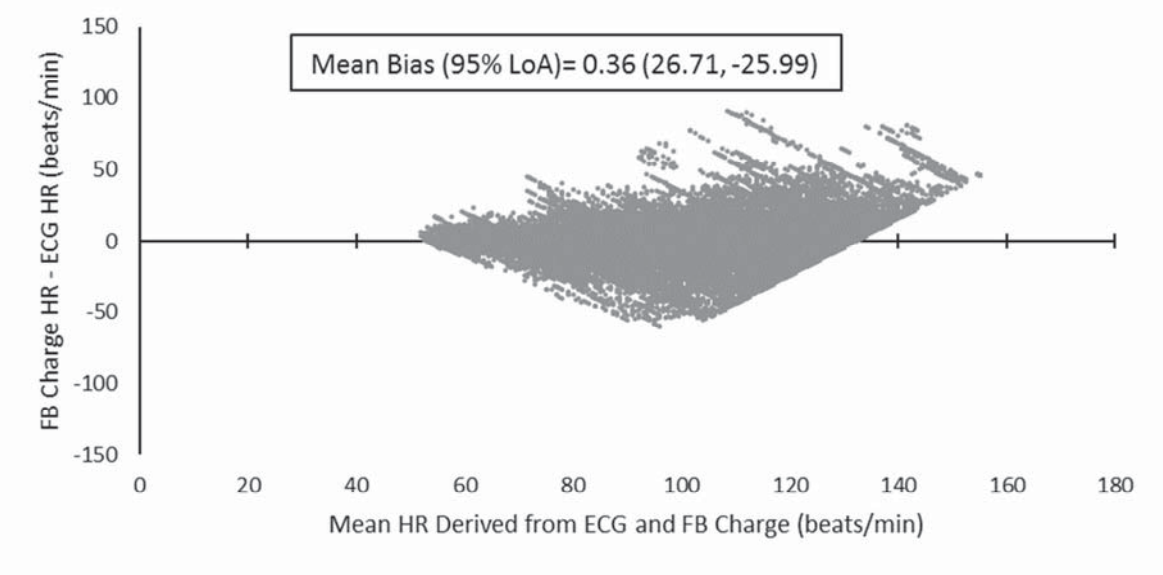

Figure 6. Bland-Altman plot indicating mean difference in heart rate detection between the Fitbit Charge HR (Charge HR) and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

Parameter	Aggregate Data (n=127,215)	Data above ECG HR >132bpm (n=63,888)	Data below ECG HR <133bpm (n=63,327)
Charge HR Mean HR (bpm ± SD)	126.78 ± 29.94*	148.35 ± 20.10*	105.02 ± 21.22*
ECG Mean HR (bpm ± SD)	132.87 ± 33.12	160.83 ± 17.03	104.67 ± 18.10
Mean Absolute Difference (bpm ± SD)	12.19 ± 10.62	15.48 ± 11.62	8.86 ± 9.42
Mean Percent Difference (% ± SD)	9.46 ± 10.62	10.35 ± 11.62	8.56 ± 9.42
Correlation (r)	0.85^	0.48^	0.78^
Mean Bias (bpm ± SD)	-6.09 ± 17.71 (95% CI -6.19, -5.99)	-12.48 ± 19.07 (95% CI -12.63, -12.33)	0.36 ± 13.44 (95% CI 0.25, 0.46)
95% Limits of Agreement (Upper, Lower)	28.63, -40.81	24.90, -49.86	26.71, -25.99
Standard Error of the Estimate (SEE)	15.92	17.61	13.35

^ Significant (p<0.001) correlation
* Significantly (p<0.001) different than ECG

Table 1. Summary of heart rate comparison data between Charge HR and ECG.

E.2. ECG vs. Fitbit Surge

E.2.1. Aggregate Data: When examining all time-synced ECG and Surge heart rate data in aggregate (n= 132,263 pairs), there was a significant (p<0.001) and moderately strong positive correlation between ECG and Surge (r=0.77) (Table 2, Figure 7). The mean HR from the Surge (121.58 ± 27.78 bpm) significantly (p<0.001) differed from the mean ECG HR (133.163 ± 32.64 bpm) (discrepancy of 11.98 ± 13.21% or 15.63 ± 13.21 bpm) (Table 2). The Surge exhibited a mean bias of -11.58 ± 21.03 bpm (95% LoA 29.64, -52.80) in reference to ECG criterion measure (Table 2, Figure 8).

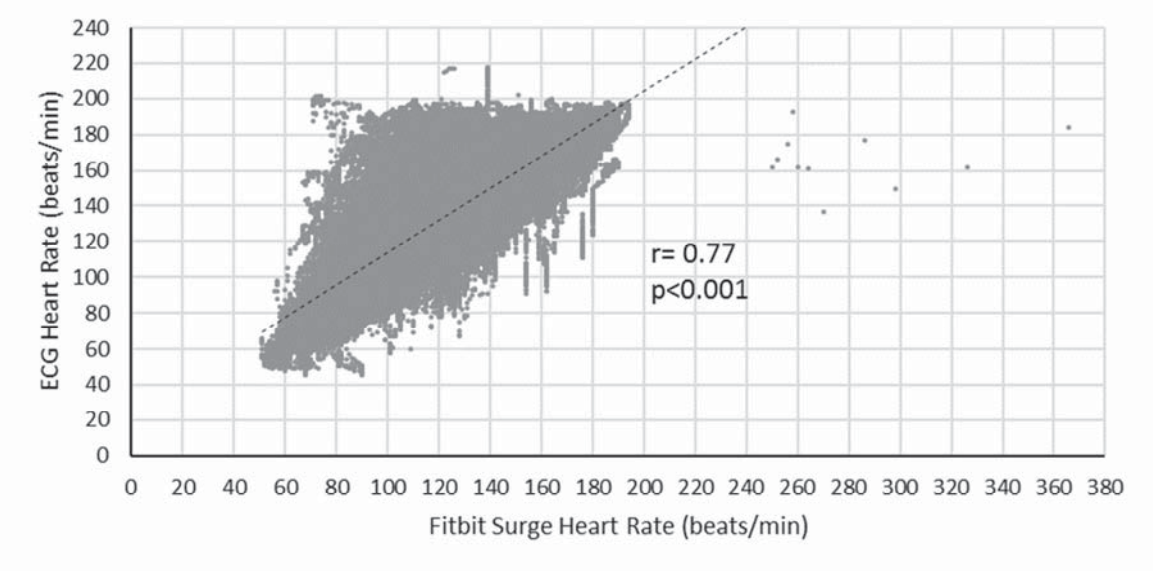

Figure 7. Relationship between time-synced ECG and Fitbit Surge heart rate.

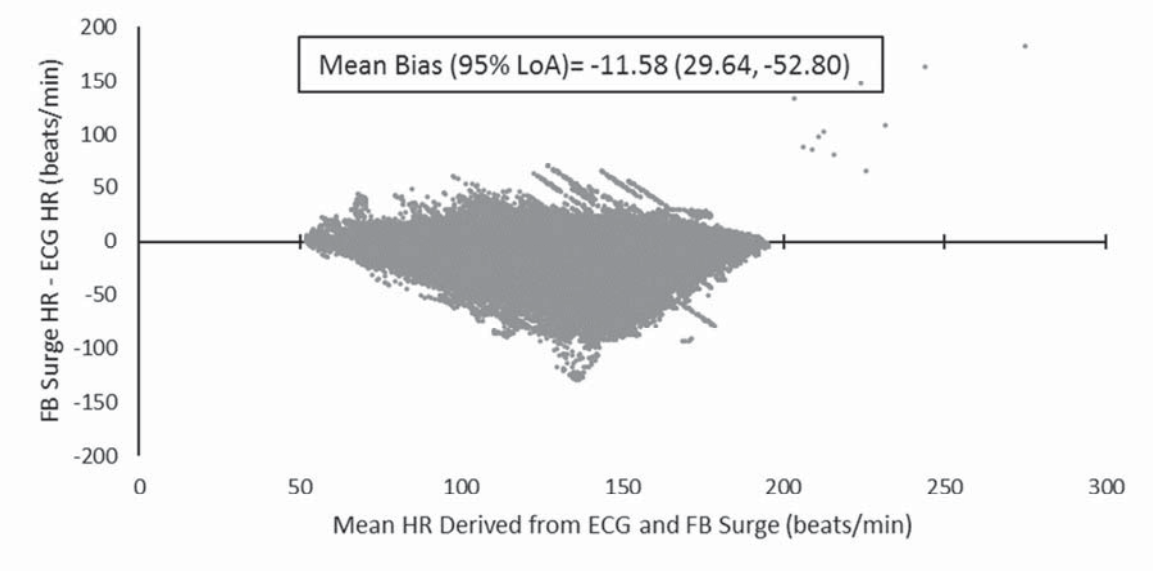

Figure 8. Bland-Altman plot indicating mean difference in heart rate detection between the Fitbit Surge and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

E.2.2. HR Data above mean ECG HR (>132 bpm): Time synced heart rate data above the mean ECG HR (>132 bpm; n=67,668 pairs) were analyzed. During conditions in which the ECG HR (true HR) exceeded 132 bpm, there was a significant ($p<0.001$) and weak positive correlation between ECG and Surge ($r=0.28$) (Table 2, Figure 9). In addition, the mean HR from the Surge (139.50 ± 22.00 bpm) significantly ($p<0.001$) differed from the mean ECG HR (160.308 ± 16.46 bpm) (discrepancy of 15.77 ± 15.53% or 22.75 ± 15.53 bpm) (Table 2). The Surge exhibited a mean bias of -20.81 ± 23.54 bpm (95% LoA 25.33, -66.95) compared to ECG during higher (>132 bpm) ECG/true heart rate conditions (e.g. high intensity exercise) (Table 2, Figure 9).

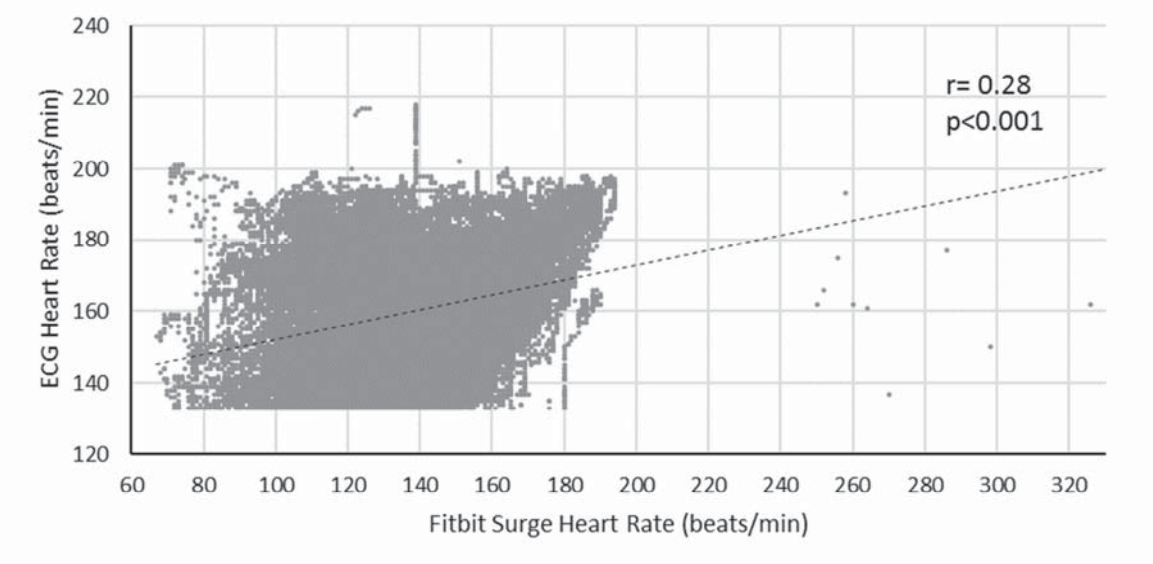

Figure 9. Relationship between time-synced ECG and Fitbit Surge heart rate during high ECG-measured heart rate range (>132 bpm)

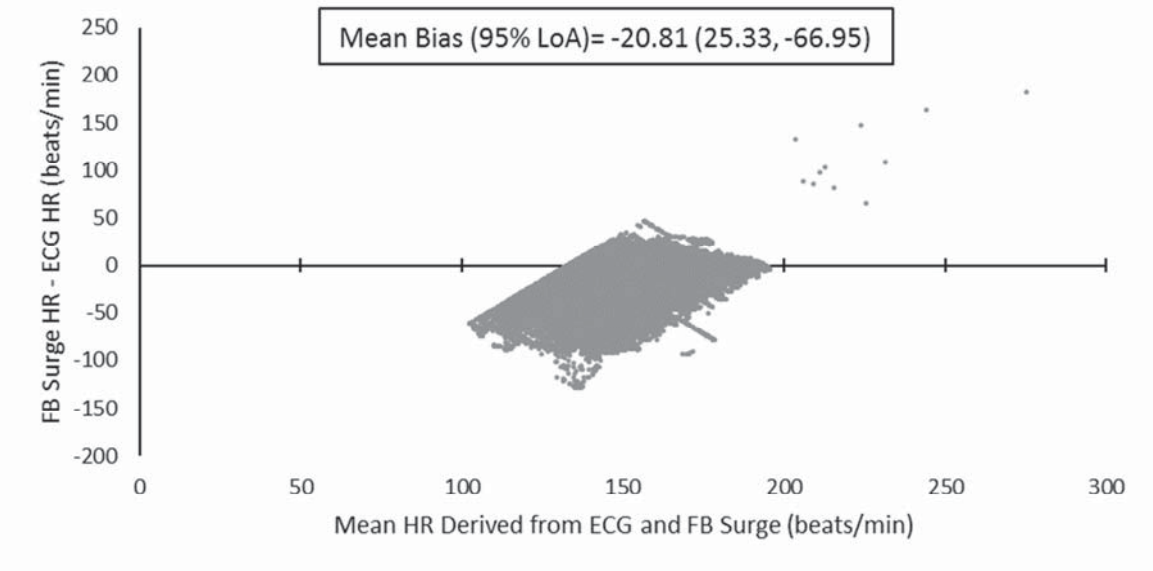

Figure 10. Bland-Altman plot indicating mean difference in heart rate detection between the Surge and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

E.2.3. HR Data below mean ECG HR (<133 bpm): Time synced heart rate data below the mean ECG HR (<133 bpm; n=64,620 pairs) were analyzed. During conditions in which the ECG HR (true HR) was below 133 bpm, there was a significant ($p<0.001$) and moderately strong positive correlation between ECG and Surge ($r=0.80$) (Table 2, Figure 11). In addition, the mean HR from the Surge (102.83 ± 19.61 bpm) significantly ($p<0.001$) differed from the mean ECG HR (104.74 ± 17.83 bpm) (discrepancy of 8.01 ± 8.60% or 8.17± 8.60 bpm) (Table 2). The Surge exhibited a mean bias of -1.91 ± 11.93 bpm (95% LoA 21.47, -25.30) compared to ECG during lower (<133 bpm) ECG/true heart rate conditions (e.g. low intensity exercise) (Table 2, Figure 12).

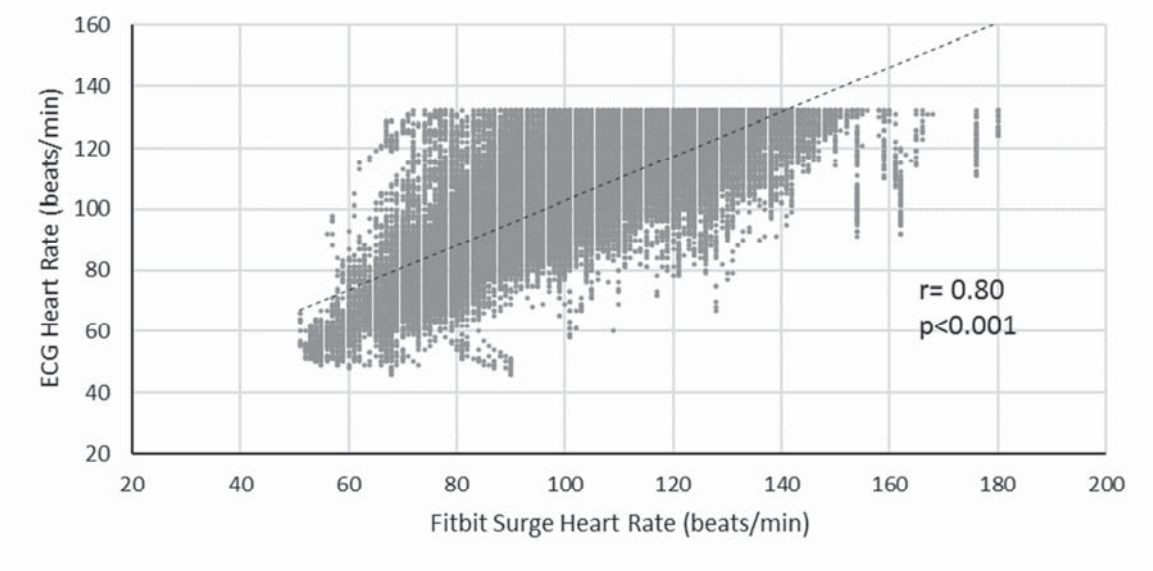

Figure 11. Relationship between time-synced ECG and Fitbit Surge heart rate during low ECG-measured heart rate range (<133 bpm)

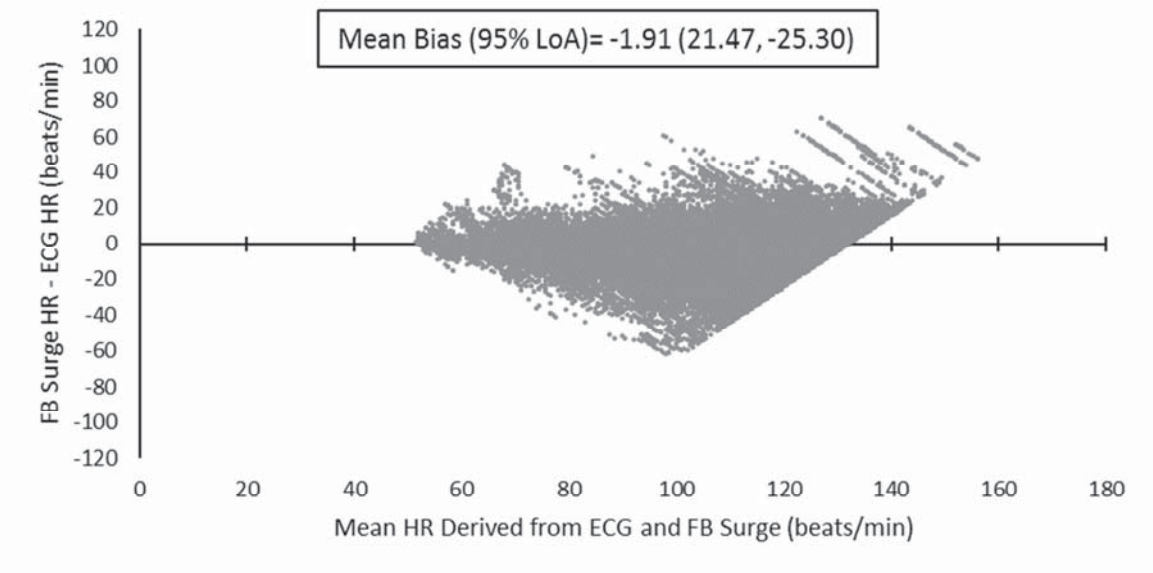

Figure 12. Bland-Altman plot indicating mean difference in heart rate detection between the Fitbit Surge and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

Parameter	Aggregate Data (n=132,263)	Data above ECG HR >132bpm (n=67,668)	Data below ECG HR <133bpm (n=63,327)
Surge Mean HR (bpm ± SD)	121.581 ± 27.78*	139.50 ± 22.00*	102.83 ± 19.61*
ECG Mean HR (bpm ± SD)	133.16 ± 32.64	160.31 ± 16.46	104.74 ± 17.83
Mean Absolute Difference (bpm ± SD)	15.63 ± 13.21	22.75 ± 15.53	8.17 ± 8.60
Mean Percent Difference (% ± SD)	11.98 ± 13.21	15.77 ± 15.53	8.01 ± 8.60
Correlation (r)	0.77^	0.28^	0.80^
Mean Bias (bpm ± SD)	-11.58 ± 21.03 (95% CI -11.70, -11.47)	-20.81 ± 23.54 (95% CI -20.00, -20.63)	-1.91 ± 11.94 (95% CI -2.01, -1.82)
95% Limits of Agreement (Upper, Lower)	29.64, -52.80	25.33, -66.95	21.47, -25.30
Standard Error of the Estimate (SEE)	17.75	21.14	11.74

^ Significant ($p<0.001$) correlation
* Significantly ($p<0.001$) different than ECG

Table 2. Summary of heart rate comparison data between Surge and ECG.

E.3. ECG vs. Fitbit Combined (PurePulse Trackers)

E.3.1. Aggregate Data: When examining all time-synced ECG and PurePulse Tracker data in aggregate (n= 259,478 pairs), there was a significant (p<0.001) and moderately strong positive correlation between ECG and PurePulse Trackers (r=0.80) (Table 3, Figure 13). The mean HR from the PurePulse Trackers (124.13 ± 28.97 bpm) significantly (p<0.001) differed from the mean ECG HR (133.02 ± 32.88 bpm) (discrepancy of 10.74 ± 12.08% or 13.94 ± 12.08 bpm) (Table 3). The PursePulse Trackers exhibited a mean bias of -8.89 ± 19.67 bpm (95% LoA 29.66, -47.44) in reference to ECG criterion measure (Table 2, Figure 14).

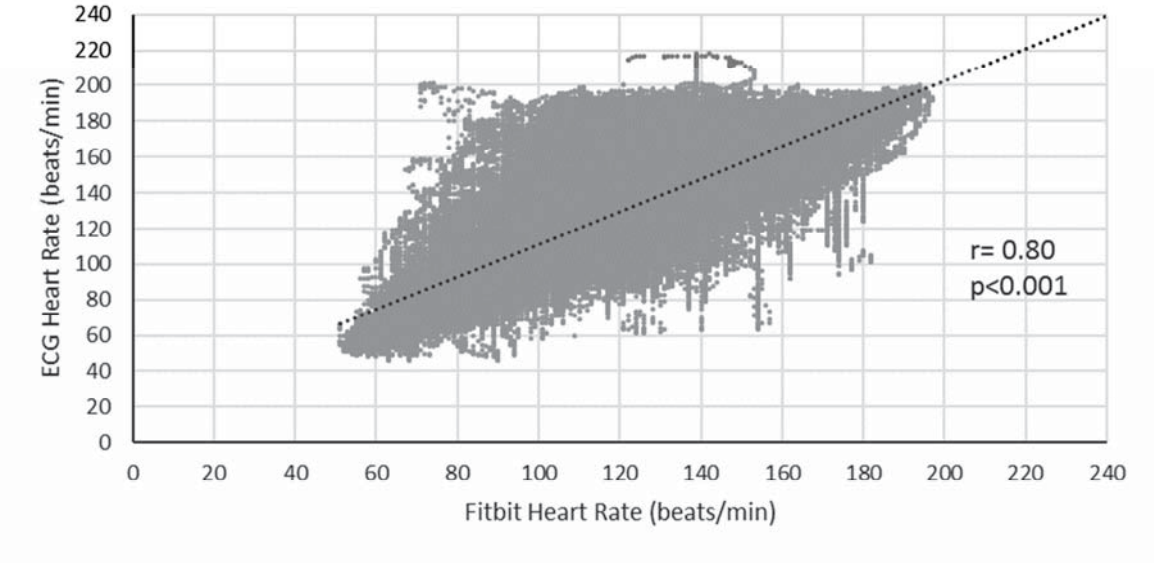

Figure 13. Relationship between time-synced ECG and PurePulse Tracker heart rate.

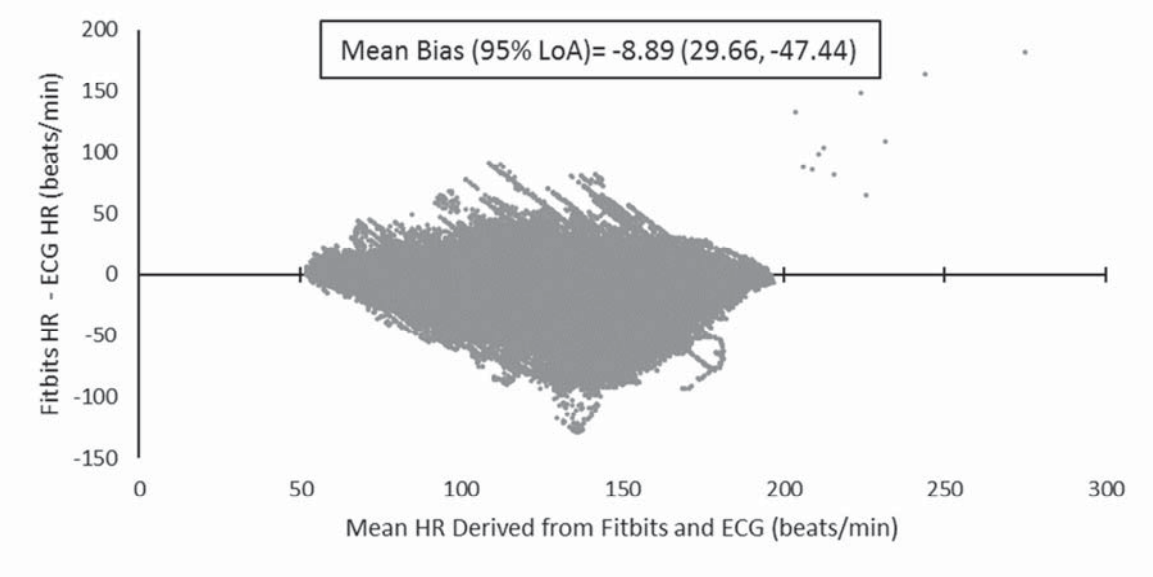

Figure 14. Bland-Altman plot indicating mean difference in heart rate detection between the PurePulse Trackers and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

E.3.2. HR Data above mean ECG HR (>132 bpm): Time synced heart rate data above the mean ECG HR (>132 bpm; n=131,531 pairs) were analyzed. During conditions in which the ECG HR (true HR) exceeded 132 bpm, there was a significant (p<0.001) and weak positive correlation between ECG and PursePulse Trackers (r=0.37) (Table 3, Figure 15). In addition, the mean HR

from the PurePulse Trackers (143.80 ± 21.56 bpm) significantly (p<0.001) differed from the mean ECG HR (160.57 ± 16.74 bpm) (discrepancy of 13.14 ± 14.04% or 19.22 ± 14.04 bpm) (Table 3). The PurePulse Trackers exhibited a mean bias of -16.77 ± 21.89 bpm (95% LoA 26.13, -59.67) compared to ECG during higher (>132 bpm) ECG/true heart rate conditions (e.g. higher intensity exercise) (Table 3, Figure 16).

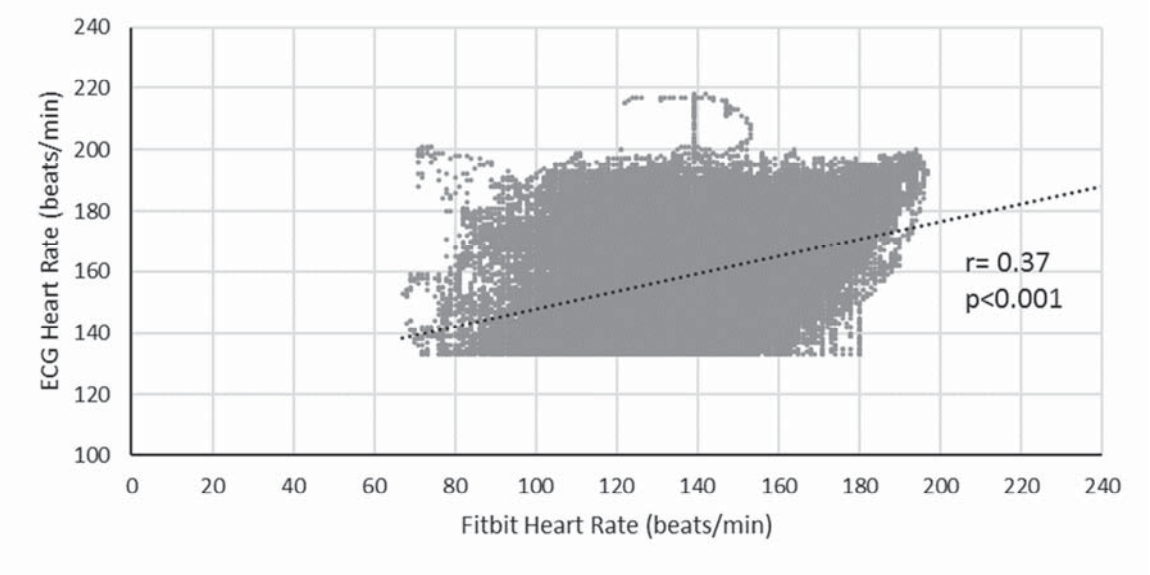

Figure 15. Relationship between time-synced ECG and PurePulse Tracker heart rate during high ECG-measured heart rate range (>132 bpm)

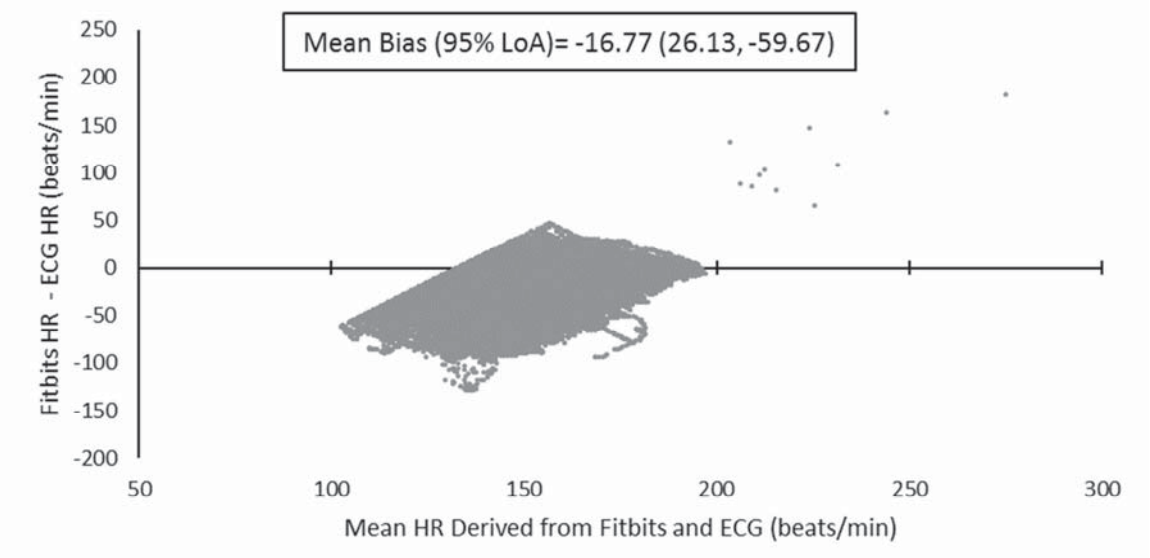

Figure 16. Bland-Altman plot indicating mean difference in heart rate detection between the PurePulse Trackers and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

E.3.3. HR Data below mean ECG HR (<133 bpm): Time synced heart rate data below the mean ECG HR (<133 bpm; n=127,947pairs) were analyzed. During conditions in which the ECG HR (true HR) was below 133 bpm, there was a significant (p<0.001) and moderately strong positive correlation between ECG and Surge (r=0.79) (Table 3, Figure 17). In addition, the mean HR from

the PurePulse Trackers (103.91 ± 20.45 bpm) significantly (p<0.001) differed from the mean ECG HR (104 ± 17.96 bpm) (discrepancy of 8.28 ± 9.02% or 8.51± 9.02 bpm) (Table 3). The PurePulse Trackers exhibited a mean bias of -0.79 ± 12.75 bpm (95% LoA 24.20, -25.79) compared to ECG during lower (<133 bpm) ECG/true heart rate conditions (e.g. low intensity exercise) (Table 3, Figure 18).

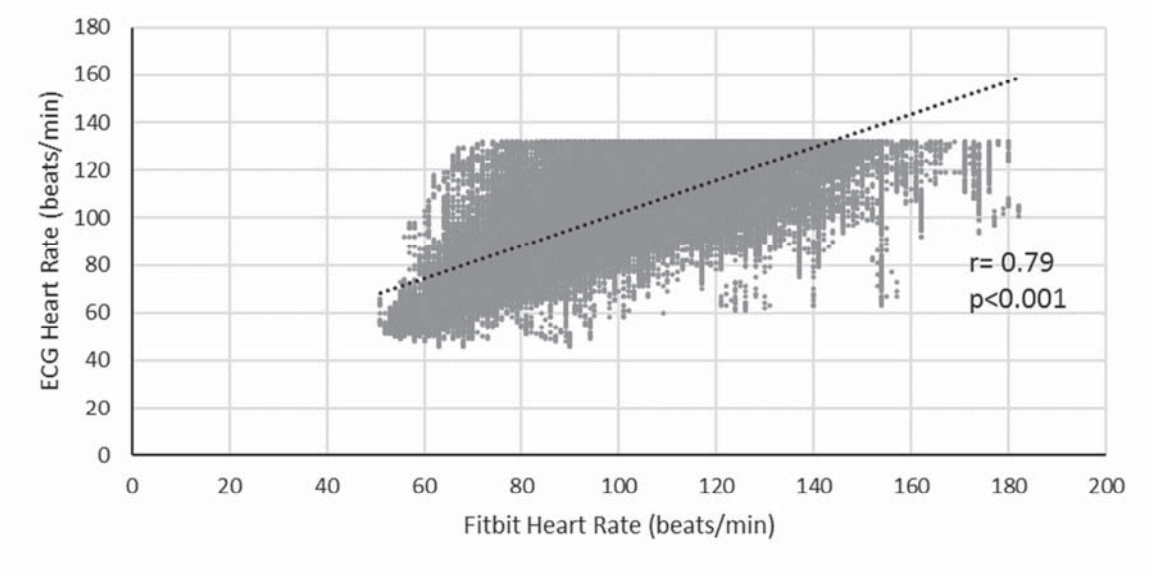

Figure 17. Relationship between time-synced ECG and PurePulse Tracker heart rate during high ECG-measured heart rate range (<133 bpm)

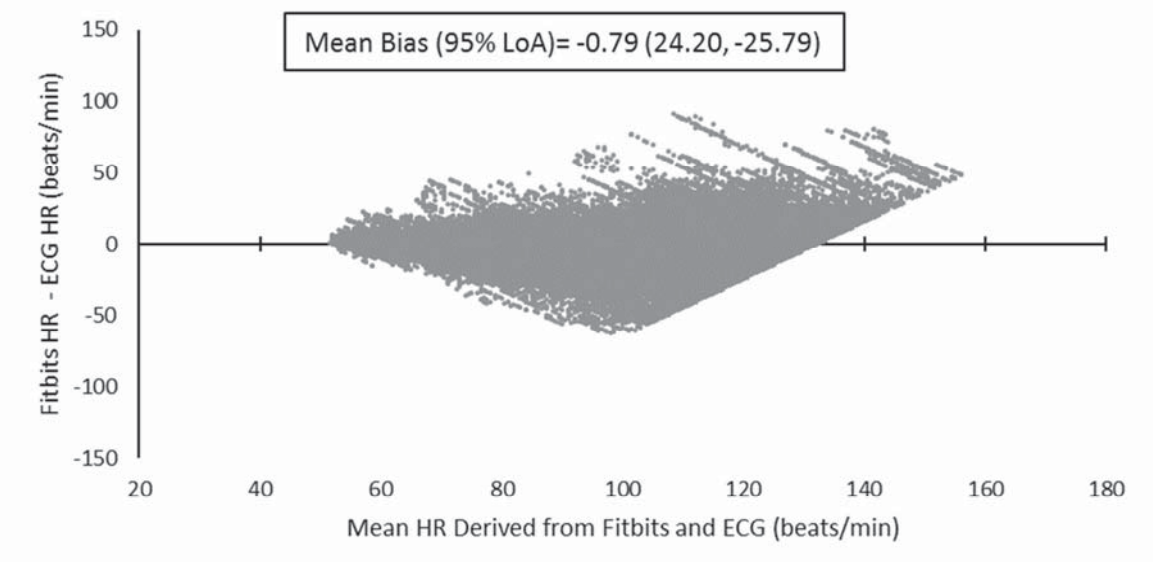

Figure 18. Bland-Altman plot indicating mean difference in heart rate detection between the PurePulse Trackers and ECG criterion measure. Mean bias and limits of agreement (95% LoA) are shown.

Parameter	Aggregate Data (n=259,478)	Data above ECG HR >132bpm (n=131,531)	Data below ECG HR <133bpm (n=127,947)
PurePulse Trackers Mean HR (bpm ± SD)	124.13 ± 28.97*	143.80 ± 21.56*	103.91 ± 20.45*
ECG Mean HR (bpm ± SD)	133.02 ± 32.88	160.57 ± 16.74	104.70 ± 17.96
Mean Absolute Difference (bpm ± SD)	13.94 ± 12.08	19.22 ± 14.04	8.51 ± 9.02
Mean Percent Difference (% ± SD)	10.74 ± 12.08	13.14 ± 14.04	8.28 ± 9.02
Correlation (r)	0.88^	0.37^	0.79^
Mean Bias (bpm ± SD)	-8.89 ± 19.67	-16.77 ± 21.89	-0.79 ± 12.75
95% Limits of Agreement (Upper, Lower)	29.66, -47.44	26.13, -59.67	24.20, -25.79
Standard Error of the Estimate (SEE)	17.19	20.04	12.62

^ Significant ($p<0.001$) correlation
* Significantly ($p<0.001$) different than ECG

Table 3. Summary of heart rate comparison data between PurePulse Trackers and ECG.

E.4. Manually Recorded Data

As a secondary method of data acquisition, heart rates were manually recorded from the device/watch interface and mobile monitors linked to the devices, including ECG, each minute of testing. Tables 4-6 below include the results for Charge HR, Surge and combined (i.e. PurePulse Trackers), respectively, with and without null data (i.e. "--" readings) included in the analysis. Where included, the null readings were interpreted as a heart rate of 0 bpm.

The results for the Charge HR are reflected in the chart below.

Parameter	Aggregate Data w/ Null Data (n=2,795)	Aggregate Data w/o Null Data (n=2,711)	Data above ECG HR >132bpm w/ Null Data	Data above ECG HR >132bpm w/o Null Data	Data below ECG HR <133bpm w/ Null Data	Data below ECG HR <133bpm w/o Null Data
Charge HR Mean HR (bpm ± SD)	123.24 ± 36.75*	127.24 ± 30.11*	145.50 ± 31.35*	149.75 ± 19.37*	100.57 ± 26.58*	103.87 ± 19.66
ECG Mean HR (bpm ± SD)	133.42 ± 33.70	133.32 ± 33.58	162.00 ± 17.32	161.74 ± 17.19	104.33 ± 17.55	104.30 ± 17.61
Mean Absolute Difference (bpm ± SD)	14.01 ± 34.26	10.21 ± 10.02	18.24 ± 33.60	13.79 ± 11.30	9.70 ± 34.91	6.55 ± 8.32
Mean Percent Difference (% ± SD)	13.62 ± 34.26	7.85 ± 10.02	14.54 ± 33.60	9.13 ± 11.30	12.69 ± 34.91	6.54 ± 8.32
Correlation (r)	0.69^	0.88^	0.25^	0.53^	0.61^	0.86^
Mean Bias (bpm ± SD)	-10.18 ± 27.85	-6.27 ± 15.70	-16.49 ± 31.88	-11.99 ± 17.87	-3.76 ± 21.18	-0.42 ± 10.22
95% Limits of Agreement (Upper, Lower)	44.39, -64.76	24.50, -37.03	46.00, -78.98	23.04, -47.01	37.76, -45.28	19.61, -20.46
Standard Error of the Estimate (SEE)	24.37	15.69	16.80	14.61	13.96	9.13

^ Significant ($p<0.001$) correlation
* Significantly ($p<0.05$) different than ECG

Table 4. Summary of heart rate comparison manually recorded data between Fitbit Charge and ECG.

The results for the Surge are reflected in the chart below.

Parameter	Aggregate Data w/ Null Data (n=2,795)	Aggregate Data w/o Null Data (n=2,711)	Data above ECG HR >132bpm w/ Null Data	Data above ECG HR >132bpm w/o Null Data	Data below ECG HR <133bpm w/ Null Data	Data below ECG HR <133bpm w/o Null Data
Surge Mean HR (bpm ± SD)	117.24 ± 36.13*	121.81 ± 28.26*	133.17 ± 33.67*	141.50 ± 22.20*	101.01 ± 22.59*	102.64 ± 18.74
ECG Mean HR (bpm ± SD)	133.42 ± 33.70	132.63 ± 33.71	162.00 ± 17.32	161.90 ± 17.21	104.33 ± 17.55	104.13 ±17.54
Mean Absolute Difference (bpm ± SD)	19.63 ± 38.18	14.40 ± 13.13	30.21 ± 46.26	21.88 ± 16.03	8.86 ± 25.30	7.12 ± 7.68
Mean Percent Difference (% ± SD)	18.09 ± 38.18	10.99 ± 13.13	25.88 ± 46.26	14.99 ± 16.03	10.16 ± 25.30	7.10 ± 7.68
Correlation (r)	0.52^	0.79^	0.13^	0.28^	0.63^	0.84^
Mean Bias (bpm ± SD)	-16.19 ± 34.30	-10.82 ± 20.70	-28.82 ± 41.23	-20.40 ± 24.03	-3.32 ± 17.80	-1.49 ± 10.34
95% Limits of Agreement (Upper, Lower)	51.04, --83.42	29.75, -51.38	51.98, -109.63	26.70, -67.50	31.56, -38.20	18.78, -21.75
Standard Error of the Estimate (SEE)	28.80	20.64	17.19	16.54	13.60	9.53

^ Significant ($p<0.001$) correlation
* Significantly ($p<0.05$) different than ECG

Table 5. Summary of heart rate comparison manually recorded data between Fitbit Surge and ECG.

The results for the PurePulse Trackers combined are reflected in the chart below.

Parameter	Aggregate Data w/ Null Data (n=5,590)	Aggregate Data w/o Null Data (n=5,401)	Data above ECG HR >132bpm w/ Null Data	Data above ECG HR >132bpm w/o Null Data	Data below ECG HR <133bpm w/ Null Data	Data below ECG HR <133bpm w/o Null Data
PurePulse Mean HR (bpm ± SD)	120.24 ± 36.56*	124.45 ± 29.32*	139.34 ± 36.28*	145.69 ± 21.21*	100.79 ± 24.66*	103.25 ± 19.20
ECG Mean HR (bpm ± SD)	133.42 ± 33.69	132.98 ± 33.65	162.00 ± 17.32	161.82 ± 17.20	104.33 ± 17.55	104.21 ± 17.57
Mean Absolute Difference (bpm ± SD)	16.82 ± 36.34	12.29 ± 11.77	24.23 ± 40.81	17.77 ± 14.14	9.28 ± 30.51	6.84 ± 8.01
Mean Percent Difference (% ± SD)	15.86 ± 36.34	9.41 ± 11.77	20.21 ± 40.81	12.01 ± 14.14	11.42 ± 30.51	6.82 ± 8.01
Correlation (r)	0.60^	0.83^	0.18^	0.39^	0.62^	0.85^
Mean Bias (bpm ± SD)	-13.18 ± 31.38	-8.53 ± 18.50	-22.66 ± 37.36	-16.13 ± 21.54	-3.54 ± 19.56	-0.96 ± 10.29
95% Limits of Agreement (Upper, Lower)	48.32, -74.69	27.72, -44.79	50.56, -95.88	26.09, -58.34	34.80, -41.88	19.21, -21.13
Standard Error of the Estimate (SEE)	26.87	18.46	17.05	15.87	13.82	9.34

^ Significant ($p<0.001$) correlation
* Significantly ($p<0.05$) different than ECG

E.5. Charge HR vs. Surge

E.5.1. Aggregate Data: When examining all time-synced Surge and Charge HR heart rate data in aggregate (n= 113,994 pairs), there was a significant ($p<0.001$) and moderately strong positive correlation between the two trackers ($r=0.85$) (Table 4, Figure 19). The mean HR from the Charge HR (126.90 ± 29.60 bpm) significantly ($p<0.001$) differed from Surge (121.62 ± 27.50 bpm) (discrepancy of 7.93 ± 10.09% or 10.00 ± 10.09 bpm) (Table 4).

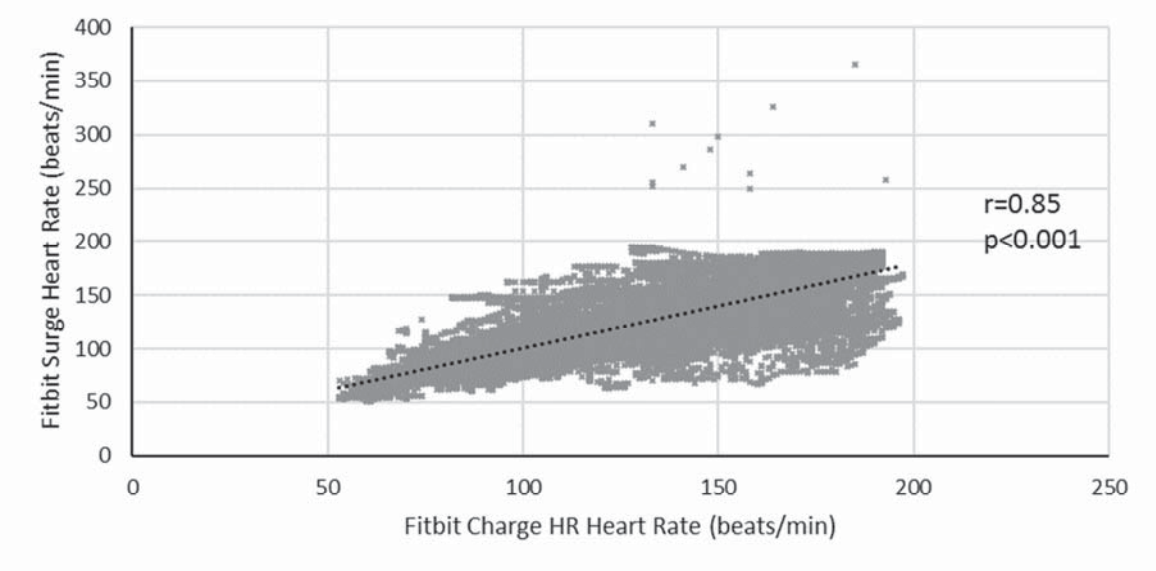

Figure 19. Relationship between time-synced Fitbit Charge HR and Fitbit Surge heart rate.

E.5.2. HR Data above mean combined HR (>124 bpm): When examining all time-synced Surge and Charge HR heart rate data above the combined average of 124 bpm (average of heart rate values across all PurePulse Tracker heart rate data) (n= 60,292 pairs), there was a significant ($p<0.001$) and weak correlation between the two trackers ($r=0.46$) (Table 4, Figure 20). The mean HR from the Charge HR (149.48 ± 17.11 bpm) significantly ($p<0.001$) differed from Surge (141.79 ± 18.27 bpm) (discrepancy of 8.66 ± 10.89% or 12.47 ± 10.89 bpm) (Table 4).

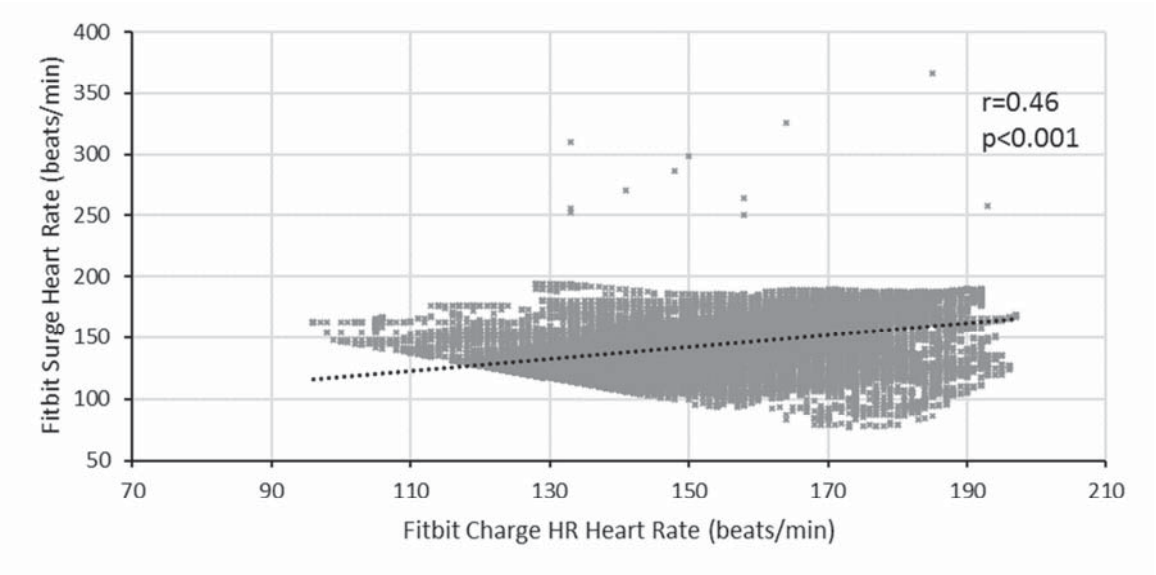

Figure 20. Relationship between time-synced Fitbit Charge HR and Fitbit Surge heart rate when data separated above average combined heart rate (>124 bpm)

E.5.3. HR Data below mean combined HR (<125 bpm): When examining all time-synced Surge and Charge HR heart rate at and below the combined average of 124 bpm (n= 53,702 pairs), there was a significant ($p<0.001$) and moderate correlation between the two trackers ($r=0.76$) (Table 4, Figure 21). The mean HR from the Charge HR (101.55 ± 17.76 bpm) significantly ($p<0.001$) differed from Surge (98.98 ± 16.17 bpm) (discrepancy of 7.11 ± 9.04% or 7.23 ± 9.04 bpm) (Table 4).

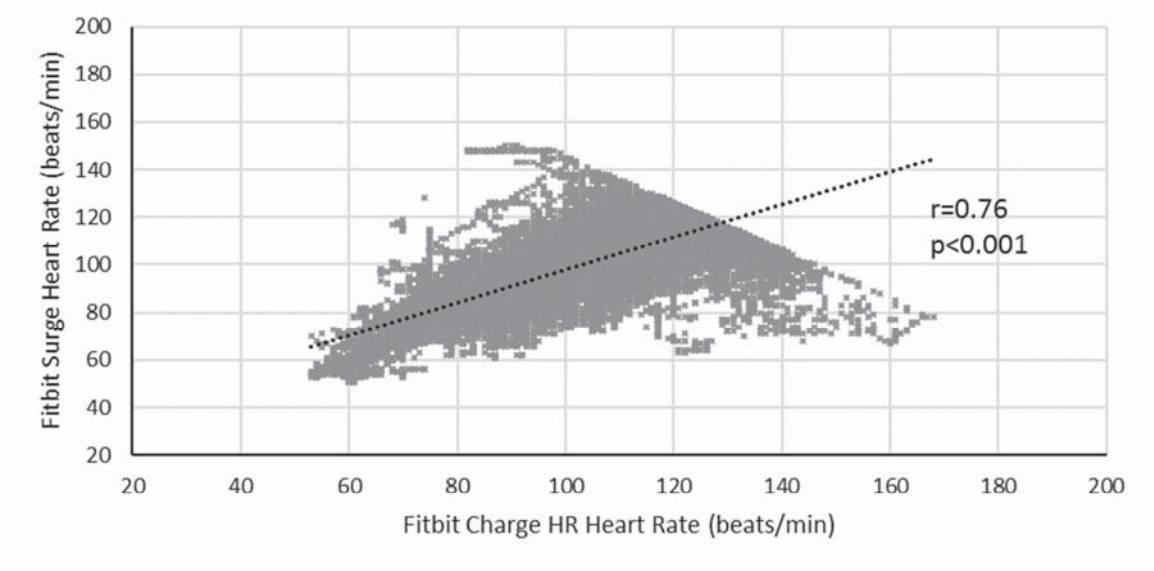

Figure 21. Relationship between time-synced Fitbit Charge HR and Fitbit Surge heart rate when data separated below average combined heart rate (<125 bpm)

Parameter	Aggregate Data (n=113,994)	Data above combined avg. HR >124bpm (n=60,292)	Data below combined avg. HR <125bpm (n=53,702)
Charge HR Mean HR (bpm ± SD)	126.90 ± 29.60*	149.48 ± 17.11*	101.55 ± 17.76*
Surge HR (bpm ± SD)	121.62 ± 27.50	141.79 ± 18.27	98.98 ± 16.17
Mean Absolute Difference (bpm ± SD)	10.00 ± 10.09	12.47 ± 10.89	7.23 ± 9.04
Mean Percent Difference (% ± SD)	7.93 ± 10.09	8.66 ± 10.89	7.11 ± 9.04
Correlation (r)	0.85^	0.46^	0.76^

^ Significant (p<0.001) correlation
* Significantly (p<0.001) different than Surge HR

Table 6. Summary of heart rate comparison data between Charge HR and Surge.

F. INTERPRETATION OF RESULTS

When examining the data in aggregate (n=127,215), the Charge HR failed to meet previously established validity criteria for heart rate monitors (SEE ≤ 5 bpm, r ≥ 0.90, and mean bias < 3 bpm). Although we observed a moderately strong correlation (r=0.85) between the Charge HR and ECG, there was a statistically significant (p<0.001) 9.5% (12.2 bpm) discrepancy between the Charge HR and ECG with the Charge HR exhibiting an average bias of -6.1 bpm (SEE= 15.9). This was a non-systematic bias based on the relatively wide limits of agreement (95% LoA 28.63, -40.81) (i.e. very sporadic difference scores), and therefore, both methods may not be used interchangeably for the measurement of heart rate. The LoA also suggests that the Charge HR trends towards an underestimation of heart rate. This inaccuracy is much more prominent when assessing validation among data pairs above the mean ECG heart rate (~132 bpm) compared to below. During these "high" heart rate conditions (e.g. assumingly moderate to high intensity exercise), the Charge HR demonstrated a weak relationship and extremely poor agreement with ECG (r= 0.48, mean difference= 10.4% or 15.5 bpm, SEE=17.6, mean bias= -12.5 bpm, 95% LoA 24.9, -49.9). However, it must be noted, that during lower ECG-based heart rate

conditions (e.g. rest to low intensity exercise), only one out of the three established validity criteria were met (r= 0.78, mean bias= 0.36 bpm, SEE=13.35). Moreover, despite a relatively small mean bias, the wide limits of agreement (95% LoA 26.7, -26.0) indicate that even during rest to relatively light physical activity, the Charge HR may not be utilized interchangeably with ECG for the measurement of heart rate.

The Surge presented with weaker correlation (r=0.77) and less agreement (mean bias= -11.6 bpm, 95% LoA 29.6, -52.8, SEE= 17.8) to ECG than the Charge HR when examining the entire data set (n=132,263). Additionally, the 12.0% (15.6 bpm) discrepancy between Surge and ECG was statistically significant ($p<0.001$). The Bland-Altman Plot for the aggregate data set reflect not only large underestimation by the Surge, but wide limits of agreement. Thus, the Surge may not be considered interchangeable with ECG for the measurement of heart rate. As with Charge HR, we observed an increased level of inaccuracy with the Surge during physical activities eliciting higher ECG heart rates (i.e. >132bpm). The extremely weak correlation (r= 0.26) together with the large mean bias (= -20.8 bpm), and high SEE (=21.14) strongly suggest the Surge to be highly inaccurate during elevated physical activity. The Surge appeared to perform better during conditions corresponding to lower ECG heart rates based on a marginal average bias (= -1.9 bpm). However, other validity criteria were not met and thus may not be considered valid even during rest to light physical activity.

When examining both PurePulse Trackers in combination, the correlation (r-value), mean bias, and SEE also failed to meet validation criteria for heart rate monitors. As with each tracker analyzed separately, the combined data demonstrate compromised accuracy especially during higher intensities of exercise (>132 bpm).

The manually recorded data, as presented in Tables 4-6, adds further support to the results derived from the analysis of data acquired through the primary method of acquisition. That is, the results of manually recorded data strongly corroborate the results of the data obtained through the primary acquisition method. The manual approach to data collection, although not as sophisticated as the primary method, adds practical value to the overall findings given that consumers acquire heart rate data through similar methods (i.e. reading the value provided in real time through the watch interface). On the basis of these corroborating results, it is with strong scientific reasoning that it can be concluded that the Fitbit Charge HR and Surge fail to provide even reasonably accurate and reliable heart rate measurements.

Furthermore, a comprehensive comparison between both PursePulse Trackers (Section E.5) demonstrates considerable inconsistencies between the devices. This is surprising and concerning. The two Fitbit models purportedly incorporate the same PurePulse™ sensor technology for heart rate detection. And yet there were statistically significant discrepancies and a very imperfect correlation between the two models that were simultaneously recording the same heartbeat. It is reasonably assumed that both devices would yield similar heart rate values per given time point producing a near-perfect to perfect correlation (e.g. r= 1.00). However, the results from our analysis indicated only a moderately-strong correlation (r=0.85) which, in fact, weakened with increasing physical effort (r=0.46). This discrepancy in heart rate detection between the two devices with the same optical sensor technology further substantiates the inaccuracies reflected by the validation data and further confirms the failure of the PurePulse Trackers to accurately and consistently record heart rate data.

G. CONCLUDING STATEMENT

With strong scientific reasoning, the PurePulse™ technology embedded in the Fitbit optical sensors does not accurately record heart rate, and is particularly unreliable during moderate to high intensity exercise. The relatively weak correlations along with high biases and errors (i.e. poor agreement to ECG) reveal the significant limitations of PurePulse™ for biometric monitoring during exercise; although moderately better performance was observed during resting conditions. The devices are also inconsistent, as can be reasonably inferred from the notable discrepancies between Fitbit devices simultaneously measuring the heart rate. Moreover, disruptions to continuous heart rate detection in both Fitbit devices were quite common during testing periods based on manually recorded data. Although the factors underlying the observed inaccuracies extend beyond the scope of this study, it may be speculated that the current algorithms for heart rate estimation lack proper sophistication and sufficient data support

to control for the multitude of confounding factors associated with PPG-based heart rate detection. Overall, the results of this investigation demonstrate that the PurePulse™ technology integrated in Fitbit's heart rate monitoring devices is not a valid method for heart rate measurement, and cannot be used to provide a meaningful estimate of a user's heart rate.

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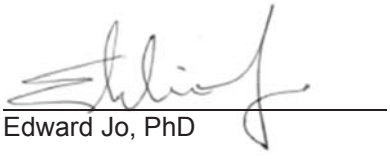
Respectfully Submitted,



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PUBLICATIONS AND CURRENT PROJECTS

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6. Wong M, **Jo E**, Cain A, Kim J-S. A single-center evaluation of a proprietary hypocaloric treatment for morbid obesity. 2015 ACSM Southwest Chapter Annual Meeting, Costa Mesa, CA, October 16, 2015

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9. Wong M and **Jo E**. A single-center evaluation of a proprietary hypocaloric treatment for morbid obesity. 2015 CPP College of Science Research Symposium, May 29, 2015

10. **Jo E**, Ormsbee MJ, Cain A, Snyder K, Elam M, Yeh M-C, Worts P, Khamoui AV, Kim D-H, Prado CM, Smith D, Brown AF, and Kim J-S. The clinical application of periodized resistance training during a 12-week hypocaloric treatment for obesity. 2015 ACSM National Conference, San Diego, CA, May 29, 2015

11. Khamoui AV, Kim D-H, Yeh M-C, Park B-P, Oh S-L, Elam ML, Worts PR, **Jo E**, Myers CM, Arjmandi BH, Salazar G, McCarthy DO, and Kim J-S. Aerobic and resistance training effects on skeletal muscle plasticity in colon-26 tumor-bearing mice. 2015 ACSM National Conference, San Diego, CA, May 29, 2015

12. Gavin JM, Kwoh N, **Jo E**, and Liang MTC. Low body mass index affects bone health in young women. 2015 ACSM National Conference, San Diego, CA May 29, 2015, May 29, 2015

13. Zourdos MC, Dolan C, Quiles JM, Klemp A, Blanco R, Krahwinkel AJ, Goldsmith JA, **Jo E**, Loenneke JP, and Whitehurst M. Efficacy of daily 1RM squat training in well-trained lifters: Three case studies. 2015 ACSM National Conference, San Diego, CA, May 29, 2015

14. Yeh M-C, **Jo E**, Worts P, Cain A, Elam M, Khamoui AV, Kim D-H, Ormsbee MJ, Prado CM, Smith D, Snyder K, and Kim J-S. The clinical application of periodized resistance training during a 12-week hypocaloric treatment for obesity. 2015 ACSM Southeast Chapter Annual Meeting, Jacksonville, FL, February 12-14, 2015.

15. Dolan C, Quiles JM, Klemp A, Schau KA, Esgro B, **Jo E**, and Zourdos MC. Evaluating squat attempt velocities of collegiate and open powerlifters as a marker of performance and indicator of success during competition. NSCA National Conference, Las Vegas, NV, July 9-12, 2014.

16. Klemp A, Dolan C, Quiles JM, Schau KA, Esgro B, **Jo E**, and Zourdos MC. The usefulness of average velocity of opening deadlift attempts in open and collegiate powerlifters during competition as a predictor of performance. NSCA National Conference, Las Vegas, NV, July 9-12, 2014.

17. **Jo E**, Cain A, Prado CM, Ormsbee MJ, Arjmandi B, Snyder K, Smith D, Khamoui AV, Yeh M-C, Kim D-H, Park B-S, Oh S-L, and Kim J-S. A single-center evaluation of a proprietary hypocaloric treatment for morbid obesity. Annual Meeting, ACSM, Orlando, FL, May 27-31, 2014.

18. Oh S-L, Lee S-R, Khamoui AV, **Jo E**, Park B-S, Ormsbee MJ, Kim D-H, Yeh M-C, and Kim J-S. Effects of CLA/n-3 and resistance training on muscle quality in middle-aged mice during high-fat diet. Annual Meeting, ACSM, Orlando, FL, May 27-31, 2014.

19. Zourdos MC, **Jo E**, Khamoui AV, Park B-S, Lee S-R, Panton LB, Ormsbee MJ, Thomas D, Ward E, Contreras RJ, and Kim J-S. Novel daily undulating periodization model produces greater performance gains than a traditional configuration in powerlifters. Annual Meeting, ACSM, Indianapolis, IN, May 30, 2013.

20. Park B-S, Henning PC, Khamoui AV, **Jo E**, Lee S-R, Zourdos MC, Kim D-H, Yeh M-C, and Kim J-S. HMB attenuates a loss of myofiber cross-sectional area during prolonged exercise with calorie restriction by Enhancing Regenerative Capacity. Experimental Biology, Boston, MA, April 20-24, 2013.

21. Lee S-R, Jo E, Khamoui AV, Park B-S, Zourdos MC, Grant SC, and Kim J-S. Fatty Acid and Resistance Exercise Administration Improve Muscle Wasting by Impaired Myogenic Capacity in High Fat Diet-Fed Mice. Experimental Biology, Boston, MA, April 20-24, 2013.

22. Zourdos MC, **Jo E**, Khamoui AV, Park B-P, Lee S-R, Panton LB, Contreras RC, Ormsbee MJ, Wilson JM, and Kim J-S. Time course of hormonal responses with two different models of daily undulating periodization in trained powerlifters. Annual Meeting, SEACSM, Greenville, SC, February 14-16, 2013.

23. **Jo E,** Zourdos MC, Wilson JM, Nosaka K, Lee S-R, Naimo M, Henning PC, Park Y-M, Khamoui AV, Park B-P, Panton LB, and Kim J-S. Varying muscle-specific exercise between consecutive training sessions does not diminish the repeated bout effect. Annual Meeting, ACSM, San Francisco, CA, May 29-June 2, 2012.

24. Zourdos MC, Khamoui AV, **Jo E**, Park B-P, Lee S-R, Panton LB, Contreras RC, Ormsbee MJ, Wilson JM, and Kim J-S. Changes in maximal strength with two different models of daily undulating periodization in trained powerlifters. Annual Meeting, ACSM, San Francisco, CA, May 29-June 2, 2012.

25. Lee S-R, Khamoui AV, **Jo E**, Park B-P, Zourdos MC, Bakhshalian N, Grant SC, Arjmandi BH, Ormsbee MJ, Kim J-S. Anti-catabolic Effects of CLA/n-3 In Resting And Loaded Muscles of High Fat Diet-fed Mice. Annual Meeting, ACSM, San Francisco, CA, May 29-June 2, 2012.

26. Kim J-S, Lee S-R, Grant SC, **Jo E**, Khamoui AV, , Park B-P, Zourdos MC, Hooshmand S, Ormsbee MJ, Arjmandi BH. Fatty Acid Intake and Exercise Improve Body Composition and Functionality in High Fat Diet-Fed Mice. Annual Meeting, ACSM, San Francisco, CA, May 29-June 2, 2012.

27. Wilson JM, Marin PJ, Duncan N, Loenneke JP, **Jo E**, Zourdos MC, Brown LE. Post Activation Potentiation: A Meta-Analysis Examining The Effects Of Volume, Rest Period Length, And Conditioning Mode On Power. Annual Meeting, ACSM, San Francisco, CA, May 29-June 2, 2012.

28. Park B-S, Henning PC, Lee S-R, Wilson JM, Park Y-M, **Jo E**, Khamoui AV, Zourdos MC, and Kim J-S. β -hydroxy-β-methylbutyrate (HMB) improves myogenesis and maintains strength in male mice during a 6-wk catabolic condition. Experimental Biology, Washington D.C, April 8-13, 2011.

29. Lee S-R, Wilson JM, Henning PC, Ugrinowitsch C, Park Y-M, Zourdos MC, Park B-S, Khamoui AV, **Jo E**, Grant SC, Panton LB, and Kim J-S. B-hydroxy-β-methylbutyrate (HMB) improves relative grip strength and sensorimotor function in middle aged and old rats. Annual Meeting, ACSM, Baltimore, MD, June 2-5, 2010.

30. Park Y-M, Lee S-R, Wilson JM, Henning PC, Bakhshalian N, Ugrinowitsch C, Zourdos MC, Park B-S, **Jo E**, Khamoui AV, and Kim J-S. Influence of β-hydroxy-β-methylbutyrate (HMB) on body composition and neuromuscular function in old rats during resistance training. Annual Meeting, ACSM, Baltimore, MD, June 2-5, 2010.

31. **Jo E**, Martinez M, Brown LE, Coburn JW, Biagini M, Gochioco M, Judelson DA. Effects of caffeine on resistance exercise performance, mood, heart rate, and rating of perceived exertion. Annual Meeting ACSM, Baltimore, MD, June 2-5 2010.

32. Lee SR, Park YM, Wilson JM, Henning PC, Zourdos MC, Bakhshalian N, Ugrinowitsch C, Park BS, Khamoui A, **Jo E**, Kim JS. Effects of β -hydroxy-β-methylbutyrate (HMB) on body composition in old Sprague-Dawley female rats during 10-week resistance training Lee. Annual Meeting, SEACSM, Greenville, SC, February 11-13, 2010.

33. **Jo E**, Martinez M, Brown LE, Coburn JW, Biagini M, Gochioco M, Judelson DA. Effects of caffeine on resistance exercise performance, mood, heart rate, and rating of perceived exertion. Annual Meeting, SEACSM, Greenville, SC, February 11-13, 2010.

34. Khamoui AV, Brown LE, Tran TT, Uribe BP, Nguyen D, Gochioco MK, Schick EE, **Jo E**, Coburn JW, Noffal GJ. Comparison of methods to calculate vertical jump displacement. Annual Meeting, SEACSM, Greenville, SC, February 11-13, 2010.

35. Khamoui AV, Nguyen D, Uribe BP, Tran T, **Jo E,** Brown LE, Coburn JW, Judelson DA, Noffal GJ. Relationship between Dynamic Kinematics and Isometric Force-Time Characteristics. NSCA National Conference, Las Vegas, NV, July 8-11, 2009.

36. Dabbs NC, Khamoui AV, Nguyen D, Uribe BP, Tran T, **Jo E,** Brown LE, Coburn JW, Judelson DA, Noffal GJ. Difference in Vertical Jump Performance by Force Production. NSCA National Conference, Las Vegas, NV, July 8-11, 2009.

37. Tran T, Faulkinbury K, Stieg J, Khamoui AV, Uribe BP, Dabbs NC, **Jo E,** Brown LE FNSCA, Coburn JW FNSCA, and Judelson DA. Effect of 10 Repetitions of Box Jumps on Peak Ground Reaction Force. NSCA National Conference, Las Vegas, NV, July 8-11, 2009.

38. **Jo E**, Judelson DA, Brown LE, Coburn JW, Dabbs N, Uribe BP. Influence of Rest Duration Following a Potentiating Stimulus on Muscular Power in Recreationally Trained Individuals. Annual Meeting, ACSM, Seattle, WA, May 27-30, 2009.

CONTRACTS, GRANTS, AND DONATIONS

1. **Jo E** (PI) and Dolezal BA. Validation of Fitbit Surge and Charge HR Fitness Trackers. Funding Source: Lieff, Carbraser, Heimann, and Bernstein. Amount: $10,100 (Funded 1/29/16)

2. **Jo E** (PI). The effects of a two-week nitrate supplementation loading phase on time trial performance and muscle oxygenation using near infrared spectroscopy. Funding Source: Shaklee Corporation. Amount: $7,000 in-kind value of supplies (Funded 9/25/15)

3. **Jo E** (PI) and Dolezal BA. Validation of the Basis Peak™ Smart Watch. Funding Source: Basis, an Intel Company. Amount: $6,000 in-kind value of supplies (Funded 9/10/15)

4. **Jo E** (PI). Acquisition of Ultrasonic Imaging System. Funding Source: 2015-2016 SPICE Classroom Modernization Program- Cal Poly Pomona. Amount: $15,396.97 (Funded 6/2/15)

5. **Jo E** (PI). The effects of intersession recovery supplementation of MusclePharm GAINZ™ on the metabolic, morphometric, and performance adaptations to an 8-week high-volume resistance training program. Funding Source: International Society of Sports Nutrition and MusclePharm Corp. Amount: $10,000+$2,400 in-kind value of supplies= $12,400 (Funded 2/25/15)

6. **Jo E** (PI). A single-blinded randomized, controlled study of the effects of stretch refle air on flexibility and posture: a research proposal. Funding Source: NCC Co. Ltd. Amount: $120,537 (Funded)

7. Liang M, **Jo E** (Co-PI), Spalding T, and Moustafa M. Effects of whole-body vibration training on bone density and bending strength in premenopausal women. Funding Source: NIH-SCORE S3. Amount: $150,000 (not funded)

8. **Jo E** (PI). Exercise and Nutrition Research for Obesity Treatment. Funding Source: Kellogg FuTURE Program, Cal Poly Pomona Office of Undergraduate Research. Amount: $2,000 (Funded 2/4/2015)

9. **Jo E** (PI). Human Health and Performance Research. Funding Source: 2015 Faculty Center for Professional Development, Cal Poly Pomona. Amount: $1,000 (Funded 1/15/2015)

10. **Jo E** (PI). Cal Poly Human Performance and Nutrition Research. Funding Source: Dymatize Nutrition. Amount: $1,272.23 in-kind value of supplies (Funded 12/2/14)

11. Liang M and **Jo E** (Co-PI)**.** Low body mass index affects bone health in young females. Funding Source: Research, Scholarly and Creative Activities (RSCA) Grant Program, Cal Poly Pomona. Amount: $5,000 (Funded 10/13/15)

12. **Jo E** (PI). Effects of Thermogenic Supplementation on Muscular Performance during a Bout of High Intensity Interval Training and Pre-, Mid- and Post- Exercise Metabolic Rate in Overweight, College-aged Males and Females. Funding Source: 2014 Faculty Center for Professional Development, Cal Poly Pomona. Amount: $1,000 (Funded)

13. **Jo E** (PI). The clinical application of periodized resistance training and HMB free acid supplementation during a 12-week hypocaloric treatment for obesity: A multicenter clinical trial. Metabolic Technologies Inc. (in review)

14. **Jo E** (PI; Primary Grant Writer) and Ormsbee MJ. Periodized resistance training and whey protein intake during weight-loss treatment. Funding Agency: National Strength and Conditioning Association Foundation. Amount: $10,000 (Funded)

15. Kim JS (PI), Cain AF, Ormsbee MJ, Prado C, Snyder K, Smith D, and **Jo E** (Co-PI; Primary Grant Writer). The independent and combined effects of Programmed resistance training and whey protein supplementation on body composition, resting metabolic rate, neuromuscular function, and Biochemical Regulators of lean tissue Morphology in clinically obese subjects undergoing weight-loss treatment. Funding Agency: Nestlé HealthCare Nutrition. Amount: ~$120,000 in product support (scored; not funded)

16. Kim JS (PI), Arjmandi BH, Grant SC, and **Jo E** (Primary Grant Writer). Efficacy of Anti-Inflammatory Fatty Acids in Attenuating Inflammation-Mediated Musculoskeletal Impairments during Lifelong High Fat Diet. Funding Agency: USDA. Amount: $500,000 (not funded)

17. Kim JS (PI), Arjmandi BH, Grant SC, Levenson CW, and **Jo E** (Primary Grant Writer). Reversing Obesity-Accelerated Aging: Mechanisms of Diet and Exercise Amount: Funding Agency: NIH-R01. Amount: $1,702,917 (scored; not funded)

18. Kim JS (PI), Arjmandi BH, Grant SC, and **Jo E** (Primary Grant Writer). Efficacy of Anti-Inflammatory Fatty Acids in Attenuating Inflammation-Mediated Musculoskeletal Impairments during Lifelong High Fat Diet. Funding Agency: USDA. Amount: $500,000 (scored; not funded)

CERTIFICATIONS / LICENSES

International Society of Sports Nutrition

- Certified Sports Nutritionist (CISSN), 6/17/14 - Current

California Department of Public Health, Radiologic Health Branch
- X-Ray Technician Bone Densitometry Permit (DXA) (#RHP00098002), 8/31/14 - Current

The Foundation of Osteoporosis Research and Education
- Limited Permit X-Ray Technician, 3/2/14 - Current

National Strength and Conditioning Association
- Certified Strength and Conditioning Specialist (CSCS), 11/8/07 - Current
- Certified Personal Trainer (CPT), 11/13/04 – Current

American Heart Association
- Adult and Child CPR and AED, Current

PROFESSIONAL MEMBERSHIPS

International Society of Sports Nutrition, 1/14 - Current
American Physiological Society, 6/11 - Current
American College of Sports Medicine, 6/15/10 - Current
Southeast Chapter of American College of Sports Medicine, 2/10 - Current
National Strength and Conditioning Association, 11/13/04 – Current

PROFESSIONAL AND ACADEMIC SERVICES

One More Round Documentary Advisory Board
Advisory Board Member, Fall 2014-Current

Editorial Review Panel
NSCA Coach Publication, Summer 2014-Current

Kellogg Honors College Application Reviewer
California State Polytechnic University, Pomona, Winter 2014

Student Health Advisory Committee
California State Polytechnic University, Pomona, Winter 2014-Current

International Society of Sports Nutrition (ISSN) West Coast Representative
International Society of Sports Nutrition, Spring 2014-Current

Invited Peer Reviewer
Applied Physiology, Metabolism and Nutrition
Sports Medicine
NSCA Performance Training Journal
Journal of Strength and Conditioning Research
NSCA Coach

College of Human Sciences Graduate Show Case 2012
Florida State University
Graduate Student Panel, 10/18/2012

College of Human Sciences Dissertation Award Program
Florida State University
Invited Reviewer, 10/2012

Center of Advancing Exercise and Nutrition Research on Aging
Florida State University
Graduate Student Assistant
Founding Student Member, 1/11/2012 - Current

Optimizing Performance: Training and Nutritional Adaptations Symposium
Florida State University and Florida A&M University
Organizer, 10/14/2012

LABORATORY SKILLS AND ANALYTICAL TECHNIQUES

Analysis of human health and performance

- Maximal VO_2 testing, cardiopulmonary stress testing, and indirect calorimetry using metabolic measurement system (ParvoMedics TrueOne)
- Isokinetic dynamometry using Biodex system
- Body composition analyses: Hydrodensitometry, multi-site skinfold caliper test, whole body air-displacement plethysmography (BODPOD)
- Cycle ergometry performance analysis using Monark Sports and Medical system
- Force plate analysis of human performance kinetics
- Maximal and submaximal graded exercise and strength testing administration
- Muscle oximetry utilizing NIRS and photoplethysmography

Small animal model research techniques

- Basic small animal handle and care
- Administration of exercise and dietary interventions for rodent models
- Small animal euthanasia and surgical techniques for hindlimb muscle and multi-organ isolation
- Post-surgery tissue sample treatment, care, and storage
- In vivo analysis of small animal body composition using dual x-ray absorptiometry
- In vivo measurement of small animal physical function: muscular contractile properties and sensorimotor coordination

Wet laboratory techniques

- Skeletal muscle immunohistochemistry and histology: Tissue fixation, cryostat operation, Avidin Biotin Complex (ABC) staining method, light microscopy, image acquisition, histological analysis (CSA, nuclei and protein quantification, etc)
- Reverse Transcriptase Polymerase Chain Reaction
- Western Blot
- RT-PCR and western blot band amplification and densitometric analysis (ChemiDoc and densitometry software)
- Enzyme Linked Immunosorbent Assay (ELISA)
- Protein assay using BCA method
- Automated serum analyzer (Sigma) operation
- Microplate reader (BioRad Model 680 and BioTek) operation
- General phlebotomy techniques (venipuncture)
- Blood lactate, glucose, and lipid measurement and analysis

AWARDS AND HONORS

2015 Science Council Club Advisor of the Year
California State Polytechnic University, Pomona

2015 College of Science Distinguished Teaching Award Finalist
California State Polytechnic University, Pomona

2014-2015 Cal Poly Pomona Intercollegiate Athletics Recognition of Appreciation
California State Polytechnic University, Pomona, Department of Athletics

Minority Scholarship 2011
National Strength and Conditioning Association Foundation

Glenn Society Inductee 2011
College of Human Sciences, Florida State University
Recognition of scholarly achievements and outstanding leadership

Outstanding Teaching Assistant Award Nominee 2011
Program for Instructional Excellence, Florida State University
University-wide recognition of outstanding performance as teaching assistant

Challenge Scholarship 2010
National Strength and Conditioning Association Foundation

Frances / Ricardo Moreno Scholarship Award 2009
College of Health and Human Sciences, California State University, Fullerton

Dean's List 2007-2009
College of Health and Human Services, California State University, Long Beach

Undergraduate Kinesiology Student of the Year 2006
Dept. of Kinesiology, College of Health and Human Services, California State University, Long Beach

NON-ACADEMIC PROFESSIONAL EXPERIENCE

Private Strength and Conditioning, Orange County and Los Angeles, CA
2001-2009
Private Certified Strength and Conditioning Specialist

Private Personal Training, Orange County and Los Angeles, CA
2001-2009
Private Certified Personal Trainer

Michael Seril Fitness, Inc., Whittier, CA
2004-2008
Certified Strength and Conditioning Specialist and Certified Personal Trainer

LA Fitness: Pro Results, La Habra, CA
2003-2005
Personal Fitness Trainer / Fitness Manager

Premier Results, Diamond Bar, CA
2003-2005
Personal Fitness Trainer

Body of Change, La Habra, CA
2001-2003
Personal Fitness Trainer

INTERNSHIPS

Care House, Anaheim, CA
Summer 2009

2 FAST 4 U, Fullerton, CA
Fall 2007-Spring 2008

YMCA Older Adult Fitness, Long Beach, CA
Spring 2005-Summer 2005

Bright Medical Center: Health education courses, Whittier, CA
Spring 2005-2007

Seal Beach Boeing, Seal Beach, CA
Spring 2005-Summer 2005

REFERENCES

Bahram H. Arjmandi, PhD, RD
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Email: barjmandi@fsu.edu

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Michael C. Zourdos, PhD, CSCS
Assistant Professor
Dept. of Exercise Science and Health Promotion
Florida Atlantic University
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Email: mzourdos@fau.edu

EXHIBIT B

BRETT ANDREW DOLEZAL, PH.D.

PUBLICATIONS (SINCE 2006)

PUBLICATION/BIBLIOGRAPHY

Research Papers – Peer Reviewed

1. Cooper, CB, **Dolezal, BA**, Riley, M, and PB Shieh. Reverse Fiber Type Disproportion: A Distinct Metabolic Myopathy. *Muscle and Nerve*, 2016.

2. **Dolezal, BA**, Waite, J, Neufeld, E, Boland, D and CB Cooper. Remotely-guided feedback enhances exercise training adherence and physical performance in firefighters. *International Journal of Sports Science*, 5(6), 221-227, 2015.

3. Rawson, RA, Chudzynski, J, Mooney, L, Gonzales, R, Ang, A, Dickerson, D, Penate, J, Salem, B, **Dolezal, BA** and CB Cooper. Impact of an exercise intervention on methamphetamine use outcomes post-residential treatment care. *Drug and Alcohol Dependence*, 156, 21-28, 2015.

4. Robertson, C, Ishibashi, K, Chudzynski, J, Mooney, L, Rawson, R, **Dolezal, BA**, Cooper, C, Brown, A, Mandelkern, M and ED London. Effect of Exercise Training on Striatal Dopamine D2/D2 Receptors in Methamphetamine Users during Behavioral Treatment. *Neuropsychopharmacology*, XX, 1-8, 2015.

5. Abrazado, M, **Dolezal, BA**, Storer, TW and CB Cooper. Effect of added weight on metabolic and cardiovascular responses to graded treadmill exercise in men. *International Journal of Sports Science*, 5(5), 187-191, 2015.

6. Rawson, RA, Chudzynski, J, Gonzales, R, Mooney, L, Dickerson, D, Ang, A, **Dolezal, BA** and CB Cooper. The impact of exercise on depression and anxiety symptoms among abstinent methamphetamine-dependent individuals in a residential treatment setting. *Journal of Substance Abuse Treatment*, 57, 36-40, 2015.

7. Haglund, M, Ang, A, Mooney, L, Gonzales, R, Chudzynski, J, Cooper, CB**, Dolezal, BA**, Gitlin, M and RA Rawson. Predictors of depression outcomes among abstinent methamphetamine-dependent individuals exposed to an exercise intervention. *The American Journal on Addictions*, 24, 246-251, 2015.

8. **Dolezal, BA**, Barr, D, Boland, DM, Smith, DS and CB Cooper. Validation of the firefighter WFI treadmill protocol for predicting VO2max. *Occupational Medicine*, 65(2), 143-6, 2015.

9. **Dolezal, BA**, Boland, D, Carney, J, Abrazado, M and CB Cooper. Validation of a physiological status monitor-embedded compression shirt against a criterion laboratory ECG-derived heart rate. *Journal of Occupational and Environmental Hygiene*, 2014.

10. **Dolezal, BA**, Chudzynski, J, Dickerson, D, Rawson, R, Garfinkel, A, and CB Cooper. Exercise Training Increases Heart Rate Variability after Methamphetamine-Dependency. *Med Sci Sport Exercise*, 46(6), 1057-1066, 2014.

11. **Dolezal BA**, Abrazado M, Batalin MA, Smith D and Cooper CB. Deployment of Remote Advanced Electrocardiography for Improved Cardiovascular Risk Assessment in Career Firefighters. *Journal of Telemedicine and e-Health*, 20(7), 1-4, 2014.

12. Smith, DL, Haller, JM, **Dolezal, BA**, Cooper, CB and PC Fehling. Evaluation of a wearable physiological status monitor during simulated firefighting activities. *Journal of Occupational and Environmental Hygiene*, 11, 427-433, 2014.

13. Storer, TW, **Dolezal, BA**, Berenc, M, Timmins, JE, and CB Cooper. Effect of supervised, periodized exercise training versus self-directed training on lean body mass and other fitness variables in health club members. *Journal of Strength and Conditioning Research*, 28(7), 1995-2006, 2014.

14. Mooney, LJ, Cooper, C, London, E, Chudzinski, J, **Dolezal, BA**, Dickerson, D, Brecht, M, Penate, J and R Rawson. Exercise for methamphetamine dependence: Rationale, design, and methodology. *Contemporary Clinical Trials*, 37, 139-147, 2014.

15. Storer, TW, **Dolezal, BA**, Abrazado, M, Smith, DL, Batalin, M, Tseng, C, Kaiser, W, and CB Cooper. Firefighter health and fitness assessment: A call to action. *Journal of Strength and Conditioning Research*, 28(3), 661-671, 2014.

16. **Dolezal, BA**, Lau, M, Abrazado, M, Storer, TW and CB Cooper. Validity of two commercial grade bioelectrical impedance analyzers for measurement of body fat percentage. *Journal of Exercise Physiology online*, 16(4), 74-83, 2013.

17. **Dolezal, BA**, Chudzynski, J, Storer, TW, Abrazado, M, Mooney, L, Dickerson, D, Rawson, R, and CB Cooper. Eight weeks of exercise training improves fitness measures in methamphetamine-dependent individuals in residential treatment. *Journal of Addiction Medicine*, 7(2), 122-128, 2013.

18. Batalin, M, Yuen, E, **Dolezal, BA**, Smith, D, Cooper, C and J. Mapar. PHASER: Physiological Health Assessment System for Emergency Responders. Body Sensor Networks, 2013.

<u>Research Papers – Peer Reviewed (Submitted)</u>

1. Carney, JJ, **Dolezal, BA**, Neufeld, E, Boland, DM, Martin, J, and CB Cooper. Characterization of sleep quality and cardiovascular reactivity measure via heart rate variability in emergency medical technicians.

2. **Dolezal, BA**, Storer, TW, Smooke, S, Tseng, C and CB Cooper. A systematic method to detect the metabolic threshold from gas exchange during incremental exercise. *BMC Pulmonary Medicine.*

3. **Dolezal, BA**, Sirichana, W and CB Cooper. Correlation of wrist-worn accelerometry with oxygen uptake.

4. Boland, D, **Dolezal, BA**, Chang, A, Lee, J and CB Cooper. Reliability of standing static posture analysis using a mobile application.

Research Papers – Non-Peer Reviewed

1. **Dolezal, BA**, Boland, D and CB Cooper. Digitizing the Ivory Tower of Academia. *iHealthBeat*, October 2014.

2. **Dolezal, BA**, Boland, D and CB Cooper. Marrying Academia and Industry to Validate the Wild Wild West of Wearables. *Nuviun*, October 2014.

Book - Chapter

1. Cooper CB, **Dolezal BA**. Chronic obstructive pulmonary disease. In: American College of Sports Medicine. *Exercise management for persons with chronic diseases and disabilities, 4th ed.* Champaign: Human Kinetics, 2016.

EXHIBIT 2

Lieff Cabraser Heimann & Bernstein
Attorneys at Law

Lieff Cabraser Heimann & Bernstein, LLP
250 Hudson Street, 8th Floor
New York, NY 10013-1413
t 212.355.9500
f 212.355.9592

November 16, 2015

Jonathan D. Selbin
Partner
jselbin@lchb.com

VIA CERTIFIED MAIL RETURN RECEIPT REQUESTED

Mr. Andy Missan, VP and General Counsel
Fitbit, Inc.
405 Howard Street, Suite 550
San Francisco, CA 94105

Registered Agent
CT Corporation
818 West Seventh Street, Suite 930
Los Angeles, CA 90017

RE: Notice Concerning Deceptive Practice under the California Consumer Legal Remedies Act

Dear Mr. Missan:

Together with my co-counsel Robert Klonoff, I write on behalf of our client Kate Mclellan to provide written notice pursuant to the California Consumer Legal Remedies Act, California Civil Code Section 1750 *et seq*. (the "CLRA"), and specifically, Sections 1782(a)(1) and (2). On behalf of herself and all others similarly situated (the "Proposed Class"), Ms. Mclellan hereby notifies you that Fitbit, Inc. ("Fitbit) is alleged to have violated the CLRA and engaged in unfair, deceptive, fraudulent, and other unlawful conduct by falsely advertising its Fitbit "Charge HR" and "Surge" models, which employ the same PurePulse™ technology (the "Fitbit PurePulse Models"), as detailed below. This letter also serves to provide any required notice that Fitbit has breached express and/or implied warranties with respect to the Fitbit PurePulse Models.

Ms. Mclellan purchased her Fitbit Charge HR on February 27, 2015, at Sports Chalet in Temecula, California. The watch retailed for $149.95 and cost her $161.94 after tax.

Fitbit has engaged—and is engaged—in an extensive and widespread advertising campaign in which it expressly represents and markets the Fitbit PurePulse Models based upon their purported ability to accurately record heart rates, even during high intensity workouts. For example, Fitbit represents to consumers that the heart rate monitors "measure heart rate automatically and continuously" and allow users to "accurately track workout intensity."

Similarly, Fitbit advertises the Fitbit PurePulse Models with slogans such as: "The Difference Between Good and Great...Is Heart"; "For Better Fitness, Start with Heart"; "Get More Benefits with Every Beat—Without An Uncomfortable Chest Strap"; and "Every Beat Counts." Importantly, those advertisements depict users utilizing the heart rate function of their watches in a variety of high intensity exercises. Fitbit charges a premium for the heart rate function, as demonstrated by the $20 price differential between the Charge and Charge HR which are distinguished only by the PurePulse technology.

In fact, as Ms. Mclellan and many other purchasers of the Fitbit PurePulse Models have discovered, the heart rate monitor feature Fitbit advertises the Fitbit PurePulse Models as having—and for which it charges a price premium—fails to accurately record heart rates, particularly during high intensity exercise. Ms. Mclellan has observed this inaccuracy during a wide range of activities and exercises. Upon informing Fitbit of these problems, Ms. Mclellan was instructed to reboot her Fitbit PurePulse Model and to heed user manual instructions. She did both, to no effect.

Upon information and belief, this defect is well known to Fitbit, as it has received scores of complaints regarding the inability of the Fitbit PurePulse Models to accurately measure heart rates, and has conceded to at least some complainants that the heart rate monitors are accurate only at rest. Accordingly, it appears Fitbit knowingly manufactured and sold, and continues to sell, the PurePulse Models with a known defect and that do not function as expressly represented and warranted. Fitbit thus misrepresented the nature and characteristics of the Fitbit PurePulse Models and knowingly omitted and failed to disclose the presence of the defect to Ms. Mclellan and the Proposed Class.

Fitbit's conduct as summarized here constitutes a violation of Cal. Civ. Code § 1770(a); specifically, Fitbit violated—and continues to violate—the CLRA by, among other things:

1. Representing through advertising, warranties, and other express representations, that the Fitbit PurePulse Models had characteristics, benefits, or uses that they did not have;

2. Falsely representing that the Fitbit PurePulse Models are of a particular standard, quality, and/or grade when they are of another;

3. Representing that a transaction confers or involves rights, remedies, or obligations which it does not have or involve;

4. Advertising the Fitbit PurePulse Models with the intent not to sell them as advertised;

5. Failing to disclose that the Fitbit PurePulse Models have a defect, which is a material fact, the omission of which tends to mislead or deceive the

consumer, and a fact that could not reasonably be known by the consumer;

6. Failing to disclose the Fitbit PurePulse Models' defect with the intent that consumers rely on the concealment or omission in connection with their decisions to purchase the subject heart rate watches;

7. Failing to properly repair the Fitbit PurePulse Models to correct or eliminate the defect; and

8. Other unfair or deceptive conduct or practices in trade or commerce with respect to the marketing, advertising, sale and warranty/customer service of the Fitbit PurePulse Models.

Fitbit's conduct also violates California's Unfair Competition Law, California Business and Professions Code Section 17200, and constitutes common law fraud, fraudulent inducement to contract, and breach of express and implied warranties.

Ms. Mclellan and the Proposed Class have all suffered actual damages as a result of this conduct, including but not limited to, the original cost of the Fitbit PurePulse Models and/or the premium paid for them. Notably, for many purchasers who use their Fitbit PurePulse Models to monitor heart rate for medical and/or health reasons, the failure of the Fitbit PurePulse Models to accurately measure heart rate poses a health and safety risk as well.

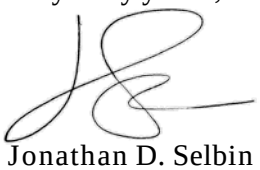
Ms. Mclellan and the Proposed Class hereby demand that within thirty (30) days of receiving this letter, Fitbit agree to (1) cease all false and misleading statements and advertising of the heart rate monitoring feature of the Fitbit PurePulse Models and (2) offer all Proposed Class members the option to either return their Fibit PurePulse Models for a full refund or, alternatively, to retain the watches and receive a refund of the difference in price between the Fitbit PurePulse Models and those models without the heart rate monitoring feature. Unless Fitbit agrees to do so within the thirty-day timeframe, we intend to bring claims for damages as permitted by Cal. Civ. Code § 1782(d) in addition to our claims of equitable, injunctive, and other relief available under applicable law, and for attorneys' fees.

Finally, a note regarding forced arbitration, class action bans, and limitations on statutes of limitation. Any attempt by Fitbit to prohibit Ms. Mclellan and Proposed Class members from vindicating their substantive statutory rights under California law, and their constitutional rights to a jury trial and to petition for redress, through post-purchase imposition of an undisclosed arbitration clause, class action ban, and claim period limitation, is legally invalid and unenforceable as a matter of law. Whatever the enforceability of such clauses on consumers who purchased their Fitbit PurePulse Models *directly* from Fitbit's website, Proposed Class members—including Ms. Mclellan—who did not purchase their watches directly from Fitbit but instead through third party vendors (either in-person or on-line) did *not* agree to arbitrate at the time they purchased their Fitbit PurePulse Models. Nothing on any of the presale marketing or displays available at such vendors, nor the product packaging itself,

disclosed or directed these Proposed Class members to any terms of service including such provisions. Nor were Proposed Class members provided any advance notice that a post-purchase agreement to such terms would be necessary to enable them to "use their activity tracker as intended" or to activate the devices' most basic functions, a fact your Vice President for Customer Support attested to under oath. (See Ex. A hereto). Those post-purchase clauses are therefore invalid and unenforceable as to Ms. Mclellan and Proposed Class members, and may themselves evidence and constitute an unfair and deceptive business practice and fraudulent scheme to defraud consumers and/or deceive them into waiving their rights.

We sincerely hope to confer with you to resolve these violations without the need for litigation. I invite you to contact me to discuss this demand at any time. I can be reached at (212) 355-9500 or jselbin@lchb.com. I look forward to hearing from you.

Very truly yours,



Jonathan D. Selbin

JDS/krb

cc: Robert Klonoff
Elizabeth Cabraser
Kevin Budner

1280554.4

EXHIBIT A

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Attorneys for Defendant
FITBIT, INC.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

JAMES P. BRICKMAN, individually and as a representative of all others similarly situated,

Plaintiff,

v.

FITBIT, INC.,

Defendant.

Case No. 3:15-cv-2077-JD

DECLARATION OF ERIN M. BOSMAN IN SUPPORT OF DEFENDANT FITBIT, INC.'S MOTION TO COMPEL ARBITRATION AND DISMISS LITIGATION

Date: November 4, 2015
Time: 10:00 a.m.
Ctrm: 11, 19th Floor

The Honorable James Donato

Date Action Filed: May 8, 2015

I, ERIN M. BOSMAN, hereby declare as follows:

1. I am an attorney admitted to practice in the State of California and am a member of good standing in the state bar. I am a partner with the law firm of Morrison & Foerster LLP, and counsel of record for Defendant Fitbit, Inc. ("Fitbit") in the above captioned action. Statements made in this Declaration are based on my personal knowledge, and I could and would so testify if called as a witness in this matter.

2. Before this Motion to Compel Arbitration was filed, I informed Plaintiff Mallick's counsel at Dworken & Bernstein Co. L.P.A. via correspondence that claims relating to the Fitbit Charge HR™ ("Charge HR") were subject to arbitration.

3. I explained to Plaintiff's counsel that Fitbit would file a motion to compel arbitration if Plaintiff's counsel did not agree to arbitrate Ms. Mallick's dispute relating to the Charge HR. In addition, I explained to Plaintiff's Counsel that Ms. Mallick assented to the class action waiver in Fitbit's Terms of Service.

4. Attached as Exhibit 1 is a true and correct copy of the letter sent to Dworken & Bernstein Co., L.P.A., on September 8, 2015, notifying Plaintiff's Counsel that Fitbit's records indicate that Ms. Mallick agreed to the Terms of Service, including the following two provisions: (1) "You and Fitbit agree to resolve any Disputes through final and binding arbitration, except as set forth under Exceptions to Agreement to Arbitrate below" and (2) "You may only resolve Disputes with Fitbit on an individual basis and may not bring a claim as a plaintiff or a class member in a class, consolidate, or representative action. Class arbitrations, class action, private attorney general action, and consolidation with other arbitrations aren't allowed under our agreement."

I declare under penalty of perjury that the foregoing is true and correct. Executed this 30th day of September, 2015, in San Francisco, California.

s/ Erin M. Bosman
Erin M. Bosman

EXHIBIT 3

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www.zlk.com

Andrea Clisura
aclisura@zlk.com

February 22, 2016

Via Certified Mail – Return Receipt Requested

Fitbit, Inc.
405 Howard Street, Suite 550
San Francisco, California 94105

Re: Demand Letter Pursuant to California Civil Code § 1782 and other applicable laws

To Whom It May Concern:

This letter serves as a notice and demand for corrective action on behalf of my clients, Judith Landers, Lisa Marie Burke, and John Molenstra, and all other persons similarly situated, arising from violations of state law including the California Consumer Legal Remedies Act, Civil Code § 1770, including but not limited to subsections (a)(5), (7), and (9). This letter also serves to provide any required notice concerning breaches of express and implied warranties described herein, and any other statutes or causes of action requiring notice.

You have participated in the manufacture, marketing, and sale of Fitbit Charge HR (the "Charge HR") and Fitbit Surge (the "Surge") wristband activity trackers, which feature the same PurePulse™ heart rate technology (the "PurePulse Devices"). In various marketing materials, including but not limited to webpages, and video and print advertisements, you misrepresent that the PurePulse Devices have the ability to accurately record and report users' heart rates, including during vigorous exercise. For example, you specifically represent to consumers that the PurePulse Devices provide "continuous, automatic," and "real-time heart rate," so that users can "[g]et instant heart rate readings all day, every day" and "track[] [their] heart rate all day and during exercise." These claims are repeated and reinforced through other marketing materials, including advertising slogans such as "Every beat counts," and advertisements depicting users utilizing the heart rate feature while engaging in vigorous exercise, such as jumping rope, boxing, jogging, and running, as well as sit-ups and squats.

Our clients, residents of New York and Illinois, each purchased a PurePulse Device based on these representations that the products would accurately record their heart rate, including during exercise.

The claims you make concerning the PurePulse Devices are false and misleading. As our clients discovered after purchasing and using the PurePulse Devices, they do not have the ability

advertised and instead misreport and frequently understate our clients' heart rates. Our clients are not alone in their complaints about the PurePulse Devices. Numerous online comments and reviews from users of PurePulse Devices complain that they do not accurately report users' heart rates, particularly during exercise. In addition to misrepresenting the benefits and capabilities of the PurePulse Devices, you have failed to disclose this product defect. Our clients would not have purchased the PurePulse Devices or would have paid less for the PurePulse Devices had they known the true facts.

Moreover, our clients each purchased their PurePulse Devices through third party vendors and did not agree to arbitrate any claims at the time they purchased their PurePulse Devices. Nothing on any presale or point of sale marketing materials, nor the product packaging itself, disclosed or directed purchasers such as our clients to any terms of service including any arbitration clause, class action ban, or claim period limitation. Nor were such purchasers provided any advanced notice that a post-purchase agreement to such terms would be necessary to enable them to use their PurePulse Devices as intended. Thus, these clauses are invalid and unenforceable as to our clients and those similarly situated, and themselves constitute an unfair and deceptive business practice.

Our clients are acting on behalf of a proposed class of similarly situated purchasers throughout the United States, and subclasses of purchasers who purchased PurePulse Devices in New York and Illinois.

To cure the defects described above, we demand that you (1) cease and desist from continuing to misrepresent the ability of the PurePulse Devices to record users' heart rates; and (2) make full restitution to all purchasers of the PurePulse Devices of all purchase money wrongly obtained from sales thereof.

We further demand that you preserve all documents and other evidence which refer or relate to any of the above-described practices including, but not limited to, the following:

1. All documents concerning the design, manufacture, and testing of the PurePulse Devices;

2. All documents concerning the advertisement and marketing of the PurePulse Devices;

3. All documents concerning the sale of the PurePulse Devices, including the total amount of money generated from the sale of the PurePulse Devices;

4. All communications, including but not limited to communications with customers and retailers, concerning complaints or comments relating to the PurePulse Devices; and

5. All documents concerning the identity of individuals, retailers, and/or distributers who purchased PurePulse Devices.

We are willing to negotiate to attempt to resolve the demands asserted in this letter. If you wish to enter into such discussions, please contact me immediately. If you contend that any

statement in this letter is inaccurate in any respect, please provide us with your contentions and supporting documents promptly.

Sincerely,

Andrea Clisura
Levi & Korsinsky, LLP

EXHIBIT 4

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December 16, 2015

Writer's Direct Contact
+1 (858) 720.5178
EBosman@mofo.com

Via E-Mail and U.S. Mail

Jonathan D. Selbin
Lieff Cabraser Heimann & Bernstein
250 Hudson Street, 8th Floor
New York, NY 10013-1413

Re: Fitbit's Response to Mclellan CLRA Demand Letter

Dear Mr. Selbin:

We represent Fitbit, Inc., and write in response to your November 16, 2015 letter to Fitbit's General Counsel Andy Missan, on behalf of Kate Mclellan (attached hereto as Exhibit A).

As you are aware from Erin Bosman's letter to Frank Bartela of September 8, 2015 (which is attached to your November 16 letter), the Fitbit Terms of Service include an agreement to arbitrate, as well as a class action waiver. Accordingly, your desire to resolve Ms. Mclellans' grievance without litigation is well-placed. In fact, Ms. Mclellan cannot litigate her claim and cannot represent a class. Instead, any dispute she has with Fitbit is subject to arbitration.

In your letter, you contend that the post-purchase agreement to arbitrate is invalid and unenforceable. That is incorrect. On November 10, 2015, the Honorable James Donato heard these very issues in *Brickman v. Fitbit, Inc.* and found that Fitbit's arbitration agreement was valid and enforceable.

In *Brickman*, the plaintiff, Stephanie Mallick, had purchased a Charge HR product in January 2015. Accordingly, she had been presented with, and accepted, the Terms of Service including the arbitration agreement and class action waiver. Nevertheless, she argued that because the agreement was presented to her after purchase, there was no consideration.

Ninth Circuit precedent holds otherwise. *See Circuit City Stores, Inc. v. Najd*, 294 F.3d 1104 (9th Cir. 2002). *Circuit City* holds that the defendant's reciprocal "promise to submit to arbitration and to forego the option of a judicial forum for a specified class of claims constitutes sufficient consideration.

Judge Donato agreed. In response to plaintiff's contention that the arbitration clause was unenforceable, he stated that "I don't think you have a leg to stand on." He went on to explain: "The arbitration clause here is bilateral. It has a 30-day opt-out. It has Fitbit paying – picking up the tab up to $75,000, and waiving attorneys' fees – all of that under current Ninth Circuit law says that's perfectly fine." (*Brickman v. Fitbit, Inc.*, No. 3:15-cv-2077-JD, Hearing Tr. (N.D. Cal. Nov. 10, 2015), at 6:17-7:2.)

Your client is in the exact same position as Ms. Mallick. In fact, all Charge HR and Surge users are bound by the arbitration agreement and class action waiver, and will be compelled to individually arbitrate similar claims—or any other claims for that matter—against Fitbit.

Fitbit also has strong defenses on the merits of your client's claims, but addresses here only the threshold issue of arbitration and reserves the right to raise these defenses in the appropriate forum.

Should your client wish to have her grievances heard despite their lack of merit, she is welcome to initiate arbitration against Fitbit in accordance with the Terms of Service she agreed to. Please let us know if this is how she would like to proceed. We would be happy to work with you to facilitate the process, including Fitbit's payment of arbitration fees as specified in the Terms of Service, assuming that your client's individual claim is less than $75,000.

Please let us know if you have any questions or would like to discuss the matter further.

Sincerely,

Erin M. Bosman

Attachment

cc: William L. Stern
Julie Y. Park

Lieff Cabraser Heimann & Bernstein
Attorneys at Law

Lieff Cabraser Heimann & Bernstein, LLP
250 Hudson Street, 8th Floor
New York, NY 10013-1413
t 212.355.9500
f 212.355.9592

November 16, 2015

Jonathan D. Selbin
Partner
jselbin@lchb.com

VIA CERTIFIED MAIL RETURN RECEIPT REQUESTED

Mr. Andy Missan, VP and General Counsel
Fitbit, Inc.
405 Howard Street, Suite 550
San Francisco, CA 94105

Registered Agent
CT Corporation
818 West Seventh Street, Suite 930
Los Angeles, CA 90017

RE: Notice Concerning Deceptive Practice under the California Consumer Legal Remedies Act

Dear Mr. Missan:

Together with my co-counsel Robert Klonoff, I write on behalf of our client Kate Mclellan to provide written notice pursuant to the California Consumer Legal Remedies Act, California Civil Code Section 1750 *et seq.* (the "CLRA"), and specifically, Sections 1782(a)(1) and (2). On behalf of herself and all others similarly situated (the "Proposed Class"), Ms. Mclellan hereby notifies you that Fitbit, Inc. ("Fitbit) is alleged to have violated the CLRA and engaged in unfair, deceptive, fraudulent, and other unlawful conduct by falsely advertising its Fitbit "Charge HR" and "Surge" models, which employ the same PurePulse™ technology (the "Fitbit PurePulse Models"), as detailed below. This letter also serves to provide any required notice that Fitbit has breached express and/or implied warranties with respect to the Fitbit PurePulse Models.

Ms. Mclellan purchased her Fitbit Charge HR on February 27, 2015, at Sports Chalet in Temecula, California. The watch retailed for $149.95 and cost her $161.94 after tax.

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Similarly, Fitbit advertises the Fitbit PurePulse Models with slogans such as: "The Difference Between Good and Great...Is Heart"; "For Better Fitness, Start with Heart"; "Get More Benefits with Every Beat—Without An Uncomfortable Chest Strap"; and "Every Beat Counts." Importantly, those advertisements depict users utilizing the heart rate function of their watches in a variety of high intensity exercises. Fitbit charges a premium for the heart rate function, as demonstrated by the $20 price differential between the Charge and Charge HR which are distinguished only by the PurePulse technology.

In fact, as Ms. Mclellan and many other purchasers of the Fitbit PurePulse Models have discovered, the heart rate monitor feature Fitbit advertises the Fitbit PurePulse Models as having—and for which it charges a price premium—fails to accurately record heart rates, particularly during high intensity exercise. Ms. Mclellan has observed this inaccuracy during a wide range of activities and exercises. Upon informing Fitbit of these problems, Ms. Mclellan was instructed to reboot her Fitbit PurePulse Model and to heed user manual instructions. She did both, to no effect.

Upon information and belief, this defect is well known to Fitbit, as it has received scores of complaints regarding the inability of the Fitbit PurePulse Models to accurately measure heart rates, and has conceded to at least some complainants that the heart rate monitors are accurate only at rest. Accordingly, it appears Fitbit knowingly manufactured and sold, and continues to sell, the PurePulse Models with a known defect and that do not function as expressly represented and warranted. Fitbit thus misrepresented the nature and characteristics of the Fitbit PurePulse Models and knowingly omitted and failed to disclose the presence of the defect to Ms. Mclellan and the Proposed Class.

Fitbit's conduct as summarized here constitutes a violation of Cal. Civ. Code § 1770(a); specifically, Fitbit violated—and continues to violate—the CLRA by, among other things:

1. Representing through advertising, warranties, and other express representations, that the Fitbit PurePulse Models had characteristics, benefits, or uses that they did not have;

2. Falsely representing that the Fitbit PurePulse Models are of a particular standard, quality, and/or grade when they are of another;

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4. Advertising the Fitbit PurePulse Models with the intent not to sell them as advertised;

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consumer, and a fact that could not reasonably be known by the consumer;

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7. Failing to properly repair the Fitbit PurePulse Models to correct or eliminate the defect; and

8. Other unfair or deceptive conduct or practices in trade or commerce with respect to the marketing, advertising, sale and warranty/customer service of the Fitbit PurePulse Models.

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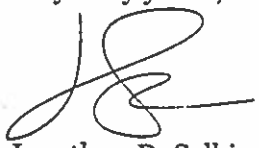
We sincerely hope to confer with you to resolve these violations without the need for litigation. I invite you to contact me to discuss this demand at any time. I can be reached at (212) 355-9500 or jselbin@lchb.com. I look forward to hearing from you.

Very truly yours,



Jonathan D. Selbin

JDS/krb

cc: Robert Klonoff
Elizabeth Cabraser
Kevin Budner

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Attorneys for Defendant
FITBIT, INC.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

JAMES P. BRICKMAN, individually and as a representative of all others similarly situated,

Plaintiff,

v.

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Time: 10:00 a.m.
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The Honorable James Donato

Date Action Filed: May 8, 2015

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1. I am an attorney admitted to practice in the State of California and am a member of good standing in the state bar. I am a partner with the law firm of Morrison & Foerster LLP, and counsel of record for Defendant Fitbit, Inc. ("Fitbit") in the above captioned action. Statements made in this Declaration are based on my personal knowledge, and I could and would so testify if called as a witness in this matter.

2. Before this Motion to Compel Arbitration was filed, I informed Plaintiff Mallick's counsel at Dworken & Bernstein Co. L.P.A. via correspondence that claims relating to the Fitbit Charge HR™ ("Charge HR") were subject to arbitration.

3. I explained to Plaintiff's counsel that Fitbit would file a motion to compel arbitration if Plaintiff's counsel did not agree to arbitrate Ms. Mallick's dispute relating to the Charge HR. In addition, I explained to Plaintiff's Counsel that Ms. Mallick assented to the class action waiver in Fitbit's Terms of Service.

4. Attached as Exhibit 1 is a true and correct copy of the letter sent to Dworken & Bernstein Co., L.P.A., on September 8, 2015, notifying Plaintiff's Counsel that Fitbit's records indicate that Ms. Mallick agreed to the Terms of Service, including the following two provisions: (1) "You and Fitbit agree to resolve any Disputes through final and binding arbitration, except as set forth under Exceptions to Agreement to Arbitrate below" and (2) "You may only resolve Disputes with Fitbit on an individual basis and may not bring a claim as a plaintiff or a class member in a class, consolidate, or representative action. Class arbitrations, class action, private attorney general action, and consolidation with other arbitrations aren't allowed under our agreement."

I declare under penalty of perjury that the foregoing is true and correct. Executed this 30th day of September, 2015, in San Francisco, California.

s/ Erin M. Bosman
Erin M. Bosman

EXHIBIT 1

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MORRISON & FOERSTER LLP

BEIJING, BERLIN, BRUSSELS, DENVER, HONG KONG, LONDON, LOS ANGELES, NEW YORK, NORTHERN VIRGINIA, PALO ALTO, SACRAMENTO, SAN DIEGO, SAN FRANCISCO, SHANGHAI, SINGAPORE, TOKYO, WASHINGTON, D.C.

September 8, 2015

Writer's Direct Contact
+1 (858) 720.5178
EBosman@mofo.com

Via E-Mail

Patrick J. Perotti
Frank A. Bartela
DWORKEN & BERNSTEIN CO., L.P.A.
60 South Park Place
Plainesville, Ohio 44077

Re: Demand for Arbitration
Brickman v. Fitbit Inc., Case No. 3:15-cv-2077

Dear Counsel:

This letter contains Fitbit's demand for arbitration concerning the claims brought by your client, Stephanie Mallick. Ms. Mallick agreed to arbitrate her claims against Fitbit under Fitbit's Terms of Service. A copy of the Terms of Service, which were published on Fitbit's website on December 18, 2014, is attached to this letter at **Exhibit A.** Specifically, Ms. Mallick agreed to arbitrate on the same day she purchased and paired her Charge HR for the first time: February 4, 2015.

When a Fitbit user sets up an account, the user is prompted to agree to the Terms of Service and the Privacy Policy. A hyperlink allows the customer to review these documents before agreeing to their terms. The user must then affirmatively check the box indicating, "I agree to the Terms of Service and the Privacy Policy."

In the Dispute Resolution section of the Terms of Service, there is a heading stating "**We Both Agree To Arbitrate.**" The text below this bolded heading reads, "You and Fitbit agree to resolve any Disputes through final and binding arbitration, except as set forth under Exceptions to Agreement to Arbitrate below."[1] Directly below the agreement to arbitrate,

[1] The Agreement to Arbitrate in the Terms of Service has two exceptions for customers with claims under a certain monetary threshold. First, they provide an exception to arbitration for claims brought in small claims court. Second, under the Terms of Sale, Fitbit provides that it "will pay all arbitration fees for claims less than $75,000." (*Id.*) Neither applies to Ms. Mallick's claims.

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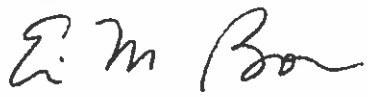
there is another heading explaining how to "**Opt-out of Agreement to Arbitrate.**" This opt-out section allows that "you can decline this agreement to arbitrate by contacting legal@fitbit.com within 30 days of first accepting these Terms and stating that you (include your first and last name) decline this arbitration agreement." The Terms of Service provide that the "American Arbitration Association (AAA) will administer the arbitration under its Commercial Arbitration Rules and the Supplementary Procedures for Consumer Related Disputes."

Ms. Mallick also agreed that she would not bring a claim as a plaintiff or a class member in a class. Under the Dispute Resolution section there is a heading "**No Class Actions.**" This section provides: "You may only resolve Disputes with Fitbit on an individual basis and may not bring a claim as a plaintiff or a class member in a class, consolidate, or representative action. Class arbitrations, class action, private attorney general action, and consolidation with other arbitrations aren't allowed under our agreement."

Ms. Mallick agreed to the terms of service and she is bound by them. She did not opt out of the arbitration procedures.

Please confirm that you will dismiss Ms. Mallick as a plaintiff from the above referenced case. Otherwise, we will be forced to move to compel individual arbitration of her clams.

Sincerely,



Erin M. Bosman

Attachment

cc: William L. Stern
James W. Huston
Julie Y. Park

sd-668253

EXHIBIT 5

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March 22, 2016

Writer's Direct Contact
+1 (858) 720.5178
EBosman@mofo.com

Via E-Mail and U.S. Mail

Andrea Clisura
Levi & Korinsky LLP
30 Broad Street, 24th Floor
New York, NY 10004

Re: *Fitbit's Response to Landers CLRA Demand Letter*

Dear Ms. Clisura:

We represent Fitbit, Inc., and write in response to your February 22, 2016 letter to Fitbit on behalf of Judith Landers, et al. (attached hereto as Exhibit A).

As you are aware, the Fitbit Terms of Service include an agreement to arbitrate, as well as a class action waiver. Accordingly, your desire to resolve Ms. Landers' grievance without litigation is well-placed. In fact, Ms. Landers cannot litigate her claim and cannot represent a class. Instead, any dispute she has with Fitbit is subject to arbitration.

In your letter, you contend that the post-purchase agreement to arbitrate is invalid and unenforceable. That is incorrect. On November 10, 2015, the Honorable James Donato heard these very issues in *Brickman v. Fitbit, Inc.* and found that Fitbit's arbitration agreement was valid and enforceable.

In *Brickman*, the plaintiff, Stephanie Mallick, had purchased a Charge HR product in January 2015. Accordingly, she had been presented with, and accepted, the Terms of Service including the arbitration agreement and class action waiver. Nevertheless, she argued that because the agreement was presented to her after purchase, there was no consideration.

Ninth Circuit precedent holds otherwise. *See Circuit City Stores, Inc. v. Najd*, 294 F.3d 1104 (9th Cir. 2002). *Circuit City* holds that the defendant's reciprocal "promise to submit to arbitration and to forego the option of a judicial forum for a specified class of claims constitutes sufficient consideration."

Judge Donato agreed. In response to plaintiff's contention that the arbitration clause was unenforceable, he stated that "I don't think you have a leg to stand on." He went on to

explain: "The arbitration clause here is bilateral. It has a 30-day opt-out. It has Fitbit paying – picking up the tab up to $75,000, and waiving attorneys' fees – all of that under current Ninth Circuit law says that's perfectly fine." (*Brickman v. Fitbit, Inc.*, No. 3:15-cv-2077-JD, Hearing Tr. (N.D. Cal. Nov. 10, 2015), at 6:17-7:2.)

Your client is in the exact same position as Ms. Mallick. In fact, all Charge HR and Surge users are bound by the arbitration agreement and class action waiver, and will be compelled to individually arbitrate similar claims—or any other claims for that matter—against Fitbit.

Fitbit also has strong defenses on the merits of your client's claims, but addresses here only the threshold issue of arbitration and reserves the right to raise these defenses in the appropriate forum.

Should your client wish to have her grievances heard despite their lack of merit, she is welcome to initiate arbitration against Fitbit in accordance with the Terms of Service she agreed to. Please let us know if this is how she would like to proceed. We would be happy to work with you to facilitate the process, including Fitbit's payment of arbitration fees as specified in the Terms of Service, assuming that your client's individual claim is less than $75,000.

Please let us know if you have any questions or would like to discuss the matter further.

Sincerely,

Erin M. Bosman

Attachment

cc: William L. Stern
Julie Y. Park

sd-678397

EXHIBIT A

LEVI&KORSINSKY LLP

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Andrea Clisura
aclisura@zlk.com

February 22, 2016

Via Certified Mail – Return Receipt Requested

Fitbit, Inc.
405 Howard Street, Suite 550
San Francisco, California 94105

Re: Demand Letter Pursuant to California Civil Code § 1782 and other applicable laws

To Whom It May Concern:

This letter serves as a notice and demand for corrective action on behalf of my clients, Judith Landers, Lisa Marie Burke, and John Molenstra, and all other persons similarly situated, arising from violations of state law including the California Consumer Legal Remedies Act, Civil Code § 1770, including but not limited to subsections (a)(5), (7), and (9). This letter also serves to provide any required notice concerning breaches of express and implied warranties described herein, and any other statutes or causes of action requiring notice.

You have participated in the manufacture, marketing, and sale of Fitbit Charge HR (the "Charge HR") and Fitbit Surge (the "Surge") wristband activity trackers, which feature the same PurePulse™ heart rate technology (the "PurePulse Devices"). In various marketing materials, including but not limited to webpages, and video and print advertisements, you misrepresent that the PurePulse Devices have the ability to accurately record and report users' heart rates, including during vigorous exercise. For example, you specifically represent to consumers that the PurePulse Devices provide "continuous, automatic," and "real-time heart rate," so that users can "[g]et instant heart rate readings all day, every day" and "track[] [their] heart rate all day and during exercise." These claims are repeated and reinforced through other marketing materials, including advertising slogans such as "Every beat counts," and advertisements depicting users utilizing the heart rate feature while engaging in vigorous exercise, such as jumping rope, boxing, jogging, and running, as well as sit-ups and squats.

Our clients, residents of New York and Illinois, each purchased a PurePulse Device based on these representations that the products would accurately record their heart rate, including during exercise.

The claims you make concerning the PurePulse Devices are false and misleading. As our clients discovered after purchasing and using the PurePulse Devices, they do not have the ability

advertised and instead misreport and frequently understate our clients' heart rates. Our clients are not alone in their complaints about the PurePulse Devices. Numerous online comments and reviews from users of PurePulse Devices complain that they do not accurately report users' heart rates, particularly during exercise. In addition to misrepresenting the benefits and capabilities of the PurePulse Devices, you have failed to disclose this product defect. Our clients would not have purchased the PurePulse Devices or would have paid less for the PurePulse Devices had they known the true facts.

Moreover, our clients each purchased their PurePulse Devices through third party vendors and did not agree to arbitrate any claims at the time they purchased their PurePulse Devices. Nothing on any presale or point of sale marketing materials, nor the product packaging itself, disclosed or directed purchasers such as our clients to any terms of service including any arbitration clause, class action ban, or claim period limitation. Nor were such purchasers provided any advanced notice that a post-purchase agreement to such terms would be necessary to enable them to use their PurePulse Devices as intended. Thus, these clauses are invalid and unenforceable as to our clients and those similarly situated, and themselves constitute an unfair and deceptive business practice.

Our clients are acting on behalf of a proposed class of similarly situated purchasers throughout the United States, and subclasses of purchasers who purchased PurePulse Devices in New York and Illinois.

To cure the defects described above, we demand that you (1) cease and desist from continuing to misrepresent the ability of the PurePulse Devices to record users' heart rates; and (2) make full restitution to all purchasers of the PurePulse Devices of all purchase money wrongly obtained from sales thereof.

We further demand that you preserve all documents and other evidence which refer or relate to any of the above-described practices including, but not limited to, the following:

1. All documents concerning the design, manufacture, and testing of the PurePulse Devices;

2 All documents concerning the advertisement and marketing of the PurePulse Devices;

3. All documents concerning the sale of the PurePulse Devices, including the total amount of money generated from the sale of the PurePulse Devices;

4. All communications, including but not limited to communications with customers and retailers, concerning complaints or comments relating to the PurePulse Devices; and

5. All documents concerning the identity of individuals, retailers, and/or distributers who purchased PurePulse Devices.

We are willing to negotiate to attempt to resolve the demands asserted in this letter. If you wish to enter into such discussions, please contact me immediately. If you contend that any

statement in this letter is inaccurate in any respect, please provide us with your contentions and supporting documents promptly.

Sincerely,

Andrea Clisura
Levi & Korsinsky, LLP