

EXERGEN

Temporal**Scanner**TM

TAT-5000 Series Professional Models

New Independent Studies Show Exergen Reduces Hospital Costs by 90% Compared to Other Thermometers



Invented, designed,
assembled, tested,
and packaged in the
U.S.A. by Exergen

- More than 70 published studies supporting accuracy from preemies to geriatrics, in all areas of care.
- TAT-5000S Connected Models available on leading Vital Signs Monitors for EHR data integration.
- Rugged, reliable construction, protected by Lifetime Warranty.

Register for
a Chance to
Win a Free

**Home Model
Thermometer**

www.exergen.com/TAT5000-819302



Changing the Way the World Takes Temperature

Exergen TAT-5000S Connected Models are now available on leading Vital Signs Monitors for EHR Data Integration



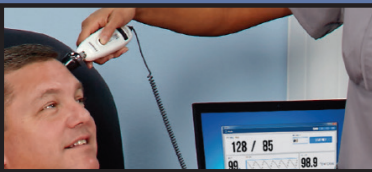
Philips SureSigns VS4



GE Healthcare VC150, V100, Corometrics



Capsule SmartLinx Vitals Plus



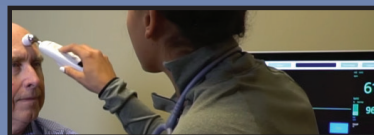
Midmark IQvitals® Zone



Spacelabs Qube®, Xprezzon®, Qube® Mini



ZOE 740Select



Schiller Diagnostic Station DS20

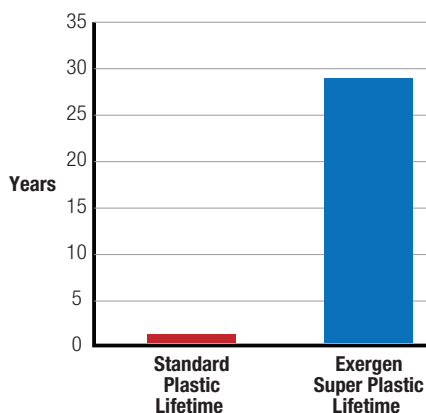
TAT-5000 Series Professional Models

Exergen Super Plastic Wins the Battle of Cracked Cases Caused by Chemical Disinfectants

Nearly 30 Times
More Resistant
to the Harshest
Chemicals

Exergen has developed a new proprietary engineered plastic material for housings which resists the harshest chemical cleaners in use in hospitals at least 29 times longer than current materials.

After two years of research and testing, Exergen has succeeded in its objective of eliminating case cracking caused by harsh chemical disinfectants commonly used in hospitals. The proprietary Exergen Super Plastic cases are now used in all Exergen TemporalScanner TAT-5000 Series professional models.



TAT-5000



TAT-5000S

Convenience and Security Options



Wallmount 134201
(TAT-5000 not included)



Quick Release Security System:
124277 (Core) 124278 (Oral Equiv)
Includes TAT-5000, Wallmount
134201, Latex free coiled cable



Quick Release Security System:
124286 (Core) 124287 (Oral Equiv)
Includes TAT-5000, Wallmount
134201, 8' Latex free nylon
covered steel cable



Dual Security System
5 or 20 Temps before Lockout
5: 124280 (Core) - 124281 (Oral Equiv)
20: 124392 (Core) - 124393 (Oral Equiv)
Includes: TAT-5000, Requires
Keyless Locking Wallmount 134307



Quick Release Security System:
124288 (Core) 124289 (Oral Equiv)
Includes TAT-5000, Wallmount
134305, Latex free coiled cable



Quick Release Security System:
124290 (Core) 124291 (Oral Equiv)
Includes TAT-5000, Wallmount
134305, 8' Latex free nylon
covered steel cable



Dual Security System
5 or 20 Temps before Lockout
5: 124280 (Core) - 124281 (Oral Equiv)
20: 124392 (Core) - 124393 (Oral Equiv)
Includes: TAT-5000, Requires
Keyless Locking Wallmount 134308



Quick Release Security System:
124292 (Core) 124293 (Oral Equiv)
Includes TAT-5000, Wallmount
134306, Latex free coiled cable



Quick Release Security System:
124294 (Core) 124295 (Oral Equiv)
Includes TAT-5000, Wallmount
134306, 8' Latex free nylon



Roll-A-Bout
Part # 129455, 5-leg rolling stand,
double basket, 6' vinyl covered steel
cable, lock & key.



8' Security Cable
Part #124309 - Coiled Cable
Part #124311 - Latex Free Coiled Cable



Nylon Covered Steel Cable
Latex Free
6' Cable - Part #134302
8' Cable - Part #134030

- **Quick Release System:** A discrete method for easily removal and reattachment of the cable when required.
- **Dual Security System:** A system requiring return of the instrument to the holder after 5 or 20 temperature measurements.
- **Suggestions for Selection:**
 - If instruments are to be secured at the nurses' station, consider the keyless locking wallmount or Dual Security System.
 - If instruments are to be mounted one per bed, or in a dedicated area (e.g. triage), consider Quick Release System.
 - If instruments are to be attached to an existing rolling stand, or a vital signs monitor, consider the 6' vinyl covered steel cable 134302.

Infection Control Considerations

Methods of Cross-Contamination Protection: Unlike most other thermometers, the Exergen TemporalScanner does not come into contact with mucous membranes, and as such, the following options are available against the risk of cross-contamination when using the instrument between patients.

Alcohol Swabs: The vast majority of hospitals have approved wiping the probehead between patients with an alcohol swab or other disinfectant wipe, the typical method of choice for disinfecting the stethoscope diaphragm between patients, and the most cost effective method. 70% isopropyl alcohol is recommended.

Resposable/Disposable Covers:

Resposable/Disposable covers, meaning they can be used once and discarded, or reused on the same patient, are available for all levels of cross-contamination protection should they be preferred for certain patient populations, and are still very cost effective. These options include resposable caps and full instrument sheaths, the sheaths being mainly used for isolation patients.

Routine Maintenance:

With normal use, the only maintenance required is to keep the lens in the center of the probe clean. Periodic lens cleaning is a must. Dirt, greasy films or moisture on the lens will interfere with the passage of infrared heat and affect the accuracy of the instrument. Only alcohol should be used on the lens, and this warning is prominently affixed to the front of each instrument as shown on the right.

- Clean the lens with a cotton tipped stick applicator (Q-Tip, Cotton Bud, etc.)moistened in alcohol or with an alcohol swab.
- Twisting an alcohol swab to clean the lens is not recommended, a stick applicator must be used to reach and clean the little lens deep in the center of the probe head.
- Cleaning the little lens every two weeks (biweekly) is recommended.

Use of Aggressive Chemical Disinfectants for Decontamination:

Strong bleach-based and ammonium-based products have become very common due to heightened concerns regarding the risk of nosocomial infections, but these aggressive disinfectants can damage most plastics. Fortunately Exergen has developed and uses a proprietary "Super Plastic" that resists cracking by the harshest chemicals in use in hospitals.

Alcohol only applies to the IR sensor lens, as the bleach and ammonium based products may leave a residue on the sensor lens which would interfere with the accuracy of the measurement.

Further Information or Questions:

Please visit our Clinical Education Website at www.TAthermometry.org, or our Main Website at www.exergen.com, or contact service@exergen.com.

Using the Resposable/ Disposable Caps:



1. Apply cap by pushing onto the probehead with fingers.
2. Remove cap by pushing edge forward with thumb.
3. Caps may be reused on the same patient.

Using the Full Instrument Sheaths:



1. Insert instrument into sheath bottom end first. If instrument is on a cable, insert probe end first and twist sheath at neck with fingers to assure film is smooth over probe lens.
2. Wrap additional film around probe neck. Film should be smooth over probe lens.
3. Slide additional film under fingers while using.

3-Step Method to Successful Inservicing

Actions Required of Nursing Staff:

Step 1: View Exergen's Virtual Classroom Training Video.



Competency Assessment for Exergen TA Thermometer

Prior Name: _____ Date: _____

Unit: _____

Circle the best answer and write the letter of that answer on the line in front of the number.

1. Temporal artery thermometers measure the patient's:
a. forehead temperature.
b. core body temperature.
c. skin temperature.
d. chest temperature.
2. Core temperature will show a spike in patient temperature:
a. five minutes before the axillary temperature.
b. 10 to 15 minutes after axillary temperature.
c. one hour before axillary temperature.
3. The temporal artery thermometer measures the temperature of the temporal artery and reflects the core temperature of the body. In the case of the patient who has been febrile, and the fever is now breaking, the temporal artery sensor will read:
a. normal. There should be no change because the core temperature will reflect the change more rapidly than the axillary.
b. Higher than axillary temperature because the core temperature takes longer than the rectum to reflect the change.
c. The same because it is not under heat or stress.
d. Lower because environmental factors will always affect core temperature.
4. The temporal artery thermometer may give inaccurate reading if:
a. The face is dirty.
b. The patient has just finished drinking very warm liquid.
c. All of the above.
d. 1 and 2.
e. None of the above.
5. Core temperature measurement reflects changes in body temperature:
a. slower than
b. the same as
c. faster than
d. none of the above.
6. It is important to clean the lens of the probe with a cotton tip and apply it to the forehead with an alcohol prep pad.
a. Every one minute.
b. Every five minutes.
c. When the patient is discharged.
d. There is no time limit on when this should be done.
e. All of the above.
f. 1 and 2.
g. None of the above.

SKILL PERFORMANCE	YES	NO
1. Explain procedure to patient.		
2. Clean forehead of temporal artery sensor between patients.		
3. Place probe flat on center of forehead, depress button, and hold until sensor on the screen turns on.		
4. Hold probe to forehead to ensure the forehead is in the field.		
5. Lift probe from forehead and watch the field cell disappear on the touch screen till probe.		
6. Release button and read temperature.		
7. Record temperature on patient profile sheet.		
8. Verify time correlation for any abnormal results.		
9. Document on charting the time of the temporal artery thermometer.		

Employee: _____ Date: _____

Instructor: _____ Date: _____

Step 2: Take the competency evaluation. (copy attached)

Step 3: Provide a return demonstration to the satisfaction of the nurse educator.



Successful inservicing for the Exergen TemporalScanner Thermometer is accomplished in just 3 well-proven steps that follow below. Allowing 30 minutes for a Train-the-Trainer/Super Trainer or other classroom session incorporating the 3 steps below, and supervised by a nurse educator or a monitor, will accomplish the training goals of good patient care, in addition to eliminating unit based training, which is not only costly and disruptive to patient care, but has been proven ineffective for competent product training.

The Actions Required of Nursing Staff:

1. View Exergen's Virtual Classroom Training Video.
2. Take the competency evaluation (copy attached).
3. Provide a return demonstration to the satisfaction of the nurse educator or monitor.

The 3 Tools for Success:

1. Exergen's Virtual Classroom Training Video

- a. A 15 minute training video containing the information to ensure staff is clinically and functionally skilled in the use of the Exergen TemporalScanner Thermometers.
- b. The Virtual Classroom is available on CD's and at www.exergen.com/virtualclassroom
- c. Uploading to the hospital's intranet where all staff, including medical staff, can view PRN is highly recommended.

2. Competency Evaluation

A multiple choice evaluation, the answers to which are contained in the video.

3. Return Demonstration

Taking a temperature on another attendee to the satisfaction of the nurse educator or monitor prior to leaving the session takes just a few seconds and will assure proficiency.



Contacting Exergen with Clinical Questions or for Training Material:

Clinical Questions:

617-923-9900 x 6202
medical@exergen.com
www.TAThermometry.org

Training Material:

617-923-9900 x 6234
service@exergen.com
www.TAThermometry.org

For educational videos, clinical studies, & manuals:

www.exergen.com/www

To evaluate, email:

medical@exergen.com

Competency Assessment for Exergen TA Thermometer

EXERGEN
TemporalScanner™

Print Name: _____

Unit: _____

Date: _____

Choose the best answer and write the letter of that answer on the line in front of the number.

1. Temporal artery thermometers measure the patients'

- a. Ambient air temperature.
- b. Core body temperature.
- c. Skin temperature.
- d. Oral temperature.

2. Core temperature will show a spike in patient temperature:

- a. One to two hours later than rectal temperature.
- b. At the same time as rectal temperature.
- c. One to two hours sooner than rectal temperature.

3. The temporal artery thermometer measures the temperature of the temporal and carotid arteries, reflecting the core temperature at the heart. In the case of the patient who has been febrile, and the fever is now breaking, the temporal artery scanner may read:

- a. Lower than a rectal thermometer because the core temperature will reflect the change more rapidly than the rectum.
- b. Higher than a rectal thermometer because the core temperature takes longer than the rectum to reflect the change.
- c. The same because it does not matter how or where temperature is measured.
- d. Lower, because environmental factors will always affect core temperature.

4. The temporal artery thermometer may give inaccurate reading if:

- 1. The lens is dirty.
- 2. The side of the forehead measured has been resting on the pillow.
- 3. The patient has just finished drinking iced water.
 - a. 1 only
 - b. All of the above
 - c. 1 and 3
 - d. 1 and 2
 - e. None of the above

5. Core temperature measurement reflects changes in body temperature _____ oral or rectal temperature measurement.

- a. Slower than
- b. The same as
- c. More quickly than

6. It is important to clean the lens in the center of the probe with a cottontipped stick applicator (Q-Tip) dampened with an alcohol prep pad.

- 1. Every two weeks
- 2. After each use
- 3. When the patient is discharged
- 4. If lens is not shiny and mirror-like
 - a. 1 only
 - b. All of the above
 - c. 1 and 3
 - d. 1 and 4
 - e. None of the above

Employee _____

Date _____

Instructor _____

Date _____

EXERGEN
TemporalScanner™

Competency Assessment answers located on inside back cover or at:
<https://www.exergen.com/assessment>

Clinical Studies

Peer-Reviewed Published Papers, Abstracts, Letters on Exergen Temporal Artery Thermometry as of May 14, 2018

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Ensuring Cost Savings Reality... by Virtual Innovation

Virtual Classroom ensures cost savings, waste reduction, and enhanced patient care by training and supporting millions of caregivers in new thermometry technology. So exactly how does it work?

What is the cost savings reality you are referring to?

Francesco Pompei. Temporal artery thermometry (TAT) has produced an estimated \$100 million in direct cost savings and 10,000 tons of waste reduction in the last few years for healthcare institutions. For a typical 300-bed hospital, this translates to nearly \$100,000 in unnecessary costs and two tons of waste eliminated per year. Furthermore, a recent independent study reported that TAT also saves 87 percent of nursing time used for taking temperature.

These are certainly impressive numbers. How does new thermometry technology do this?

FP. TA thermometry lightly scans the intact skin of the forehead, placing it in the same category as a stethoscope — simply clean between patients with the same wipe used

with the stethoscope. Conventional thermometry systems require a probe to be inserted into a body cavity, which in turn requires robust protection from contamination by applying a single-use disposable cover. The dramatically reduced use of disposable probe covers is a major benefit from TA thermometry, eliminating approximately 90 percent of the direct cost of providing this vital sign. In addition, since there is no small fragile probe to be inserted into a body cavity, TAT can be designed to be far more robust than conventional thermometry, and can carry a

lifetime warranty. This not only eliminates direct repair costs, but also greatly reduces all of the indirect costs, such as removal of equipment from service, evaluation by biomedical engineering, return to the manufacturer, receipt of the repaired device and reinstallation to service. Since typical payback for TA thermometry is measured in months, hospitals using TAT have effectively eliminated the cost of patient temperature as a vital sign.

How can you provide technology training and support for millions of caregivers without substantially increasing your own costs?

FP. Comprehensive training for new technology always carries a very high cost, particularly a technology that is used as extensively (millions of users) and across as many skill sets (MDs to RNs to PCAs) as thermometers. The supplier's cost in providing this training necessarily has to be passed along as part of the cost of the thermometry system. For the older thermometry systems, the unending stream of payments from disposables and repairs paid for the costs of training and support. For TAT, since only 10 percent of the cost of the older thermometry systems is available as revenue, we had to innovate to preserve the savings for hospitals. There is also a substantial cost for the hospital in maintaining competency levels on all equipment used in patient care, which new technology should not increase, but preferably reduce. This is where avatars and the Virtual Classroom come into play.



Francesco Pompei is Founder and CEO of Exergen Corporation, and holds 60 US patents in noninvasive thermometry for medical and industrial applications. Earning BS and MS degrees from MIT, and an SM and PhD from Harvard, Dr. Pompei also holds an appointment as Research Scholar in the Dept of Physics at Harvard.

EXERGEN
TemporalScanner™

"When five senior physicians in a major university teaching hospital crowded around an iPhone's three-inch screen, watched intently, requested a replay, and then described it as 'brilliant', we knew we were on the right track"

Why avatars in a Virtual Classroom?

FP. Because we found that everyone is fascinated by this medium, and enjoys and pays attention to the content. Training videos, written materials, and even personal in-servicing tend to be boring and are often ineffective, requiring frequent and expensive follow-up by both supplier and hospital educators. Avatars are compelling. The movie of the same name, vast numbers of video games, and extensive social networking are testament to the their effectiveness in capturing the attention of the viewers, which is the most important element in training and support of millions of users. The Virtual Classroom presents familiar scenes and interactions for clinicians, but with avatars substituted for real people.

An important cost advantage to the supplier is the ease in which the Virtual Classroom can be updated to include new training, new products, or new methods. In turn, this lower cost translates into lower cost for TAT users in healthcare.

What convinced you that it would work?

FP. When five senior physicians in a major university teaching hospital crowded around an iPhone's three-inch screen, watched intently, requested a replay, and then described it as "brilliant", we knew we were on the right track. When 35 nurses crowded around an iPad's 10-inch screen, watched intently, laughed at the avatar interactions as similar to their real life colleagues, and exclaimed "such a great idea" we knew our primary audience would be engaged. And the final test was when 1000 nurses and PCAs were trained for TAT by viewing the Virtual Classroom on a large projection screen. The

subsequent written competency exam was passed by 100 percent of the attendees, and the return demonstration was passed by 99.9 percent on the first try. Prior to the Virtual Classroom, the initial pass rates on personal in-servicing could be as low as 50 percent, which was costly for both supplier and hospital to remedy. The Virtual Classroom is a major improvement and cost benefit for both hospital and supplier.

How do sales people respond to the Virtual Classroom?

FP. With a standing ovation. First they learned what they needed to know very quickly and efficiently, and then realized how easily they could provide excellent training and support for their customers by employing the Virtual Classroom.

How about Nurse Educators?

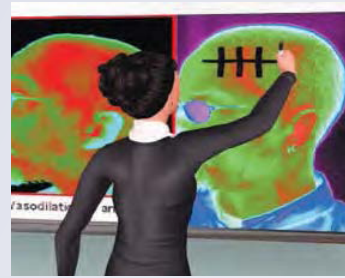
FP. They immediately embraced the Virtual Classroom, as it made it possible for them to assure correct training on new technology, without increasing costs. This is particularly important given the staff reductions that many hospitals are facing. Nurse Educators have become strong advocates of the Virtual Classroom as an important tool to help them do their jobs.

How are hospitals implementing Virtual Classroom?

FP. By uploading the Virtual Classroom to their intranet, all clinicians have convenient access at all times. This allows staff to review the TAT science and methods at their convenience rather than at specific times that might compete with patient care. Those without an intranet provide a Virtual Classroom CD to all nursing units. The Virtual Classroom also includes internet links for more detailed clinical information.

How much does the Virtual Classroom cost the hospital?

FP. Zero. We provide this tool free of charge. The Virtual Classroom copyright explicitly gives permission for any use in connection with TAT. A convenient flash version is also available at www.exergen.com/virtualclassroom that can be accessed anytime. High resolution CDs are available on request by emailing medical@exergen.com.



Renewing the Oldest Vital Sign

Fever was known as a vital sign to ancient Egyptians at least 5000 years ago, using the hand as measuring instrument. Galileo invented the first thermometer 500 years ago. Carl Wunderlich, 'Father of Clinical Thermometry,' proposed 98.6°F (37°C) as the mean normal temperature 140 years ago. Until very recently we have been taking patients' temperatures more or less the same way for more than 100 years, circa 10 billion measurements per year worldwide (approximately half in the US). Can we improve on what we have been doing for thousands of years and countless billions of times? Emphatically yes.

Today's patient expectations

Importantly, today there is a much higher patient expectation of non-invasiveness. After all, the 10 billion temperatures mean a similar number of probe insertions into a body cavity, causing discomfort and unnecessary indignity, as well as some risk of harm. Patients undergoing cancer treatment are grateful for a reprieve from things that hurt, when their temperature is taken with the latest non-invasive methods. It is not uncommon today for a parent to refuse to permit a rectal thermometer to be used on their child.

Non-invasiveness is unachievable if the vital sign lacks the necessary clinical accuracy. The scientific and engineering challenge is to accurately measure the temperature inside, from the outside. From medical science we have learned that certain external locations have useful properties for ascertaining internal temperature. The ear, for example, has a 50-year history of investigation for thermometry, and in the last 20 years devices developed on this principle have been widely used. Although perhaps less invasive than older methods, inserting a probe into an ear is not what patients consider non-invasive. Further, there are accuracy problems, particularly with small children.



Francesco Pompei is founder and CEO of Exergen Corporation, and holds 60 US patents in non-invasive thermometry for medical and industrial applications. Earning BS and MS degrees from MIT, and SM and PhD degrees from Harvard, Pompei also holds an appointment as Research Scholar in the Department of Physics at Harvard in cancer research.

Back to the future

As inventor of much of the ear thermometer technology in use, Exergen was asked by physicians to reconsider non-invasive thermometry, since ear thermometers were not an acceptable solution to the patients' requirement for non-invasiveness and the clinicians' requirement for accuracy. Within this context we re-examined the medical science of fever assessment, going back not 50 years, but 5000 years, to the hand on the forehead.

Although never precise enough for clinical accuracy, laying a hand on the forehead provided useful fever indications under certain conditions, and was safe, gentle and a reassuring caress for the patient. Preserving these desirable attributes while making the measurement robust and reliably accurate for clinical use for all ages was the challenge. Our mathematical models indicated we needed to find an easily accessible external skin surface with high and consistent perfusion. We found this property at the superficial temporal artery, where it traverses the forehead. A measurement modality was developed based on scanning the temperature of the skin over the temporal artery, and with proprietary algorithms we could then accurately compute the internal core temperature, for all ages, under essentially all clinical conditions.

In the past five years Temporal Artery Thermometry has become widely accepted and is responsible for about 0.5 billion temperatures per year by medical professionals in the US, a very good start in reducing the number of probe insertions into body cavities and improving the clinical experience for both patients and clinicians. About two million consumers have home versions for their personal use.

"From medical science we have learned that certain external locations have useful properties for ascertaining internal temperature."

Future with zero cost and zero waste

An unexpected benefit of Temporal Artery Thermometry is that without insertion into a body cavity there is no requirement for disposable probe covers, and simple wiping is adequate. Thus, future operating budgets for thermometry in institutions using only Temporal Artery Thermometers are zero. Furthermore, with disposable waste eliminated, the institution contributes significantly to 'green' operations, while reducing storage space and handling costs. In the past two years, US institutions have saved approximately \$40 million in disposable costs, and 3000 tons in disposable waste. With Temporal Artery Thermometry initial cost is about the same as other thermometry devices available and acquisition cost is usually less than one year of disposables cost, thereby not requiring capital budgeting.

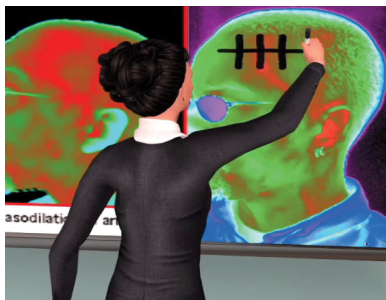


New Independent Studies Show Exergen Reduces Hospital Costs by **90%** Compared to Other Thermometers

"Yielded clear-cut cost savings that increased exponentially with increasing duration of use and increasing bed numbers per device."

[1] Hayes K, Shepard A, Cesarec A, et al. Cost minimisation analysis of thermometry in two different hospital systems. Postgrad Med J Published Online First: 18 January 2017, doi:10.1136/postgradmedj-2016-134630

- **Patients love the TemporalScanner!**
- **Cost savings of 90% over other thermometry methods**
- **Lifetime Warranty – unique to thermometry**
- **Chemical resistant materials stand up to harsh disinfectants**
- **On-demand, innovative, inservicing results in successful usage for all levels of nursing skills**



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For clinical information, visit:
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For educational videos,
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