

This study, completed in November 2013, was carried out by Precision Fabrics Group, Inc., Greensboro, North Carolina. The principal investigator was Terry Montgomery, PhD.

STUDY DESIGN

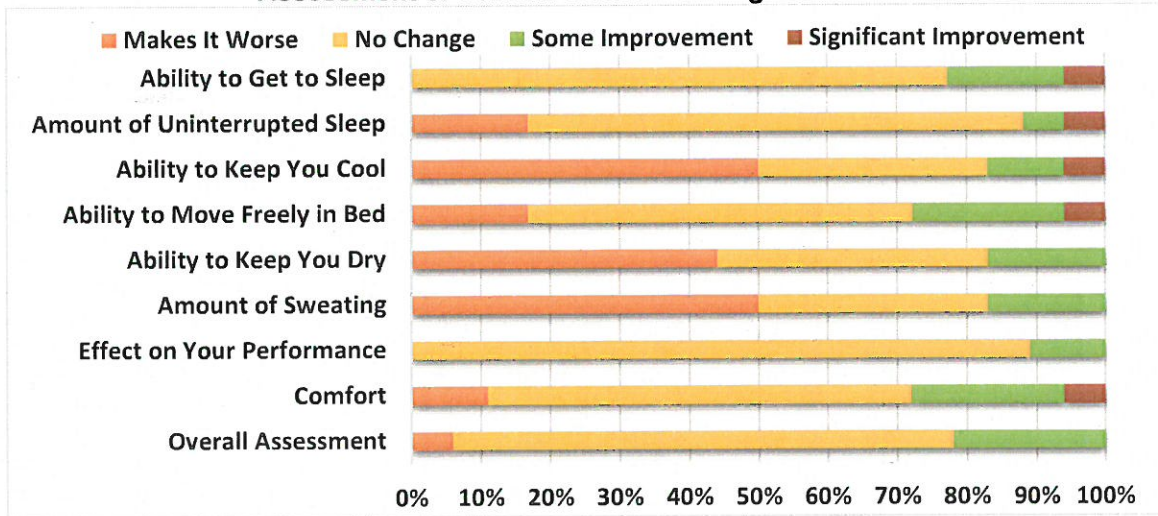
This study involved participants highly active in running sports (marathons, ultra-marathons). Eighteen subjects (67% male, 33% female) enrolled in and completed the study. Study participants were assigned to sleep on the DermaTherapy® Therapeutic Bedding, in the form of a bedding set that included a pillow case, a flat top sheet, and a fitted bottom sheet. The study consisted of a four-week Treatment Phase.

The primary outcome was a determination of perceptions and assessments from the athletes of the bedding as measured using a detailed *Quality of Life* Questionnaire at Baseline and Week 4.

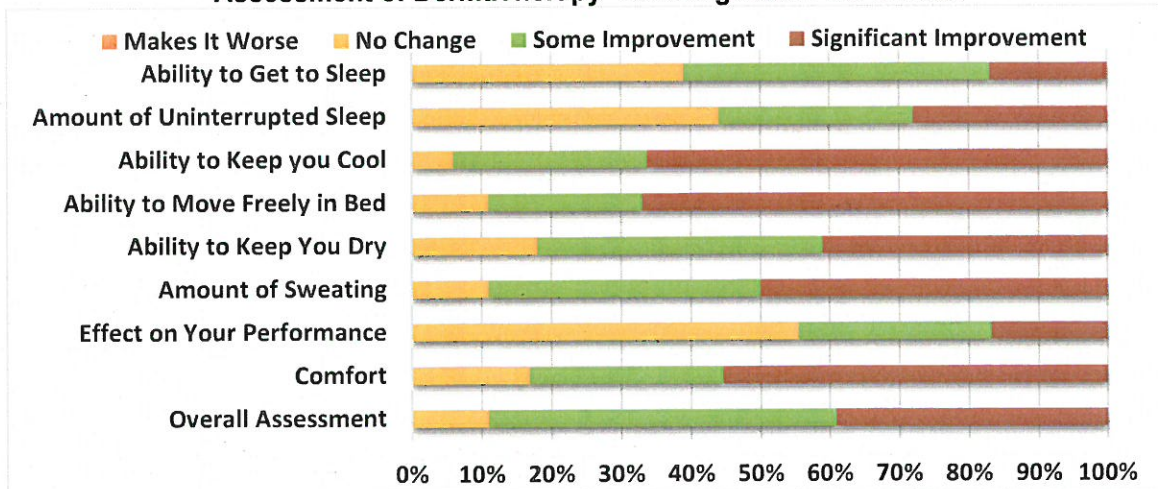
In the charts that follow, "Baseline" results depict assessments of the participants at the beginning of the study from their experiences with their own cotton bedding, prior to the Treatment Phase. "Week 4" results depict assessments of the athletes after using the DermaTherapy® bedding for 4 weeks.

STUDY RESULTS

Assessment of Current Cotton Bedding at Baseline



Assessment of DermaTherapy® Bedding After Four Weeks



CONCLUSIONS

In this study involving highly-active athletes, significant improvements were reported in their rest, recovery, and quality of life after only four weeks of using DermaTherapy® bedding.

In comparison with their current cotton bedding, study participants using DermaTherapy® bedding noted significant improvements in their sleep, overall temperature/moisture management, and improvements in perceptions of the impact of the bedding on their respective athletic performances – all important parameters associated with an athlete's ability to rest and recover during training periods.

Improvements¹ were reported in the following parameters:

Study Parameters	Cotton Bedding	DermaTherapy® Bedding
• Ability to get to sleep	23%	61%
• Amount of uninterrupted sleep	12%	56%
• Ability to keep cool	17%	95%
• Ability to move freely in bed	28%	89%
• Ability to keep dry	17%	82%
• Amount of sweating	17%	89%
• Effect on performance	11%	45%
• Improved comfort	28%	84%
• Overall assessment	22%	89%

¹ Percentage improvements expressed above were perceptions of "Some Improvement" and "Significant Improvement" by study participants.

What do you like best about your current bedding?

- Easy to clean
- Not uncomfortable
- Comfort & warmth.
- It's soft and thick so it doesn't wrinkle quickly.
- I like the color and feel of my cotton sheets.
- What I like best about my current bedding is the fact that it is thin because I am a warm bodied person. I tend to get hot very easily in the middle of the night, therefore, thin is good to limit the level of body temp during the night. Other than that, very standard simple bedding
- It looks ok and is comfortable as long as I'm not too hot.
- Seem fine. We really have nothing to compare them to.
- Light weight
- Nothing in particular.
- Cool temp upon entering the bed...
- The cotton is soft, especially immediately after washing.
- Cotton - soft, not stiff or slick.
- I have never considered previously consider this question. I guess I like pillow cases and sheets that feel soft but don't cause me to overheat and sweat at night.
- Softness. I generally try to have a high thread count.
- Nothing overall to note; perhaps in cooler months, helps with warmth factor.
- Appearance
- We have very high thread count sheets and they feel very soft and thick, which is probably why you will understand the next answer.
- Comfort, feel, degree of insulation
- Comfortable, I've really never slept on anything else.
- Soft
- First of all, Jeff Dengate asked me to test the sheets for him- I'm one of his shoe and gear testers at Rodale/Runner's World. Secondly, what I like best about cotton sheets and pillow cases is their softness - and that they start cool, but then warm up (which is not as ideal in the summer as it is in the winter).
- I like that it's comfortable to the touch and keeps me relatively cool during the summer.

What do you like least about your current bedding?

- I don't think they are the best for comfort. I am either too warm or too cool.
- Sometimes get cold
- Irritates my skin.
- Nothing.
- The cotton stays somewhat wet after a bout of night sweats
- What I like least about my bedding is it usually makes me over heat in the night. I tend to get hot if I have more than more simply sheet layer over me. I hardly ever use a comforter. Also, my pillow cases tend to get dirty very quickly for some reason. After about a week, my pillow case tends to feel not as comfortable and needs washing
- Everything is too hot
- It's not bad. I haven't ever felt like I have to go out and replace this bedding
- I find that I sweat pretty easily with this if warm night.
- Nothing in particular; maybe not as consistently soft as I would like
- Temperature regulation

- They do not stay dry and they induce sweat, particularly after training or a long day spent in the sun. They also absorb odors.
- Tends to bunch up -- feels hot when I wake up from hot flash.
- Sometime, I am kicking off the covers because I feel too warm during the night
- Temperature regulation is difficult.
- Rough feel of sheets and some sweating
- Feels flimsy. Haven't thought about it much
- I was getting horrible night sweats during a big training block or after a long endurance race, and, no...I'm not pre-menopausal!
- No real complaints
- They come untucked.
- Hot
- It can bunch in the middle of the night, creating an uncomfortable "mound" of fabric.
- It's not very good for keeping warm during the winter.

Overall comments about your current bedding?

- They are pretty well worn from washing and not a very high level of cotton.
- Mediocre at best
- Good but not great.
- I like thread count sheets of 800+ because of the strength of the sheet. it is more durable and doesn't get wrinkled easily, like other thinner sheets.
- Cotton sheets look nice, but tend to draw moisture away from the skin which leaves me with dry skin
- It may not be related to my bedding, however, getting hot in the night, I wake up at least three times a night on average. Sometimes even more.
- I do not know if it truly is the bedding, but my sleep is not as solid as I feel it should be.
- We really have nothing to compare our current to so we don't know anything that would be better or worse on the market.
- This is OK but nothing special. Does not help my rest or performance to speak of.
- There must be something better, more durable, and reasonably priced.
- I have always just gone with whatever someone else picks for me. I'm excited to try something new.
- I consider my bedding to be average. In cool conditions, it is quite comfortable. However, in the summer months or after training I tend to sweat which disrupts my sleep and can lead to skin irritation.
- Indifferent. Not particularly happy or unhappy either way.
- I never had something to compare with my existing bedding. I just accepted that it was adequately doing the job. Thinking about it now, I guess this is part of the reason that I toss and turn during the night and kick off the covers.
- With higher thread counts, cotton sheets aren't too bad but I wouldn't say I was completely satisfied.
- Again, nothing noteworthy, except that cotton sheets tend to feel rough, and since there is no "sweat management" there is a general sense of discomfort with that. Not sure about the overall effect on performance.
- Lukewarm
- I like to sleep with the room really cold at night, which is why I thought the nice, thick, cotton sheets were great. However, they were actually doing more harm including causing my skin to break out.
- Generally very satisfied
- I really do not think much about it.
- Overall not bad. I'm so tired at night that I pass out. But getting up is hard
- Cotton sheets and pillowcases are fine - they're the vanilla of bedclothes - no one really finds them objectionable, but no one really loves them.
- It's okay, not great, I suppose. To be honest, I never really put that much thought into it since cotton sheets seemed like the only option.

Is sleep important to your recovery?

- VERY much so. Rest is a big key for me. I think more so as I have aged. If I am doing hard workouts I can feel that I need more hours of sleep. And leading up to an event I know that restful nights of sleep pays off more than all the hard workouts.
- Sleep is the most important recovery process in life, no one performs at their highest level when getting insufficient sleep.
- Extremely important.
- Very important, like the #1 most important item. Sleep helps aid recovery, Also as a full time employee at Bank of America, i need enough sleep to function successfully at work and to perform at the highest level possible physically.
- Sleep recovery is very important because sleeps allows the muscles to de-fatigue and repair themselves overnight. Allows muscle fibers to regenerate and re-energize themselves.
- Sleep is very important, as I work at a full time job and train on top of that, there is little sleep in my life. Therefore, when I am sleeping, it needs to be deep and effective sleep to aid in my recovery. Sleep is important to aid in recovery so I can have the energy to train on top of a very busy schedule.
- Very much so. The body heals itself during sleep. Less sleep is less healing, both physically and mentally.
- Good sleep is always excellent for recovery of fatigued muscles and the ability to bounce back for another hard/tough work out. If your sleep/recovery isn't good your workouts are going to suffer.
- Critical particularly if I want to do a longer endurance activity.
- HUGE!
- Sleep recovery is paramount to success. After hard workouts, you can eat and drink all the new recovery products you want, and wear the most technological apparel you can get your hands on; but if you don't get adequate rest - you aren't going to properly recover for your next training session or race.
- It is essential. My athletic performance and overall energy markedly decline when my sleep is interrupted. I notice diminished endurance and loss of strength when I don't have adequate sleep recovery.
- Very. Even if performance during long run does not appear to be impacted how I feel the remainder of the day - how well I recover is definitely different if I do not sleep well the night before the run.
- As a runner, sleep is very important to me. This is the time where my body is recovering and rebuilding from the previous day's work out. If I am waking during the night, I am definitely not getting a solid night's sleep. This means, I am probably not achieving the right amount of rest that I should be getting.
- Very important. I would consider sleep as important as adequate nutrition-especially after difficult training or race conditions.
- Absolutely essential. I am also a fitness trainer and work many hours. If I do not get quality sleep, I am not at my best personally or professionally.
- Wake frequently. Sleep non restorative. Performance waning
- Sleep is very important (although severely lacking in my repertoire) because it enables tissue to repair faster and make actual gains from the hardcore training completed.
- Extremely. Uninterrupted time for healing without physical stress is incredibly important. Also being unconscious of pain for hours at a time is vital.
- Good sleep is key in giving your body the time it needs to recover. Without good sleep you do not recover and are therefore at a disadvantage.
- TONS!
- Obviously, sleep recovery is of the utmost importance to athletes - studies have shown that athletes need, on average, an extra minute of sleep each night for each mile that they run that week. So I need 50+ extra minutes of sleep each night - no small task when you consider that I have two children under the age of 5.
- Sleep recovery is extremely important. I feel extra aches and pains in my legs as a runner when I don't get enough sleep. Also, I feel "flat" and not as fast.

What do you like best about DermaTherapy bedding?

- Comfort and Coolness.
- Temperature regulation...never get hot OR cold.
- The feel of the bedding felt great against my skin. I used to use a high cotton count and this was definitely softer than my 700 count.
- Much Cooler and very Comfortable
- Comfort, coolness, quick drying, soft fabric, durable
- I really like the feeling of the sheets. Even fully covered I do not get hot. Almost like if I lay still for long period of time the sheets keep my body cool.
- The feel is great, never hot or cold
- The sheets were really nice and cool, and they made moving around in the bed easier.
- Material felt really "clean" and crisp. Especially as cotton always feels a lot less clean after a few days of usage. This too, seemed to lend it to creating less friction and allowed for free movement.
- I woke up less often during the night. Uninterrupted sleep is HUGE.
- I liked the smooth feel to the sheets. There was none of the usual catching on the skin. I also like the pillows cases which had the matching smoothness and seemed to keep my head feeling cooler at night.
- Nothing
- They feel nice and cool, but not cold, to sleep in.
- I liked the feeling of the fabric on my skin....and they do seem really cool when you first lie on the sheets when you get in bed.
- Seemed to help keep me cool so I didn't wake up overheated.
- This seems like a light weight and very comfortable material. The feel is very nice.
- I love the way the pillowcases feel on my face, and the sheets feel on my legs. I used to sleep in pants because I don't like the sheets sticking to me, and now I am sleeping in shorts again.
- Coolness. Always felt clean and fresh.

What do you like least about DermaTherapy bedding?

- I can't really think of anything I don't like.
- The "slickness" takes some getting used to, but it feels great. The sheets tend to move around a bit if they come untucked.
- The blanket literally slides off during the night. I know it would be hard to make one side more tacky, but if you could it would significantly help keep the blanket on the bed.
- I did not notice any change in skin dryness
- Slippery
- Honestly, nothing. These are the best bedding I have ever owned.
- I go to bed to early now.
- On chilly nights, the sheets made it seem even colder.
- Just had to get used to the material; am used to the feel of cotton.
- Nothing really, out preformed old sheets in every category, even ease of putting them on the bed.
- The sheets did feel a cool at least for the first 10 minutes or so each night.
- Too slick/covers above it sliding all over the place my wife thought she was more sweaty and hotter
- At first the sheets felt "plasticky", but after a few nights they seemed more normal.
- I don't like how "slippery" it is. My comforter would slide off every night because of it.
- Felt more like polyester than natural fabric.
- While I sweat somewhat less, I may still sweat on a day I do longer workout even with this bedding.
- I love it.

- At first I did not like how slippery they were but got used to it quickly.

Overall comments about DermaTherapy bedding?

- First of all, the packaging is awesome. I know that packaging doesn't mean much after you get it out of the box, but opening the case was like getting the sheet version of an iPhone. The first thing I noticed was the generous sizing. I have a King Sized mattress that is fairly thick. One of my big complaints with sheets (even expensive ones) is that the fitted sheet is too small. I imagine the manufacturers save an inch of fabric but it makes my experience miserable because the fitted sheet comes off ALL THE TIME. Your sheets have so much extra that I can't imagine them coming off. The sheets are extremely comfortable and allow for great movement. I love a cool bed and these sheets deliver. Thanks for the opportunity to test!
- Awesome feel, great temperature regulation. No waking up sweaty!
- I definitely did not have many night sweats/hot flashes while using the DermaTherapy sheets. I felt comfortable lying down and I believe it helped ease morning stiffness/soreness from intense training.
- Very Comfy and cool!
- I am very happy to have these sheets on my bed. I will continue to use these sheets and only these sheets in the future.
- This is truly great material and I don't know the cost but it has to be worth it. It's just better than cotton.
- I feel like the sheets did help with dryness, but they lacked somewhat in comfort. I would have liked them to have been softer.
- Liked the bedding. It makes me NOT want to go back to using cotton.
- Awesome, out preformed other sheets in every category. Anything that increases sleep quality is great.
- I liked the silky feel to the sheets as opposed to my normal cotton sheets, and I will continue to use them.
- Trying this with a university athletic program might be good, but personally I see no benefits
- The sheets don't feel like "athletic" material, but they do feel different than cotton sheets - which does throw things off the first night or two, but is easy to get used to.
- I sleep great in general, and typically get 8+ hours a night. I'm sometimes a bed sweater, and found that I sweat the same amount with these sheets. I don't think it had an overall effect on my athletic performance. Since I get a good night sleep every night, maybe I'm just special.. :) While they did feel cool when you first climb into bed, I didn't notice any cooling effect when I was sleeping throughout the night.
- A good product for anyone who doesn't mind the synthetic feel.
- I really do not have issues with sleep or my skin that bother me. So while I found the bedding comfortable, I cannot say the change in my sleep or recovery was significant.
- During heavy training or following an "epic" race of 30+ hours or more, I would sweat for about a week afterwards during the night. This summer and fall post two such races, I didn't have this issue.
- I like them -- and while I can't provide specific significant improvements/changes I like the sheets and feel like I did sleep somewhat better with them

Comments about rest and recovery with DermaTherapy?

- The one big improvement that I can tell is that I seem to be sleeping for longer periods of time uninterrupted. I'm not sure I can attribute that all to the sheets because there are so many variable with sleep, but since getting the sheets I can definitely say that I have some measurable improvement in comfort and length of sleep.
- Somewhat...I STAY asleep more...less waking up during the night. I am waking up feeling more rested.
- I feel as if I am indeed sleeping more deeply and not waking up as much in the middle of the night. The sheets seemed to help minimize DOMS and other overtraining effects.
- I'm always tired and don't have trouble falling asleep but I did notice they were much cooler and that made the humid night better!
- I have not been training hard during this test trial. However, I have been recovering from surgery and have found the smooth fabric and coolness to be soothing and invigorating.
- I have been able to sleep deeper. There is not as much waking in the middle of the night, especially for body temp issues. Therefore, these will help my training in the long run. Thank you!

- As far as the importance of better sleep, there is no question it makes a difference. I think getting a good rest is the most important thing as you get older. You can train well and hard but if you do not sleep well leading up to an event, you are just done for. After trying these sheets, I would not think twice about buying them.
- No, not really. I've had them on the bed for a couple weeks and, honestly, my sleep recovery has been about the same with these sheets as it was with regular sheets.
- I usually wake up 5 times a night, with these sheets I only woke up 3 times per night. Uninterrupted sleep is key to recovery and these sheets allowed me to sleep longer stretches during the night.
- Yes, usually at night, I toss and turn a lot which tends to wake me up at night. With these sheets, I was doing less of this so I was sleeping for longer periods and feeling more rested upon waking.
- No
- I ran a PR in a 5K and in a half marathon while sleeping on DermaTherapy sheets. Not sure they helped, but they didn't hurt!
- I have not seen a difference in my sleep recovery. See answer above.
- No, can't say that I have.
- Not really
- Usually, I have to read for a long time before I can fall asleep. Now, I get into bed and have an "aaaahhh" sensation. I fall asleep much faster and don't wake up to use the restroom in the middle of the night.
- Not a significant change.