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Doug Barnard, a chiropractor and competitive cross-country skier from Oregon, called me out-of-the-blue. Dr. Barnard was about to undergo a knee replacement surgery and wanted to know if KAATSU would help.

I explained to him that not only would KAATSU help in his rehabilitation, but that benefits can come with KAATSU as a form of prehab. Dr. Barnard had read about KAATSU, attended a KAATSU Seminar at a Biohacking Conference, and was ready to start.

Committed to both prehab and rehab, Dr. Barnard experienced results that were unheard of. And so he became a Master KAATSU Specialist and has been sharing his own personal experiences with his own patients and others who he has met at conferences, conventions and seminars.

Dr. Barnard is always striving to achieve the KAATSU Smile, a response when a patient feels relief and realizes their recovery is proceeding faster and better than normal.

From coast to coast in America, Dr. Barnard has used KAATSU in a wide variety of applications on people ranging from aging Baby Boomers to amateur skiers.

From his base in Oregon, he loves to share his own means of rehabilitation and recovery to others. He explains how KAATSU can be used in everyone’s wellness continuum.

KAATSU can be used differently by weekend warriors and competitive athletes throughout their offseason, pre-season, mid-season and championship seasons and by white-collar employees who range from long periods of healthfulness to an occasional injury.

Like Dr. Barnard, the employees of KAATSU Global and KAATSU Specialists around the world in 32 countries thoroughly enjoy teaching KAATSU protocols and applications to people of all ages, abilities and backgrounds.

This digital magazine is one means of sharing this information and various stories and experiences of KAATSU users with many others.

Thank you very much for your interest and support.

Steven Munatones, CEO & Co-founder
KAATSU Global, Inc.
Huntington Beach, California, U.S.A.
After 1-2 KAATSU Cycles (Cycle 20 is a great warmup for non-athletes or Cycle 60 for high-level athletes) and perhaps after completing the standard KAATSU 3-point exercises (i.e., hand clenches + biceps curls + triceps extensions), try to do the KAATSU Push-up Challenge (i.e., three sets of push-ups with your Optimal SKU levels in the KAATSU Air Bands).

Do the first set of push-ups until you reach muscular or technical failure. Ideally, your Optimal SKU will allow you to do between 25-40 push-ups.

Then rest 20 seconds and start your second set of push-ups. Do the second set of push-ups until you reach muscular or technical failure.

Ideally, if your Optimal SKU is set properly, you will not be able to repeat the same number of push-ups in the second set as you did in the first set. You may be able to do only 10-20 push-ups on the second set. This is OK and actually exactly what you want.

Then rest 20 seconds and start your third set of push-ups. Do the third set of push-ups until you reach muscular or technical failure.

Ideally, your number of push-ups will decrease again. This indicates you have set your Optimal SKU.

This is a great way to build strength and develop tone in your upper body.
Sprint butterfly + pull-ups + pull-outs + push-ups with the pneumatic KAATSU Aqua Bands are notoriously difficult. 8 x 25 with 5 pull-ups and 10 push-ups are extraordinarily tough.

Aquatic athletes can pull a parachute with KAATSU Aqua Bands to enhance speed, stamina, strength and “feel” in the water.

Competitive swimmers, open water swimmers, water polo players, triathletes, surfers, and other watermen and waterwomen can use KAATSU Aqua leg bands to enhance speed, stamina, strength and “feel” in the water.

Using the pneumatic KAATSU Aqua Bands by identifying the appropriate Base SKU (compression) and inflated Optimal SKU (compression), swimmers, water polo players and triathletes and everyone from those rehabilitating to individuals simply focused on fitness can really work on their core in the water.

Long Beach (California) firefighter Mitch Berro trains with KAATSU Aqua Bands by pushing off bottom of pool holding a weight.

Training with KAATSU Aqua Bands by eggbeatering in a pool while holding a weight.
Training With KAATSU AQUA BANDS In Water

Use a kickboard, use fins, do vertical kicking, or other moves to highly stress the legs and core.

The pneumatic KAATSU Aqua Bands add stress to sculling in the water with or without hand paddles.

The pneumatic KAATSU Aqua Bands can help strengthen triceps with triceps extensions in the water with or without hand paddles.

The pneumatic KAATSU Aqua Bands can be done while swimming, kicking or pulling butterfly, backstroke, breaststroke or freestyle, or while shooting a water polo ball or doing aqua-therapy, aqua-walking or aqua-jogging.

Pull along a parachute to add stress to your KAATSU Swimming.

KAATSU Aqua Walking for those undergoing aqua-therapy or rehabilitation.
World championship bronze medalist and two-time NCAA wrestling champion Andre Metzger describes how KAATSU helps his collegiate wrestlers make weight before their bouts.

Metzger uses a KAATSU Nano and KAATSU Air Bands on his wrestlers’ arms and legs (separately) with the appropriate Base SKU (compression) and Optimal SKU (compression).
How Do You Find Optimal KAATSU Pressure?

Identifying the appropriate KAATSU pressure (measured in SKU or Standard KAATSU Units) is a combination of the following:

**Level 1:** Selecting the appropriate KAATSU Air Band size: small, medium or large

**Level 2:** Selecting the appropriate Base SKU or manually tightening of the KAATSU Air Bands

**Level 3:** Identifying the appropriate Optimal SKU or inflating the KAATSU Air Bands
How Do You Find Optimal KAATSU Pressure?

The Base SKU is the pressure after manually tightening the KAATSU Air Bands on the upper arms or upper legs. The pressure in SKU can be manually adjusted by either tightening or loosening the bands as appropriate.

LEVEL ONE:
The KAATSU Air Bands are available in 3 sizes: Small, Medium and Large.

The KAATSU Specialist should measure the circumference of the top of the arm (right under your armpit) and the circumference of the top of the leg (right alongside the groin). Those circumferences will determine the appropriate size for the KAATSU Air Bands.

ARMS
Small: 18 〜 28 cm (7.06 〜 11.02 inches)
Medium: 28 〜 38 cm (11.02 〜 14.96 inches)
Large: 38 〜 48 cm (14.96 〜 18.89 inches)

LEGS
Small: 40 〜 50 cm (15.74 〜 19.68 inches)
Medium: 50 〜 60 cm (19.68 〜 23.62 inches)
Large: 60 〜 70 cm (23.62 〜 27.55 inches)

If the KAATSU user exceeds 48 cm in circumference on their upper arms or 70 cm in circumference on their upper legs, then special order (“sumo size”) KAATSU Air Bands are recommended.

LEVEL TWO:
After millions of KAATSU sessions in Japan, these are the basic guidelines for the Base SKU primarily based on age and general physical fitness. Of course, there are always individual exceptions, but these guidelines have proven safe and effective over the decades and among hundreds of thousands of users of all ages, abilities and physical abilities:

The Base SKU is the pressure after manually tightening the KAATSU Air Bands on the upper arms or upper legs. The pressure in SKU can be manually adjusted by either tightening or loosening the bands as appropriate.

There should be no numbness or whiteness in the limbs at all. Numbness may result in an inappropriate placing of the Air Bands where the bands may be pressuring against a nerve. Whiteness or an unnatural paleness in the limbs is due to occluding or cutting off the arterial flow - and this should be avoided at all times.

Recommended Base SKU for Arms on the KAATSU Master:
• 10-20 SKU for older and middle age adults with less-than-average level of fitness
• 20-30 SKU for older and middle age adults with an average level of fitness
• 30-40 SKU for young and middle age adults with a good level of fitness
• 40-50 SKU for teenagers, young adults and adults with a high level of fitness
• 50+ SKU for elite athletes or those with extraordinarily high levels of fitness

Recommended Base SKU for Legs on the KAATSU Master:
• 20-30 SKU for older and middle age adults with less-than-average level of fitness
• 30-40 SKU for older and middle age adults with an average level of fitness
• 40-50 SKU for teenagers, young adults and adults with a high level of fitness
• 50-60 SKU for elite athletes or those with extraordinarily high levels of fitness
How Do You Find Optimal KAATSU Pressure?

Recommended Base SKU for Arms on the KAATSU Nano:
- Less than 10 SKU for older and middle age adults with less-than-average level of fitness
- 10-15 SKU for older and middle age adults with an average level of fitness
- 15-20 SKU for young and middle age adults with a good level of fitness
- 20-25 SKU for teenagers, young adults and adults with a high level of fitness
- 25+ SKU for elite athletes or those with extraordinarily high levels of fitness

Recommended Base SKU for Legs on the KAATSU Nano:
- 10-15 SKU for older and middle age adults with less-than-average level of fitness
- 15-20 SKU for older and middle age adults with an average level of fitness
- 20-25 SKU for teenagers, young adults and adults with a high level of fitness
- 25-30 SKU for elite athletes or those with extraordinarily high levels of fitness

The recommended Base SKUs on the KAATSU Master and KAATSU Nano are different because the size of the compressors in each of these units.

A “KAATSU Color” should result when the appropriate Base SKU is applied. That is, a pinkness or rosiness in most individuals or a beefy redness for active adults or athletes will result in the palms of the hands or quadriceps on the legs.

LEVEL THREE:
After the Base SKU is applied by manually tightening the KAATSU Air Bands, the bands are gradually inflated to the Optimal SKU.

This process will take 5-10 minutes to do properly and may take 2-3 sessions to get precisely right.

On the arms, start inflating the bands to a level of 100 SKU. On the legs, start inflating the bands to a level of 150 SKU. Ask the user if (1) they are comfortable, (2) they feel any numbness, and (3) they can feel their pulsation under the bands while the KAATSU Specialist checks their Capillary Refill Time.

If the user is comfortable and without numbness, check their Capillary Refill by firmly pressing your thumb into the palm of their hands or their quadriceps muscle above their knee. Release and see how quickly the blanched (white) area returns to normal color. If this Capillary Refill Time is less than 3 seconds, this is safe. If this Capillary Refill Time is more than 3 seconds, then the Air Bands are inflated too tightly and should be immediately released.

The KAATSU Specialist asks the user if they can feel any pulsation under the bands. If the user cannot feel any pulsation, release the pressure and increase the SKU by 10 SKU for the arms and by 20 SKU for the legs.

At the increased SKU pressure (e.g., 110 SKU on the arms or 120 SKU on the legs), the KAATSU Specialist repeats this process and questioning: (1) Are you comfortable? (2) Do you feel any numbness? (3) Do you feel a pulsation under the bands?

The user may or may not feel any pulsation under the bands at low pressures. In that case, the KAATSU Specialist continues to increase the SKU pressure by increments of 10 SKU in the arms and 20 SKU in the legs.

This process continues until the user feels a strong pulsation under the bands. At the point where the pulsation begins to feel weaker, then the bands have been inflated too much. That is, if there is a strong sense of pulsation at 200 SKU, but there is a less strong sense of pulsation at 210 SKU, then the appropriate SKU pressure is 200 SKU.
To confirm that this initial Optimal SKU pressure is appropriate, do a series of KAATSU 3-point Exercises for both the arms and legs. The KAATSU 3-point Exercises for the arms involves 3 sets of hand clenches, bicep curls and tricep extensions. The KAATSU 3-point Exercises for the legs involves toe curls, toe raises, and heel raises (or for more fit individuals, heel raises, leg curls and squats).

During the 3 sets of these exercises, the KAATSU Specialist asks the user to do a set of 25-30 repetitions of each exercise (hand clenches, bicep curls and tricep extensions or heel raises, leg curls and squats).

If the user can do 3 sets of 25-30 repetitions of each exercise without going to failure, then the Optimal SKU pressure is too low. However, if the user can only do a decreasing amount of repetitions of each exercise before going to failure, then the Optimal SKU pressure is appropriate.

For example, if the user can only do 30 bicep curls on the first set, 22 repetitions on the second set, and only 15 repetitions on the third set before becoming fatigued, then the Base SKU and Optimal SKU pressures are appropriate.

Individuals of all ages and abilities will find that they will be able to accommodate, acclimate and adapt to increasing Optimal SKU pressures rather quickly between their first KAATSU and subsequent KAATSU sessions.

Regarding age, the highest pressures generally occur between ages 20-30 and decrease for younger and older individuals. Dr Jim Stray-Gundersen, the Chief Medical Officer of KAATSU Global, explains, “There is an overlay of ‘physiologic’ age that modifies the chronological age. That is, with the elderly who may have stiff, damaged arteries, use relatively low pressures.”

Regarding relative fitness, the fitter the subject is, the higher the optimal pressure from the same base pressure will be.

Regarding limb circumference/cross sectional area, the bigger the extremity is, the higher the pressure will be. So arm pressures are typically 50-100 SKUs lower than leg pressures. Also, if an individual has more muscle versus fat in the extremity, they will generally be able to handle higher pressures.

As Dr Stray-Gundersen recommends, “Keep in mind what one is trying to do with KAATSU is find the optimal amount of venous outflow impediment so that otherwise easy exercises become unsustainable.”
There are 3 basic levels of KAATSU:
Level 1: KAATSU Cycle
Level 2: KAATSU 3-point Exercises
Level 3: KAATSU Performance

LEVEL ONE:
The KAATSU Cycle is a convenient form of blood flow moderation activity that requires no physical movement. It can be done anywhere (e.g., office cubicles, airplane seats, sofas at home, desks at school) anytime (e.g., before or after workouts), on the arms and separately on the legs. Of course, physical movement during KAATSU Cycle can be done if desired.

During KAATSU Cycle, the KAATSU Air Bands remain connected to the KAATSU Master, KAATSU Nano or KAATSU Cycle units.

The full KAATSU Cycle on the KAATSU Master and KAATSU Nano is a 3 minute 20 second session and can be repeated as desired with an SKU pressure as appropriate for each individual. During the KAATSU Cycle the pressures in the arm and leg bands increases incrementally on each of the 8 cycles. So if the SKU pressure is inputted as 200 SKU on the arms, the 8 cycles are 130-140-150-160-170-180-190-200 in SKU pressure.

In contrast in the specialized KAATSU Cycle unit, there are 3 different levels of cycling at specific SKU pressures:

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Duration</th>
<th>SKU Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYCLE 20</td>
<td>3 min 20 sec</td>
<td>100 SKU</td>
</tr>
<tr>
<td>CYCLE 40</td>
<td>6 min 40 sec</td>
<td>150 SKU</td>
</tr>
<tr>
<td>CYCLE 60</td>
<td>10 min 40 sec</td>
<td>200 SKU</td>
</tr>
</tbody>
</table>

The entire CYCLE 20 session is 3 minutes 20 seconds in duration and can be repeated as desired.

CYCLE 40 is 40 seconds of 150 SKU in pressure followed by 10 seconds without pressure. The entire CYCLE 40 session is 6 minutes 40 seconds in duration and can be repeated as desired.

CYCLE 60 is 60 seconds of 200 SKU in pressure followed by 20 seconds without pressure. It is 10 minutes 40 seconds in duration and can be repeated as desired.

KAATSU Cycle helps relieve stress and results in an elevated energy levels. It can be done in confirm spaces (office cubicles or on a train) and done with or without movement.
LEVEL TWO:
The KAATSU 3-point Exercises are a highly-efficient form of blood flow moderation exercise for both the arms and legs. It can be done anywhere anytime and involves 3 sets of hand clenches, bicep curls and tricep extensions on the arms, and toe curls, toe raises, and heel raises on the legs.

Individuals of all ages and abilities can go to muscle exhaustion within minutes without use of weights.

The SKU pressures used during the KAATSU 3-point Exercises are dependent upon the appropriate Base SKU and Optimal SKU pressures.

After millions of KAATSU sessions in Japan, these are the basic guidelines for the Base SKU primarily based on age and general physical fitness. Of course, there are always individual exceptions, but these guidelines have proven safe and effective over the decades and among hundreds of thousands of users of all ages, abilities and physical abilities:

**Base SKU for Arms on the KAATSU Master:**
10-20 SKU for older and middle age adults with less-than-average level of fitness
20-30 SKU for older and middle age adults with an average level of fitness
30-40 SKU for young and middle age adults with a good level of fitness
40-50 SKU for teenagers, young adults and adults with a high level of fitness
50+ SKU for elite athletes or those with extraordinarily high levels of fitness

**Base SKU for Legs on the KAATSU Master:**
20-30 SKU for older and middle age adults with less-than-average level of fitness
30-40 SKU for older and middle age adults with an average level of fitness
40-50 SKU for teenagers, young adults and adults with a high level of fitness
50-60 SKU for elite athletes or those with extraordinarily high levels of fitness

**Base SKU for Arms on the KAATSU Nano:**
Less than 10 SKU for older and middle age adults with less-than-average level of fitness
10-15 SKU for older and middle age adults with an average level of fitness
15-20 SKU for young and middle age adults with a good level of fitness
20-25 SKU for teenagers, young adults and adults with a high level of fitness
25+ SKU for elite athletes or those with extraordinarily high levels of fitness

**Base SKU for Legs on the KAATSU Nano:**
10-15 SKU for older and middle age adults with less-than-average level of fitness
15-20 SKU for older and middle age adults with an average level of fitness
20-25 SKU for teenagers, young adults and adults with a high level of fitness
25-30 SKU for elite athletes or those with extraordinarily high levels of fitness
LEVEL THREE:

KAATSU Performance is the most intense form of full body blood flow moderation exercise. It can be done anywhere anytime and involves a full range of movements used in physical therapy, resistance training, or sports specific activities including throwing, agility drills or running. Individuals of all ages and abilities, from beginners to professionals, can go to muscle exhaustion within minutes without use of weights or any resistance other than body weight.

In KAATSU Performance, individuals can do the movements of their choice as they overlay their exercise with KAATSU arm or leg bands on. Done properly, KAATSU Performance results in no soreness, immediate recovery, and elevated energy levels.

In summary, there are some important points to remember:

• The higher the Base SKU, the lower the Optimal SKU will be. It is the combination of the Base SKU and the Optimal SKU that is the critical pressure.

• There can and will be daily variations of up to +/- 20-30 SKU in the same individual.

• The anticipated Optimal Pressure is primarily a function of age, fitness and limb circumference.

Regarding age, the highest pressures generally occur between ages 20-30 and decrease for younger and older individuals. Dr Jim Stray-Gundersen, the Chief Medical Officer of KAATSU Global, explains, “There is an overlay of ‘physiologic’ age that modifies the chronological age. That is, with the elderly who may have stiff, damaged arteries, use relatively low pressures.”

Regarding relative fitness, the fitter the subject is, the higher the optimal pressure from the same base pressure will be.
FIRMING UP LEGS with KAATSU

Whether KAATSU female users are 26 or 66, many of them ask how best to tone their legs and hips with KAATSU.

In contrast to the more intense KAATSU workouts that focus on muscle hypertrophy or improvement of specific sports movements, KAATSU Walking with a lower pressure in the KAATSU Air Bands is highly recommended.

PREPARATION

- Be well-hydrated.
- Understand the standard KAATSU protocols (i.e., always have good capillary refill within 2-3 seconds, no occlusion, no numbness).
- Always warm-up with the KAATSU Cycle (i.e., 8 cycles of 20 seconds pressure on + 5 seconds pressure off).

KEY POINTS

- Can do KAATSU Walking daily, but it is recommended to do at least 2-3 times per week.
- Use a lower-than-normal Base SKU and a lower-than-normal Optimal SKU.
- The entire leg-focused workout can be 15 minutes in total.
- Do not release the air in the KAATSU Air Bands throughout the entire workout (unless, of course, you feel numbness or become lightheaded).

PROTOCOLS

- STEP 1: Start with the KAATSU Cycle at a lower-than-normal Base SKU and a lower-than-normal Optimal SKU to warm-up (e.g., if your Optimal SKU is normally 200 SKU, then use an Optimal SKU of 160).
- STEP 2: After the KAATSU Cycle is complete (you can do this once or twice), inflate the KAATSU Air Bands to a lower-than-normal Optimal SKU (e.g., if your Optimal SKU is normally 200 SKU, then use an Optimal SKU of 160).
- STEP 3: Walk for 15-20 minutes. Simply walk around your neighborhood, your fitness gym or wherever you are doing KAATSU. Alternatively, you can walk on a treadmill or use a StairMaster or other such indoor equipment.
- STEP 4: Top off your KAATSU session with some light stretching and do a KAATSU Cycle as a warm-down if you wish.

POST-WORKOUT RESULTS

- You will feel very toned and refreshed.
- Your legs will become slimmed and toned without muscle hypertrophy.

Photos show 66-year-old Diana Nyad doing some more intense and complicated KAATSU leg strengthening exercises with KAATSU Specialist Hollie Stray-Gundersen.
In Arizona during the 1990s, two-time High School Swimmer of the Year Misty Hyman started to put large rubber bands around her upper legs and upper arms under the guidance of her Hall of Fame coach Bob Gillette.

Gillette was innovative and came up with the idea of placing big, thick bands around Hyman’s arms and legs in order to restrict the blood flow to her extremities.

After Hyman entered Stanford as America’s most formidable high school star in 1997, she continued to use the rubber bands around her legs and arms during certain sets under the guidance of renowned Olympic coach Richard Quick.

A few of her teammates tried the bands around their legs, but Hyman remained a lone star in the revolutionary training modality. Combined with her innate talents and hard work, her training regimen worked as Hyman graduated from Stanford University with 9 NCAA titles to her credit.

Most famously, Hyman put all those years of training to good use when she pulled off one of the greatest upsets in aquatic history when she defeated Susie O’Neill at the 2000 Sydney Olympics. Defending Olympic champion Neill had not lost a 200-meter butterfly race in 6 years, but Hyman put it all together physically and mentally on swimming’s biggest stage in Sydney. When Hyman retired in 2004, the close of her career spelled the end of those thick rubber bands.
But a young American coach, Christopher Morgan, was also on the pool deck helping Quick mold Olympic champions and NCAA record-holders at Stanford. He watched Hyman go from a high school star to Olympic champion. But he always wondered about those rubber bands. Why wasn’t anyone using them? What exactly did the bands do physiologically? When the limbs are engorged in blood, what happens to the body?

Dial forward 18 years.

Hyman continues to be a role model for swimmers and people of all walks of life.

Gillette currently serves as a USA Swimming Master Coach while Quick sadly passed away in 2009. Morgan found his own path to Olympics as coach of the Swiss team as well as a coaching stint at Harvard University.

While at Harvard, Morgan met an innovative Japanese doctor who had independently developed blood flow moderation exercise in the 1960s. “Dr. Sato created KAATSU which means ‘additional pressure’. It has been used by hundreds of thousands of Japanese for sports performance, fitness, and rehabilitation over the last several decades. When I first saw Dr. Sato’s sophisticated pneumatic KAATSU bands with sensors inside, it reminded me of Misty’s rubber bands. It was déjà vu in the pool with a highly sophisticated Japanese technological twist.”

Dr. Peter Lansbury, a former Princeton swimmer and currently a professor of neurology at the Harvard Medical School has been using KAATSU bands for several months. He explains, “Dr. Sato discovered the effects of blood flow restricted exercise that he calls KAATSU.

He has shown remarkable results with Japanese Olympic medalists and pro athletes and is now working with the Chinese Olympic Committee. Fortunately, he also shared his knowledge with our colleagues here at the Harvard Medical School. But Chris has really run with KAATSU’s applications with his age-group swimmers at Northshore YMCA.”

Morgan describes his pioneering KAATSU training with three young swimmers on his team.

“Carson Christuk is a 16-year-old breaststroker. He has been using KAATSU Aqua 3 times per week after breaking his wrist and dislocating his kneecap during 2013. He says KAATSU has helped reduce and occasionally eliminate the lingering pain of his injuries. But it is the improvement in his best times that have been most satisfying. He was a 2:14 200 breaststroker in September 2013 and then dropped his time to 2:11 with a taper in December. After starting KAATSU in January, he pulled a 2:09 in February and then ripped off a 2:03 in April at the YMCA National Championships.

Jake Bennett is an 18-year-old freestyler. He had a bad rotator cuff injury since the summer of 2013. It would flare up under high stress or due to high volume. Initially, he used KAATSU every day for 2 weeks to see any improvement. During the first week, he only used the KAATSU Aqua bands on his legs, but then he started up with his arms on week 2. After 2 weeks, his pain was almost gone for the first time in 3 months. Like Carson, his performances skyrocketed. He was a 1:44.9 200 freestyler in September 2013 and did a 1:46.5 in October while he was in pain. But after starting KAATSU in November, he dropped to 1:44.5 in December and just did a 1:41.2 swimming pain free at the high school state championships.”

Morgan has also used KAATSU with four of his disabled swimmers including 3 Para-National Team swimmers and 1 world record holder. “The Japanese use KAATSU Aqua bands with individuals who are missing limbs or who have had strokes. We place the KAATSU bands on both limbs of our disabled athletes while we carefully identify and monitor the pressure.”
While it may look like simple bands on the arms and legs, there is a specific protocol that Dr. Sato developed. Like the American Olympic skiers and jumpers who use KAATSU, and the professional athletes in Japan, we look for a certain physiological state and then we work with our swimmers over intense, short periods with some pretty remarkable results."

Dr. Jim Stray-Gundersen oversees KAATSU training with the U.S. Ski and Snowboard Association athletes where all the skiers and snowboarders incorporate KAATSU into their training regimen. The Sports Science Advisor explains how he has applied KAATSU at the Center of Excellence in Park City, Utah.

“When we have injured athletes, they can do both KAATSU and Alter-G in order to maintain their strength and aerobic conditioning as they recover. We are also starting to incorporate KAATSU training into the regime of our uninjured athletes. KAATSU allows safe (very light weights), maximal workouts to failure in short periods of time (about 15 minutes), with positive results coming in as little as 10 sessions.”

What Bob Gillette and Misty Hyman were working on in the 1990’s may have been more profound that they may have initially realized.

“Consequently, as the tissue becomes more hypoxic and energy stores depleted, anaerobic glycolysis attempts to compensate by increasing its rate, which produces some ATP, but also produces a marked disturbance in muscle homeostasis that ultimately leads to muscle failure, or in other words, not being able to continue the exercises,” says Dr. Stray-Gundersen.

The effects that have been seen in combative sports (boxing, wrestling, judo), baseball, rugby, and numerous winter sports in Japan and China are now beginning to be understood by Morgan and others in the aquatic world.

Dr. Stray-Gundersen describes his perspective. “We think, but have yet to prove, that there is a “local” effect and a “systemic” effect from KAATSU training. When blood flow is restricted and muscle is asked to exercise with a restricted, engorged circulation, homeostasis is lost in the exercising tissues below the KAATSU belt. The development of hypoxia, acidosis and various other metabolites outside their normal concentrations, stimulates a positive adaptive response in the local muscle and vasculature.”
Increasing concentrations of Vascular Endothelial Growth Factors (VEGF), which has been shown experimentally, is an example of the "local" effect.

In addition, we think there is an important "systemic response", where the loss of homeostasis is communicated to the brain (KAATSU practitioners are aware of the discomfort in their muscles) and the brain responds by increasing breathing and heart rate, as well as initiating an "anabolic" cascade. The release of growth hormone from the pituitary, which has been shown experimentally, is an example of this "systemic" response. This has the effect of causing muscle both distal to the KAATSU belts and proximal to the belts to adapt and get stronger.

In essence, KAATSU presents a very effective and highly efficient mechanism that coaches and trainers can implement with their athletes to get increasing circulating levels of growth hormone and VEGF, that is otherwise difficult and very taxing to do."

Essentially back in the 1990s, Hyman had a secret weapon in her training regimen that was far ahead of her time. While her strength off the walls, technique, stamina, and mental outlook all came together at the Sydney Olympics, Hyman had been uniquely developing her vascular system over the years.

At the same time half a world away, KAATSU began gaining a foothold among athletes in Japan. Based on his own research and patented concepts and equipment, Dr. Sato began conducting medical and scientific research with the University of Tokyo Hospital and other researchers and physicians in Japan.

With a rapidly aging population, KAATSU started to gain adherents throughout Japanese society. KAATSU was even used with comatose patients and those with neurological diseases.

For every Japanese Olympic medalist who used KAATSU, there were many more individuals – from teenagers to their great-grandparents – who integrated the KAATSU in their fitness and rehabilitation programs. Last year, KAATSU has begun used by Chinese and American professional and Olympic athletes in various sports.

Its first use in the aquatics world in the U.S. was by Vanguard Aquatics in Huntington Beach, California. Coaches Uros Dzelebdzic and Sasa Branasavljevic have quickly developed one of the best age-group water polo programs in the country. They continue to refine KAATSU’s use with their age group and high school players.

Dzelebdzic summarized his first test, “KAATSU appears to be an effective short-term training method that improves performance significantly more than traditional high intensity training. Athletes who used KAATSU had almost a 4% increase in speed compared with athletes who did not use KAATSU.”

But like Gillette, Dzelebdzic may only be scratching the surface of KAATSU.

"Together with Dr. Sato, we established the Center for KAATSU Research at Harvard Medical School and the KAATSU Research Foundation,” says Professor Lansbury. “We base our research on the specific protocols for safe use that Dr. Sato discovered, researched, and confirmed over the past 40 years.

Each athlete uses different KAATSU pressures that are appropriate to them; the coach confirms this pressure before workout which can differ from day to day.

KAATSU can be used widely in various realms, from corporate wellness to the NFL. Besides exploring different medical and therapeutic possibilities of KAATSU, the sports performance possibilities for this technology are obvious based on the research and practical applications at all levels of Japanese sports and medicine.”

For more information, visit www.kaatsu-global.com.
Dr. Lyle Nalli was surprised when his hearing went out after he hopped out of workout one day.

"I just couldn't hear with my left ear," said the 53-year-old podiatrist from Huntington Beach, California. "I got out of the pool and thought there was water in my ear. It would not go away. I thought there was wax in the ear, but there was nothing."

I took a hearing test that showed a loss of hearing, but the doctors did not know why.

After consulting his colleagues in the medical community, he went in for an MRI. "It was positive for acoustic neuroma (AN), a swelling of the nerve," he recalls. The tumor was 3 mm in diameter and located inside his cranium between the inner ear and his brain stem.

"After consultation, there were 3 options: just observe and let it be, gamma knive, and a surgery to excise it. I decided on surgery at the House Ear Clinic in Los Angeles with Dr. Slattery who I cannot say enough positive things about."

He decided on an immediate surgery because he felt he was healthy enough to get through the surgery, there was no chance of coming back after excision, and he could eliminate the worry for the rest of his life that the tumor was not getting bigger.

For a man who has been training and racing all his life as a competitive pool and open water swimmer, health was not an issue. Not only has Dr. Nalli been a regular at local events, he has placed at World Masters Championships and was on a world record-setting Catalina Channel relay with his Long Beach Swim Focus teammates.

"The nurses and staff nicknamed me The Athlete because my resting heart rate was so low. In the Intensive Care Unit (ICU), my resting pulse of 38 beats per minute kept on tripping the alarm."

Like his open water swims, Dr. Nalli knew the inherent risks, but he had prepared himself as best he could and left the preparations and guidance up to Dr. Slattery.

"In surgery, he cut into my skull about the size of a quarter (24 mm) behind my ear. He drilled into my skull and then gave me a spinal tap and drained out the cerebral spinal fluid (CSF). This caused my brain to recede and gave the doctor some slack to work with. Then he made a cut to excise the tumor around the brain stem where the facial nerves, hearing nerves, and balance nerves are located. He cut out the balance nerves and then shaved off a bit of the hearing nerve in order to save my hearing. Six hours later, the benign, slow-growing tumor was out and he patched me all up."

Dr. Nalli's story now becomes one of inspiration and shows the advantages of staying in shape as one ages.
“I was in ICU for 3 days and then I stayed in the hospital for a week total. For the first day and a half, I went in and out of sleep. I had a throbbing headache and a sick, sour taste in my stomach for 4 days. It was hard to sleep and I had this strong sense of smell of cat urine and burnt eggs. This taste and smell did not go away for days and I immediately lost 15 pounds while I was in ICU. I lost my sense of balance and my head felt like it was spinning. I was tired and I could not figure out a way to walk or read or watch TV. Patience and time were what was needed. Even after 7 days, I was not able to walk upstairs and listening to music and reading was just tiring. I learned patience.”

Fortunately, his healthy body built up over the decades through swimming got about to start healing itself quickly. "I just go around waiting and watching. This was exactly the opposite from all my experiences in athletics and swimming. Imagine in swimming if a coach asked you to just do nothing in order to get better? But that is what I did."

But time means different things to different people. And Nalli was definitely different.

3 days in ICU, 7 days in the hospital, and on the 18th day after 6 hours of brain surgery, Dr. Nalli ventured back to the pool. He was weak and his muscles had atrophied. He started to use KAATSU to gain back muscle and recover to where he was before.

"After 2 weeks, Dr. Slattery was surprised at my recovery. I had to have help to walk and keep my balance. Once I got back in the pool, I was so elated to even kick. But I felt nauseous when I did a flip turn or even turned my head to breathe. I was very happy to be able to do 25 yards of freestyle, but I mostly did kicking. I was careful and couldn’t do flip turns and even breathing side to side was tough. But day by day, I got better and used a swim snorkel. I started out doing 500 yards, then 1100 yards, then 1800 yards.”

Remarkably, less than 4 weeks from his skull being cut open with a drill, Dr. Nalli had gradually upped his distance to 5000 yards and was regularly doing KAATSU - both on land and in the water.

"I just got in and decided to do a 500-yard swim. Once I was able to do that, I decided to do 1000 yards total [40 laps of a pool]. It is just progression. I am happy that I was healthy before the surgery. The wobbling is getting less intense and the dizziness is going away sooner.

I entered U.S. Masters Swimming Nationals less than a month and competed in the 400 individual medley and distance freestyle."

Dr. Nalli continued to do KAATSU every day during his recovery. He further augmented his physical therapy with KAATSU Aqua training on a near daily basis as part of his overall rehabilitation in a quest to return to his former swimming speed.

Some of his post-surgery workouts included using KAATSU Aqua Bands on his upper arms and upper legs in the pool, swimming 1-2 laps slowly while building up lactic acid that would normally result if he swam intensely. As his limbs become engorged in blood, he did KAATSU Aqua sets of 25 yards and 50 yards. He did anywhere from 200 - 800 yards in total distance with the KAATSU Aqua Bands as he reached failure when the lactic acid in his arms precluded him from swimming further - and served as a catalyst for a significant hormonal response.

Looking at his sparkling blue eyes and wide smile, his joy in swimming was clearly evident and a credit to his positive mindset and a long life of healthful living.
Warming Up And Warming Down With KAATSU

KAATSU is well-known to build muscle mass and girth. But this is only one single aspect, one athletic perspective, one possible benefit, one resultant outcome of KAATSU.

There are some athletic activities that need only a greater range of motion or increased strength or improved performance - and do not desire greater muscle mass or girth. Similarly, some individuals do not wish to gain muscle mass or muscle girth - they prefer improved muscle tone or improved BMI.

In these cases, the KAATSU Cycle is an ideal application of KAATSU Training.

The KAATSU Cycle should be done before every KAATSU session as an ideal warm-up protocol. You can start off at your usual Base SKU pressure and a conservative Optimal SKU pressure. Stretch while the KAATSU Air Bands are inflated and rest while the bands are deflated. Then increase your Optimal SKU pressure on the second (and subsequent) KAATSU Cycles.

For example, you can start with a Base SKU of 20 and an Optimal SKU of 200 SKU on the first KAATSU Cycle (that takes 3 minutes 20 seconds). Then you can increase the Optimal SKU to 250 SKU and 300 SKU respectively on the subsequent KAATSU Cycles. Continue to stretch or do other warm-up exercises as appropriate to your sport or activity.

Then, a few KAATSU Cycles can be repeated at the end of your KAATSU session or after your workout is over. First, do a complete release of the KAATSU Air Bands and get well-hydrated. Then re-apply the KAATSU Air Bands and do a few KAATSU Cycles. But in this case, you can slightly lower your Base SKU and use a lower Optimal SKU pressure to help flush out the lactic acid that may have built up during your workout.

You can walk or do simple stretching while you do the warm-down KAATSU Cycles that will help mitigate undesired muscle growth and increased girth.

The use of KAATSU Cycle is a safe and effective engorgement of blood in the limbs. A warm-up or warm-down while moving (e.g., walking or stretching) in such a physiological state will lead to improved preparation for vigorous training or greater efficiency in flushing out lactic acid that has built up.
Organizational Use of KAATSU

In an organizational setting of KAATSU where there are many (over 20 individuals) doing KAATSU at the same time and there are strict time limitations (e.g., at a military base or with an athletic team), KAATSU Global recommends the following protocols for KAATSU Group Lessons:

Each individual is first taught the proper location of the KAATSU Air Bands on their arms and legs and their safe Base SKU pressure.
Each individual is taught how to check their Capillary Refill Time (CRT).
Each individual is taught how to warm-up and warm-down and rehabilitate with the KAATSU Cycle mode.
Each individual is taught how to find their own Optimal SKU pressure - that will gradually change over time and vary between different exercises and activities (e.g., isometric versus aerobic exercises).
The leaders or coaches confirm each individual has a complete comprehension of the above.
During the KAATSU Group Lessons, each individual is responsible for constantly checking the CRT of their individual (or teammate to their right) if they are simultaneously doing the same activities.

The leaders or coaches are responsible for reviewing everyone’s CRT on a random basis.
The KAATSU Air Band sets can be shared for efficiency. Half of the group can use the bands on their arms while the other half of the group uses the bands on their legs.
If some individuals can do vastly more repetitions than their peers, then the leader or coach can ask those with greater abilities to slow down the pace of their repetitions and contract their muscles in the positive and negative directions.
If the leaders are coaches have very specific training sets (e.g., push-ups or core work or sprints), specific Optimal SKU levels may be varied (100-500 SKU) in order to accommodate the different capabilities of each individual.
KAATSU should be done on both legs and arms, and in the cases where there are significant differences between the strength or abilities of one limb versus the other limb, the Optimal SKU levels can be set differently for each limb.
More frequent use of KAATSU will lead to an increased elasticity of veins and capillaries.
KAATSU CYCLING

KAATSU Cycle is a sequential series of increasing pressure on the circumference of a limb by KAATSU Air Bands. The invention in Tokyo in 1973 by Dr. Yoshiaki Sato is based on his blood flow moderation concepts.

KAATSU Global has developed a series of commercial products - KAATSU Nano, KAATSU Master, KAATSU Master 2.0 - with this modality that has long been used by people of all ages and abilities from Navy SEALs and professional and Olympic athletes to aging Baby Boomers and individuals as old as 104 years.

The concept is patented (United States 9,775,619) as a Compression and Decompression Control System and Vascular Strengthening Method by Dr. Sato and is used by athletes preparing for the Olympics to individuals with cardiac issues including those who have just come out of heart bypass surgery at the University of Tokyo Hospital under the care of cardiologists Drs. Nakajima and Morita.

With the KAATSU Cycle modality, users benefit from doing rehabilitation and exercise with different levels of pressure and duration that are automatically applied. Different goals for different individuals are achieved based on the different protocols.

So, for example, a Navy SEAL or an NBA player might use Cycle 60 (i.e., 60 seconds of pressure followed by 20 seconds of no pressure in 8 sequential cycles as the pressure levels increase each cycle) for Performance Training (i.e., meant to improve strength, stamina or speed on a healthy individual) while a patient with a broken bone or a septuagenarian recovering from a knee replacement surgery might use Cycle 20 (i.e., 20 seconds of pressure followed by 5 seconds of no pressure) for rehabilitation.

The appropriate tightness for each individual based on a combination of their Base SKU pressure (i.e., manual tightening of the pneumatic bands) and Optimal SKU pressure (i.e., inflated tightening of the bands).

KAATSU Global offers numerous different KAATSU Cycle modalities depending on the person’s age, conditions and goals from Performance Training to Rehabilitation to Recovery - and is an ideal mode to get some quick and efficient exercise or stress relief in the office or work cubicle.
STRETCHING ARMS ABOVE HEAD WHILE SEATED

ADVANCED 3-POINT EXERCISES

3-POINT EXERCISES

HEAD ROTATIONS
Data from research at the University of Tokyo Medical School Hospital’s 22nd Century Medical Center from the Ischemic Circulation Physiology Department found that KAATSU leads to the secretion of Vascular Endothelial Cell Growth Factor (VEGF).

VEGF is known to enhance blood vessel neogenesis. The research found that various resistance exercises with KAATSU Air Bands lead to the secretion and activation of VEGF.

The research also confirmed that KAATSU increases vascular endothelial progenitor cells (EPC) using a strain gauge plethysmograph (EC 6 manufactured by Hokanson) that measured vascular endothelium.

The plethysmograph can conduct non-invasive evaluation of the elasticity of blood vessels and the endothelial function. Early detection of lifestyle-related diseases (e.g., arteriosclerosis) and the treatment evaluation of vascular endothelial function result by measuring parameters including arterial influx, venous volume, and venous outflow.

Using the vascular endothelium test measurement instrument, the researchers found that the more KAATSU is properly and safely performed following the standard KAATSU protocols, the more elastic the blood vessels can become.

That is, the more often KAATSU was performed, the greater endothelium elasticity was achieved.
KAATSU is has received recognition and coverage in prominent and prestigious publications.

"Can You Work Out Less, Get More Results?"
By Eleanor Warnock and Rachel Bachman
The Wall Street Journal
With Kaatsu, people do a light workout while wearing pressurized belts, first on the upper arms and then on the legs.

"Could the Kaatsu Workout Be the Most Efficient Exercise?"
By WSJ Video
The Wall Street Journal
Japanese bodybuilder Yoshiaki Sato says he has a way for Hollywood’s aging action stars to stay as youthful and fit as ever.

"You Should Probably Try This Japanese Blood-Flow Routine"
By Devon Jackson, Staff Writer
OutsideOnline.com
Footballers of both kinds have caught on. Here’s what you need to know.

Customer Service:
Call Toll-Free International +1-888-410-6350
e-mail: info@kaatsu-usa.com)
Designed for performance, recovery, rehabilitation and wellness applications

Touch-screen tablet offers personalized KAATSU Cycle options

Dual air compressors enable each limb to be simultaneously inflated to different pressures

WiFi connectivity enables automatic storage of user data in the KAATSU Cloud

www.kaatsu-global.com
The new KAATSU Master 2.0 is the fourth-generation KAATSU device that enables real-time monitoring and archiving of user’s physiological data. The 2.0 is ideal for use by individuals, corporations, organizations, physical therapy clinics, universities, hospitals, and teams.

2.0 is combined with the Masimo MightySat™ Finger Pulse Oximeter and a wrist blood pressure monitor that capture and archive your oxygen saturation, pulse rate, Perfusion Index, Pleth Variability Index and blood pressure readings in real-time.

**FEATURES**
- Designed for performance, recovery, rehabilitation and wellness applications
- Touch-screen tablet offers personalized and comprehensive KAATSU Cycle options
- Dual air compressors enable each limb to be simultaneously inflated to different optimally pressures
- WiFi connectivity enables real-time monitoring and automatic storage of data in the KAATSU Cloud
- Video feedback and interaction with KAATSU Master Specialists for real-time consultation
- Access to KAATSU Cloud where user information is automatically uploaded and archived
- Rechargeable battery
- Used with both the KAATSU Air Bands or KAATSU Aqua Bands
- Band pressure up to 500 SKU (Standard KAATSU Units)
- Reimbursable with CPT codes

**BENEFITS**
- Effective muscle toning
- Improved circulation
- Faster recovery from competition or vigorous workouts
- Anti-aging benefits
- Improved speed
- Enhanced stamina
- Increased strength
- Greater range of motion
- Significant time savings
- Convenience - exercise anywhere anytime
- Offers 6 levels of the KAATSU Cycle

**DATA MONITORING**
Masimo MightySat™ Fingertrip Pulse Oximeter and a Wrist Blood Pressure Monitor measures and monitors the following data during exercise or rehabilitation:
- Pulse Rate (PR) or the number of heart pulses per minute indicates your overall fitness and exertion levels
- Oxygen Saturation (SpO2) or the oxygen level in the blood indicates changes due to your heart or lung function, oxygen use by your body, and altitude
- Perfusion Index (PI) indicates the strength of blood flow to the finger as blood circulation changes
- Respiration Rate (RRp) or the number of breaths per minute indicates how well your heart and lungs are functioning and how quickly you recover from exercise
- Pleth Variability Index (PVi) or the variation in perfusion index over your breathing cycle which may indicate changes in hydration, breathing effort, perfusion or other factors.
- Blood Pressure (BP) indicates your systolic blood pressure and diastolic blood pressure.

**2.0 ALSO MEASURES AND ARCHIVES ADDITIONAL INFORMATION INCLUDING:**
- KAATSU Time (KT) or the amount of time spent doing KAATSU per session
- Capillary Refill Time (CRT) or the amount of time in seconds that it takes for your capillaries to refill with blood
- KAATSU Exercise (KE) or the type of exercise, movement or rehabilitation you do with KAATSU
- KAATSU Cycle Function (KCF) or the specific type of KAATSU Cycle (e.g., Cycle 20 or Customized Cycle)

**PACKAGE**
2.0 comes with 4 sets of KAATSU Air Bands or KAATSU Aqua Bands (Small, Medium, Large or Extra Large) and certification for KAATSU Specialists

**BAND SIZES**
KAATSU Air and Aqua Bands are available in 4 sizes: Small, Medium, Large and Extra Large. Measure the circumference of the top of your arm (right by your armpit) and the circumference of the top of your leg (right alongside your groin). Those circumferences will determine the appropriate size for your KAATSU Air Bands.

**ARMS**
- **Small:** less than 18 cm (7.06 inches)
- **Medium:** 18 - 28 cm (7.06 - 11.02 inches)
- **Large:** 28 - 38 cm (11.02 - 14.96 inches)
- **Extra Large:** 38 - 48 cm (14.96 - 18.89 inches)

**LEGS**
- **Small:** less than 40 cm (15.74 inches)
- **Medium:** 40 - 50 cm (15.74 - 19.68 inches)
- **Large:** 50 - 60 cm (19.68 - 23.62 inches)
- **Extra Large:** 60 - 70 cm (23.62 - 27.55 inches)