INTERNET NEWS

BS. Nguyễn Văn Công

Innovative breathalyzer device could improve diabetes management using IU technology

Jun 6, 2025

A prototype of isaac by PreEvnt, a small lightweight device that can be worn on a lanyard to provide easy and accurate information about blood sugar levels from breath, developed based on research from the Integrated Nanosystems Development Institute at IU Indianapolis. *Photo by Liz Kaye, Indiana University*

- For the nearly 40 million Americans living with diabetes, an important part of managing the disease is monitoring blood sugar throughout the day and night.
- But staying on top of this information is challenging, especially for younger patients who may fear the finger pricks required. And other methods that aren't as invasive, such as continuous glucose monitors, still ask users to insert a sensor under the skin and wear a small transmitter whose visibility may make some users uncomfortable.
- A new device based on research from Indiana University could one day provide an alternative — or supplement current methods to provide better protection against more serious swings in blood sugar. It might also help individuals at risk for Type 2 diabetes better monitor their blood sugar to reduce their risk of the disease.
- Isaac by PreEvnt, a subsidiary of Scosche Industries, is a small lightweight device that can be worn on a lanyard around the neck to provide easy and accurate information about users' blood sugar using only their breath.
- The breathalyzer technology was developed in collaboration with the Integrated Nanosystems Development Institute at IU Indianapolis, and was inspired by diabetes alert dogs. These service animals are trained to detect when their owners experience hypoglycemia, a dangerous condition that can lead to serious complications, including coma, if not treated promptly.
- "Our lab was able to successfully identify the specific molecules in breath that correlate with hypoglycemia, which is the 'scent' that diabetic alert dogs can detect," said Mangilal Agarwal, a professor in the IU Luddy School of Informatics, Computing and Engineering at IU Indianapolis and director of the Integrated Nanosystems Development Institute, which works closely with IU Launch Accelerator for Biosciences. "In addition to identifying these molecules, our lab is testing nanoscale sensors to detect them, while also collaborating with partners to commercialize the technology."

Diabetes affects about 38.4 million people in the United States, or 11.6% of the population, according to the CDC National Diabetes Statistics Report, and an estimated 830 million people worldwide, according to the World Health Organization. The condition is also the most expensive chronic disease, with costs reaching $412.9 billion annually in the U.S., according to the American Diabetes Association.

But early diagnosis can dramatically mitigate the most severe impacts of the disease, such as kidney failure, heart attack, stroke, blindness and lower limb amputation.

Developed by PreEvnt in collaboration with IU, the isaac device uses sensors from the Nanoz Group to detect chemicals in breath that correlate to blood glucose levels. The compounds it detects were identified at IU, and Agarwal's research team is working to qualify the sensor devices in the laboratory.

"This device has the potential to offer real advantages over current monitoring technology," said Agarwal, whose lab is also developing sensors. "Continuous glucose monitors require insertion into the body to measure interstitial fluid and provide insulin, and need frequent replacement. Finger pricking, which must be done multiple times a day, is also invasive and often impractical. Non-invasive monitoring in real time can help mitigate these challenges."

Agarwal's lab is partnering with the IU School of Medicine to test and validate the effectiveness of the device in individuals with diabetes — an important next step on the path to wider commercialization.

The trial will be conducted under the guidance of Dr. Linda DiMeglio, the Edwin Letzter Professor of Pediatrics at the IU School of Medicine. Assessing how accurately the device can monitor blood glucose levels compared to traditional methods will be crucial to understanding the potential benefits for patients, she said.

While the Integrated Nanosystems Development Institute leads engineering and chemistry for the project, "Our group's role is to advise on the clinical aspects — obtaining regulatory approvals, recruiting participants, assisting with data analyses," DiMeglio said. "Depending on the study results, we want to be able to bring this device to the broader market quickly, especially in children.

She also noted that diabetes is an expensive condition due to the cost of insulin and other equipment.

"We see children as young as 1 year old with diabetes in our clinic, which places a real burden on families," she said. "Introducing an affordable, non-invasive device for young children would be incredibly beneficial."

- In preliminary work leading up to this trial, Agarwal's lab partnered with a summer camp for children with diabetes led by DiMeglio in Indianapolis. Participants at the camp provided some of the early-phase research data for Agarwal's initial study on the viability of blood sugar breathalyzer technology. More recently, the lab published a new study on the topic in the journal Nature Scientific Reports, focusing on clinical validation of the results from the pilot study.
- Although the utility of the breathalyzer as a non-invasive alternative will ultimately depend on its speed and accuracy at measuring blood sugar, DiMeglio said it's most immediate impact may be supplementing existing measurement methods.
- For example, the device could potentially be worn at night to alert individuals if their blood sugar drops to dangerously low levels while sleeping. It could also potentially work in concert with a portable insulin pump to calibrate small dosage adjustments throughout the day.
- "The clinical trial work will really help us further refine the device for maximum user benefit," said Mark Woollam, a senior research scientist in Agarwal's lab who is assisting with the trial. Nate De Jong, a Ph.D. researcher in DiMeglio's lab, is also coordinating access to the camp and other patients.
- "Everything we're working on in our lab, we're working on because we want to solve real-world problems — and the most effective way to get those solutions to people is by taking it to consumers and the market," Agarwal said. "It's our desire to make a tangible impact on people's lives."

Medscape Medical News

Popular Joint Supplement Tied to Faster AD Progression

Megan Brooks

June 16, 2026

- Glucosamine, a popular joint-pain supplement, may worsen outcomes in people with mild cognitive impairment (MCI), and a newly identified metabolic pathway involving excessive protein glycosylation could help explain why, new research suggests.
- In a large electronic health record analysis, glucosamine use was associated with a 25% higher likelihood of progression from MCI to dementia over 5 years. Experiments in human brain tissue and mouse models suggested that excessive protein glycosylation may contribute to Alzheimer's disease (AD) progression and that glucosamine supplementation could exacerbate the process by fueling glycan production.
- Although preliminary, researchers said the findings point to glycan metabolism as a possible therapeutic target and raise questions about the safety of glucosamine use among patients with established dementia.
- "In the United States, there are about 7 million people living with Alzheimer's and millions more with related dementias such as Lewy body or frontotemporal dementia. A lot of these people actively take an over-the-counter supplement that could be making their disease progression worse," senior investigator Ramon Sun, PhD, director of the Center for Advanced Spatial Biomolecule Research and associate director for innovation at the McKnight Brain Institute at the University of Florida, Gainesville, Florida, said in a statement.

Brain Hit From Glucosamine?

Using electronic health records, researchers identified more than 24,000 patients with AD and related dementias (ADRD) and nearly 42,000 patients with MCI. About 8% of patients in both cohorts reported taking glucosamine.

After adjustment for age, sex, and demographic variables, glucosamine use was associated with a 25% higher likelihood of progression from MCI to dementia over 5 years ($P < .0010$). Among patients with ADRD, taking the supplement was associated with a 25% increased risk for mortality at 10 years ($P = .0023$).

Because the analysis was observational, it remains unclear whether glucosamine directly contributed to worse outcomes or was associated with other factors linked to disease progression, researchers noted.

Still, the electronic health record data are "very provocative," co-author Matt Gentry, PhD, chair of the Department of Biochemistry and Molecular Biology, University of Florida, said in a statement.

"While it's an association and not proof of causality, it does raise an important clinical question that now deserves much more attention," he noted.

New Metabolic Driver of AD?

Mechanistically, previous studies have reported glycosylation changes in AD, but whether those changes contribute directly to disease progression has remained unclear.

To test the hypothesis that hyperglycosylation may be an active contributor to disease progression, the investigators used a combination of spatial metabolomics, lipidomics, and glycomics technologies to analyze postmortem human AD brain tissue and established mouse models of AD.

In human AD brain tissue, they observed evidence of increased glycan biosynthesis and widespread hyperglycosylation in both gray and white matter. Glycan abundance increased progressively with increasing neuropathologic disease severity, as measured by Braak staging.

In AD mice, suppressing glycosylation enzymes ameliorated cognitive deficits, while oral glucosamine supplementation exacerbated behavioral impairments, findings that the authors said support a causal role for glycan dysregulation in disease severity.

"These findings suggest that hyperglycosylation is not simply a secondary feature of neurodegeneration but may function as a critical driver of AD pathology," they wrote.

They called for a large, double-blind clinical trial to evaluate the potential impact of glucosamine on AD progression at the population level. "This study provides a foundation for future translational efforts aimed at modulating glycan metabolism as a therapeutic approach in AD," the authors concluded.

Signal That's Hard to Dismiss

hat makes the study novel is that it doesn't just identify a biomarker, said Shaheen Lakhan, MD, PhD, a neurologist and earcher based in Miami, Florida, who was not part of the research.

suggests we may be looking at part of the engine rather than just the smoke coming out of the exhaust pipe," Lakhan d *Medscape Medical News*.

he hyperglycosylation hypothesis is biologically plausible. Glycosylation is essentially the cell's molecular labeling and pping system. Proteins need the right sugar tags to fold correctly, travel to the right destination, and perform their intended ction," Lakhan said. "What this study suggests is that in Alzheimer's disease, that system may be running in overdrive."

e convergence of evidence adds to the paper's strength, he added.

he investigators found excessive glycosylation in human Alzheimer's brains, reproduced it in two very different mouse dels, tracked increased glycan production in real time, and then showed that dialing glycosylation down improved cognitio ile pushing it higher worsened cognition," Lakhan said. "When human tissue, animal models, metabolic tracing, and havioral outcomes all point in the same direction, it's hard to dismiss the signal."

l, he cautioned against declaring hyperglycosylation a primary cause of AD.

lzheimer's is less like a single broken circuit and more like a citywide power failure involving amyloid, tau, inflammation, cular dysfunction, and metabolic stress. Hyperglycosylation may be another failing power station in that network – portant, but probably not acting alone," Lakhan said.

early, the glucosamine findings are what will grab the most attention because millions of older adults take it every day, khan commented.

hat makes the finding noteworthy is that glucosamine has never consistently delivered dramatic clinical benefits for most conditions for which it's marketed. If a supplement offers modest or uncertain benefit but now carries a plausible signal fo m in Alzheimer's disease, clinicians should at least pay attention," he said.

wever, based on this study, Lakhan doesn't think every patient with MCI or dementia should immediately stop glucosamin

he human data are observational and cannot prove cause and effect. But it does change the conversation," he said. "Until no cosamine was largely viewed as a benign supplement. This study raises the possibility that, in the Alzheimer's brain, it ma adding fuel to a fire we are trying to extinguish."

CLINICAL NEWS | MRI

Metallic and cat-eye nail polish in MRI

By — Kristin Seitz, Tobias Gilk

Jun 17, 2026

- If you're on social media, or anywhere on the internet for that matter, you've likely seen warnings about cat-eye nail polish being "unsafe" to wear during an MRI scan. There are numerous social media posts, videos, and articles from purported experts warning of the potential for heating and patient burns.
- Provider-level responses to this perceived new risk are often to refuse patient access to MRI for those with metallic nail polish or delay an exam while the material is -- at least in one case -- ground off from the patient's fingernails.
- What is cat-eye nail polish?
- Cat-eye nail polish is a gel polish containing fine particles of iron oxide. While the polish is wet, these particles can be manipulated into various holographic patterns by holding a small magnetic tool, often in the cap of the polish bottle, close to the nail. After the desired pattern has been achieved, a clear topcoat is applied and is allowed to dry or cure under UV light.
- Why the hubbub? Metallic particles are not unique to nail polish. Iron oxide is a common ingredient in many cosmetic products -- mascara, bronzer, tinted sunscreen etc. Yet we don't see TikTok videos warning patients to wash their faces or arrive for their MRI without makeup. It's likely the fact that the materials are promoted as "magnetic" that has increased the level of MRI safety anxiety over this particular cosmetic.

isks/potential risks

eating

ne radiofrequencies (RF) used during MR imaging impart a significant amount of energy into patients and, whe at energy is focused or concentrated, it can cause heating and burns. Notice the word "can," not "will.“

o date, there have been no FDA MAUDE reported incidences of RF heating of metallic nail polish -- or any her topical cosmetic product. ASTM/US FDA standards indicate that objects with an electrically conductive ngth of 2 cm (approximately 0.75 inch) or less are not at risk of clinically significant levels of RF heating (whi to say, heating significantly more than the surrounding tissues) in MR imaging at 3.0 T or lower field strength en when the object is within the volume of RF energy deposition.

hy is this true? Let’s take what we know about resonant circuitry. For an object to heat via resonant circuitry nen exposed to RF, the electrically conductive length of the object needs to closely match ½ wavelength of the ansmitted RF. For a 1.5-T MRI scanner, which uses an RF transmit frequency of 64 MHz, this length would be out 25–30 cm (approximately 12–13 inches) inside human tissue, and much longer in air. At 3.0 T, which uses RF transmit frequency of 128 MHz, the length of greatest concern would be approximately 12–15 cm (roughl -7 inches) in human tissue, and much longer in air. This is because resonant circuit heating risk inversely rrelates electrical length with field strength of exposure: higher field strength = risk of shorter conductive obje ating. The physics of the different field strengths and transmit RF frequencies makes the ASTM/US FDA blished 2-cm length of concern rather conservative, particularly at lower field strengths.

rtifacts

ne risks of image distortion or artifacts are real. The presence of metallic and magnetic objects/substances insid e bore alters the main magnetic field, which in turn alters the precessional frequency of hydrogen protons, whi n cause image artifacts. The reach of these artifacts or distortions will depend on several factors, including fiel rength, the magnetizability of the materials involved, the pulse sequences being run, and more. But at their orst, these artifacts will generally only extend only a few inches from the object. Thus, with respect to imaging is risk should only really apply to imaging of the hand, wrist, or anatomy that is very close to the placement of e hand during imaging.

eating potential/risk management

eating effects are a result of interactions of materials with the transmitted RF during MR exams. For the polish teract with transmitted RF, the hands need to be within the volume of the RF transmit coil. While MRI anufacturers do all provide spatial information about the static magnetic field and time-varying gradients roughout the bore, curiously they do not routinely provide end user information on the physical extents of the tegrated RF body coil. For many systems the volume of RF deposition extends approximately 30 cm (1 ft) both perior and inferior from isocenter, for a roughly 60-cm (2-ft) superior-to-inferior volume of the bore.

ortunately, the polish is on fingers, which are on hands, which can often be moved to more superior positions fo naging between the knee and heart/T-spine, or kept fully extended, well inferior of isocenter for C-spine or brai naging, moving them out of the volume of RF deposition for that study. Movement of the hands out of the olume of RF deposition has the added benefit of having the hands well away from the region of interest, minishing any potential artifact risks as well.

itigation

imaging anatomy other than hands and hands can't be moved >30 cm superior or inferior of image center, such while imaging the elbow, it is recommended to remove the nail polish. As an alternative approach, one could ove the MRI patient's hands toward midline. RF energy in the ~60-cm body coil volume is transmitted from ehind the bore walls/ceiling, and anatomy further from the walls (i.e., closer to midline of the MR bore) will ceive significantly less incident RF and will be less likely to heat. Heating risks may also be mitigated through e use of cold compresses.

rtifact

hen imaging other body parts (not hands), simply make sure that the hands with the nail polish aren't close to e region of interest.

imaging hands or wrist, it would be advisable to remove the metallic nail polish due to possible artifacts and egradation of image quality.

nclusion

th the exception of imaging of the hand or other anatomy close to fingers with metallic nail
ish, there are many risk-mitigating approaches individual MRI providers can take apart from
noving the polish. In fact, for most patients/exams, indications to remove the polish as a
requisite for MRI imaging are made irrelevant by simply having the patient move their hand
from the volume of RF deposition. The presence of metallic nail polish products should not
automatic MRI safety exclusion criteria for patients seeking MRI exams.

s Seitz has been an MRI technologist for over 30 years and is currently an instructor in the diography program at The Ohio State University. Kris is certified in radiography, computed nography, and magnetic resonance Imaging by the ARRT and as an MR Safety Officer (MRS the International Board of Magnetic Resonance Safety (IBMRS). She also serves on the Boa Directors of the IBMRS and the Ohio Society of Radiologic Technologists. Kris has authored icles on MR and MR safety for ASRT Scanner and Radiologic Technology.

nias "Toby" Gilk is the founder of Gilk Radiology Consulting and co-host of The Invisible Fo dcast on the AuntMinnie Podcast Network. An architect by training, he has spent over 20 yea using on MRI safety, initially through the architecture and planning of MRI facilities, but wing into the technology, clinical practice, regulation, and economics of MRI safety. Gilk ds both MR Safety Officer (MRSO) and MR Safety Expert (MRSE) certifications from the erican Board of Magnetic Resonance Safety (ABMRS). An evaluator of serious reportable nts (SRE), he is also a volunteer member of the Technical Expert Panel (TEP) of the Nationa ality Forum, and co-author of "The Technologist MRI Safety Handbook."

e comments and observations expressed are those of the author and do not necessarily reflec opinions of AuntMinnie.com.

New — FSA/HSA eligible

BodyFit

Segmental body composition scale

Compatible with IOS 16+ & Android 10.0+

Precise weight measurements
Consistent and precise weight measurements (up to 50g)

Segmental body composition
Ultra precise measurements of your body composition plus fat and muscle mass for each body part independently (6 zones)

Metabolic assessment
Visceral Fat Index, and BMR (Basal Metabolic Rate)
BodyPath and Body Profile*

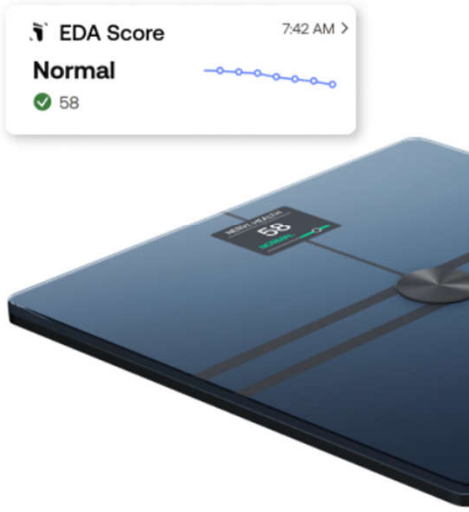
Heart health
Indication of your cardiovascular health via Vascular Age, Pulse Wave Velocity and standing heart rate

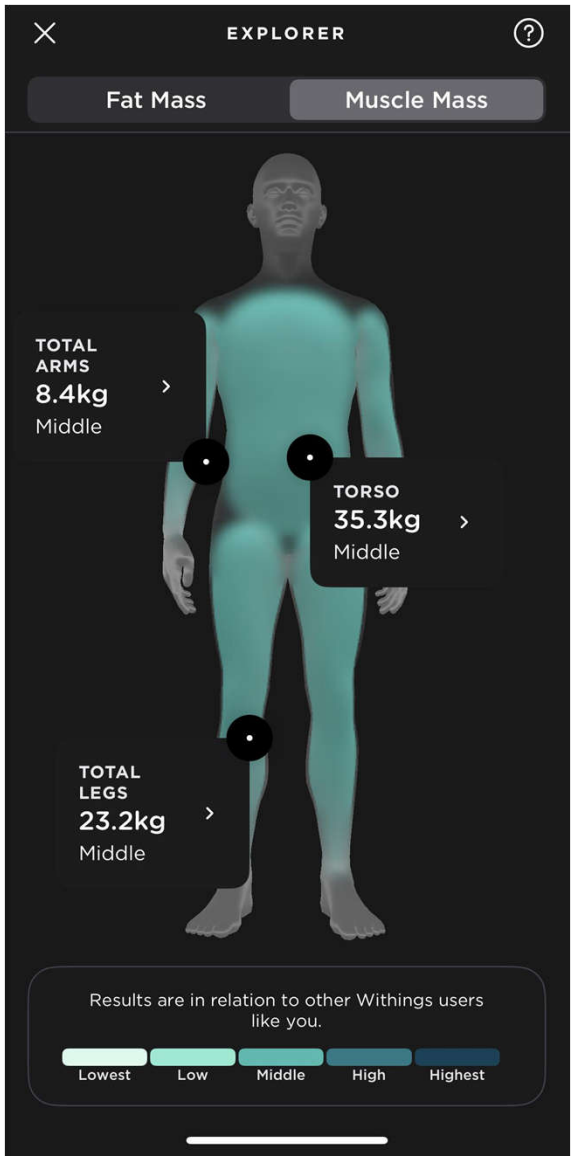
Daily weather forecast
Step on your scale to enjoy a localized weather report as well as an air quality analysis

Multi-user friendly
Recognizes and tracks up to 8 users independently. Various modes available, including Athlete and Baby. Eyes Closed Mode and Pregnancy Mode will be enabled shortly.

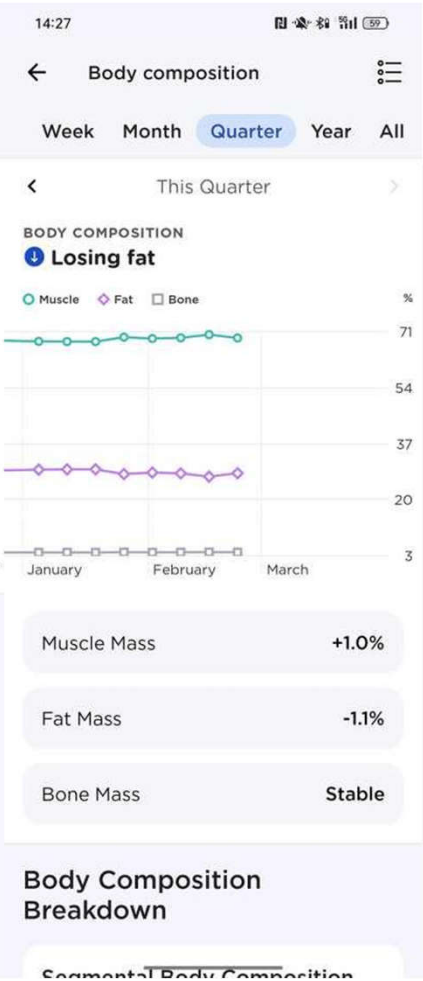
Installation and synchronization
Wi-Fi is required to set up your scale and automatically sync every weigh-in to the Withings App. Bluetooth support is coming soon.

Electrodermal activity assess
the sweat gland activity in yo
feet, which can help manage
overall health.

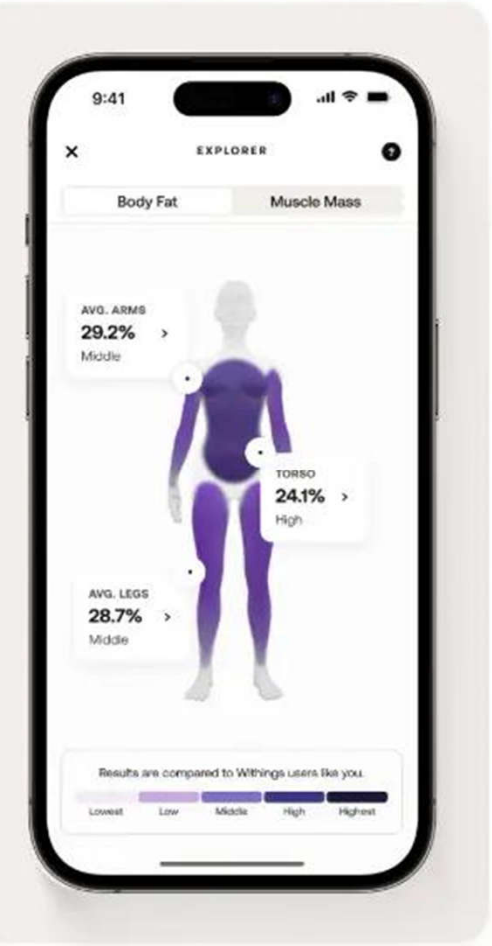


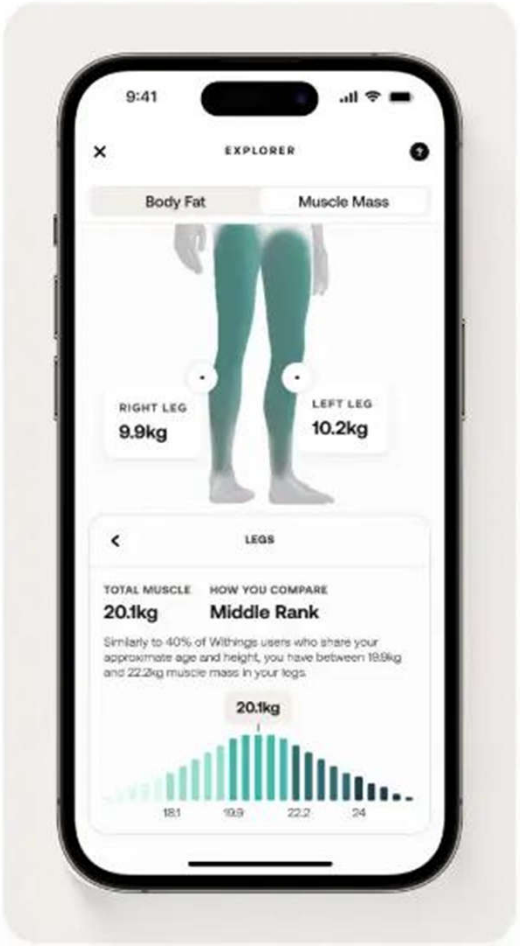

EXPLORER
Fat Mass
Muscle Mass
TOTAL ARMS
8.4kg
Middle
TORSO
35.3kg
Middle
TOTAL LEGS
23.2kg
Middle
Results are in relation to other Withings users like you.
Lowest
Low
Middle
High
Highest


14:27
Weight
Week
Month
Quarter
Year
All
This Month
WEIGHT
Losing Weight
kg
102
99
96
93
Mon 06
Mon 13
Mon 20
Mon 27
Weight Breakdown
Body Mass Index
RESULT
Overweight
TREND
-0.7
BMI
36
31


14:27
Body composition
Week
Month
Quarter
Year
All
This Quarter
BODY COMPOSITION
Losing fat
Muscle
Fat
Bone
kg
%
102
99
96
93
71
54
37
20
3
January
February
March
Muscle Mass
+1.0%
Fat Mass
-1.1%
Bone Mass
Stable
Body Composition Breakdown

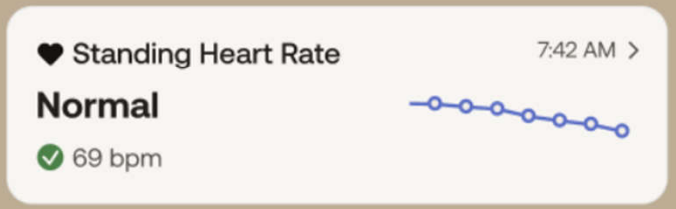

14:28
Explorer
Fat Mass
Muscle Mass
TOTAL ARMS
8.1 kg
High
TORSO
35.6 kg
High
TOTAL LEGS
22.9 kg
High
Results are in relation to other Withings users like you.
Lowest
Low
Middle
High
Highest

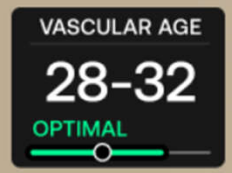




Get to know your arteries, strengthen your heart

Discover the true age of your arteries, monitor changes, and iden patterns that may be impacting your heart health.





Total Body Site Analysis

1. Total Body Scan Image

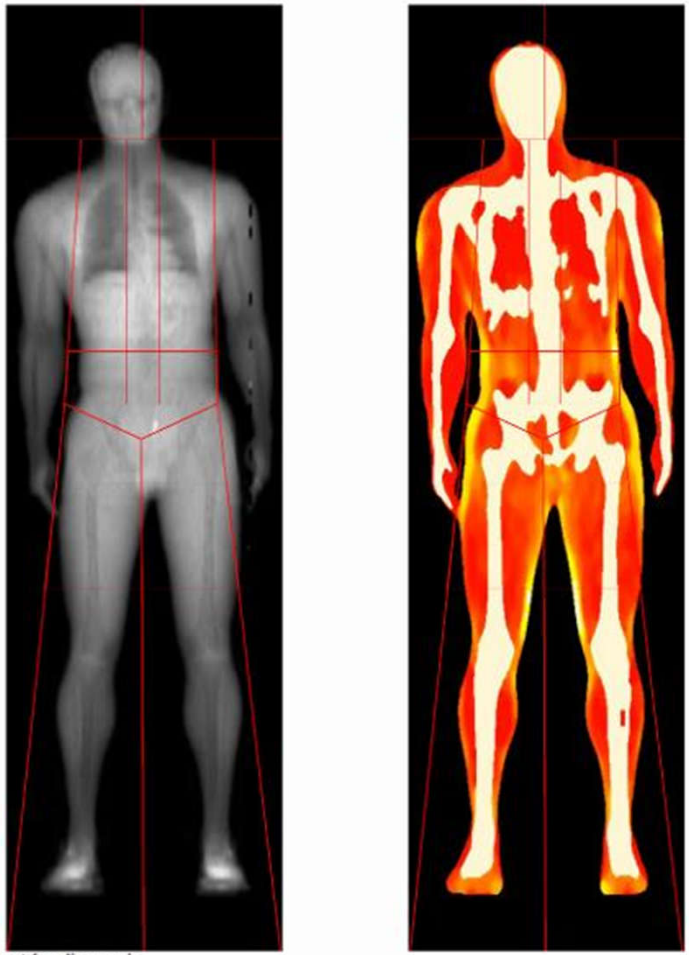


Image not for diagnosis

2. Total Body Composition

	Value	Soft Tissue	Body Weight
Total Lean Mass	59.7	70.4	72.9
Total Fat Mass	10.7		
Total Bone Mass	2.5		

3. Body Fat Analysis

TotalFAT(%)	14.7
VAT Mass (g)	132
VAT Volume (㎤)	143
VAT Area (㎠)	27
SAT Mass (g)	374
SAT + VAT Mass (g)	506
SAT/VAT Ratio	0.35
VAT (%) / SAT (%)	6 / 16

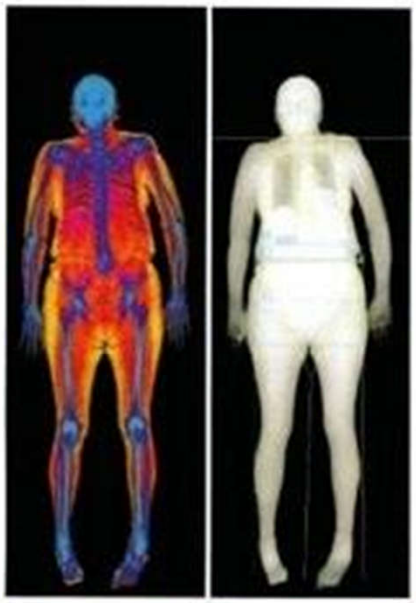
4. Body Lean Analysis

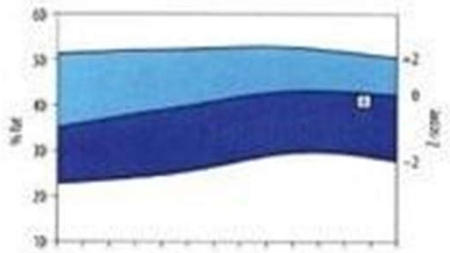
※ASM : Appendicular Skeletal Muscle Mass

Lean Body Mass	59.7
ASM/Height^2	10.7
ASM/Weight	0.5
ASM/BMI	1.4

5. BMI

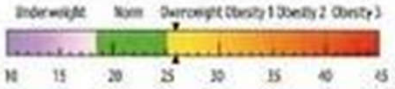
BMI : 23.5%





Classification of the body mass index according to the WHO

BMI – 25.9 WHO Classification Overweight



Fat Mean Bone

Results – body composition

ROI	Fat (g)	Mean + BMC (g)	Sum (g)	Fat %	Fat (%) TN	Fat (%) AM
L. arm	2698	2995	4693	57.5	98	94
R. arm	1832	2221	3354	54.6	90	85
Trunk	18317	18888	29224	62.7	61	19
L. leg	6240	5399	9639	64.7	65	37
R. leg	6250	5702	9995	62.5	57	29
Sum	34096	34206	58902	57.9	74	57
Head	1171	3245	4416	26.5		
Sum	35266	37451	63318	59.2	74	57
Android (A)	2952	2808	4860	60.7		
Gynoid (G)	3851	5131	8982	42.9		

Fat Indices

Measurement	Result	Percentile TN	Percentile AM
% of total body fat	46.9	74	57
Fat mass/height (kg/m²)	10.4	63	38
% Android fat / % Gynoid fat	0.98		
Trunk % fat / Legs % fat	0.93	57	31
Est. VAT Mass (g)	3654		
Est. VAT Volume (cm³)	3514		
Est. VAT Area (cm²)	179		

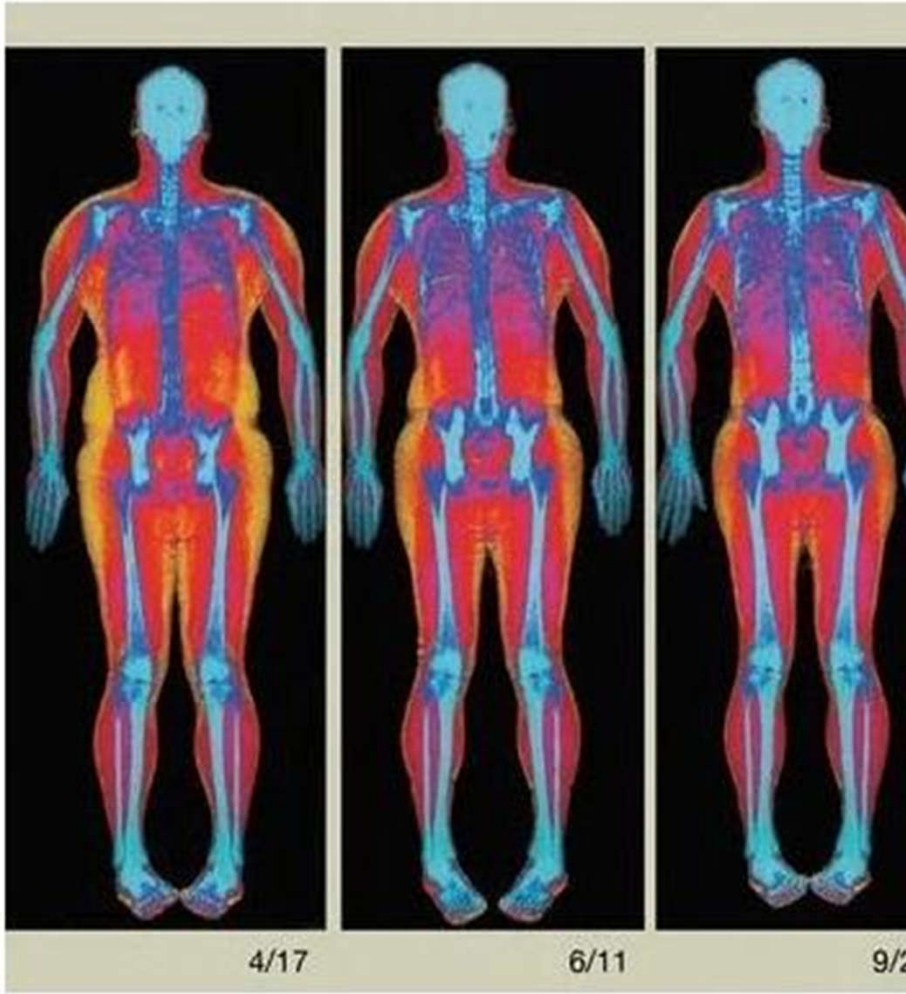
Lean Indices

Measurement	Result	Percentile TN	Percentile AM
Lean/Height² (kg/m²)	14.8	37	41
Appen. Lean/Height² (kg/m²)	5.34	26	42

Est. VAT = Estimated Visceral Adipose Tissue

HOLOGIC®

TBAR1209-NHANES BCA calibration




20:27
EXPLORER
Fettanteil
Muskelmasse
DURCHSCHNITT DER ARME
13,6%
Niedrig
TORSO
16,7%
Sehr niedrig
MITTELWERT DER BEINE
13,6%
Sehr niedrig
Die Ergebnisse stehen in Relation zu anderen Withings Nutzern wie Ihnen.
Sehr niedrig
Niedrig
Mittel
Hoch
Sehr hoch
20:27
EXPLORER
Fettanteil
Muskelmasse
ARME INSGESAMT
8,1kg
Mittel
TORSO
33,8kg
Mittel
BEINE INSGESAMT
21,8kg
Mittel
Die Ergebnisse stehen in Relation zu anderen Withings Nutzern wie Ihnen.
Sehr niedrig
Niedrig
Mittel
Hoch
Sehr hoch
20:27
EXPLORER
Fettanteil
Muskelmasse
RECHTES BEIN
10,7kg
LINKES BEIN
11,1kg
BEINE INSGESAMT
GESAMTMUSKELMASSE
21,8kg
MEIN ERGEBNIS VERGLEICHEN
Mittlerer Bereich
Vergleichbar mit 40% der Withings-Nutzer ähnlichen Alters und Körpergröße haben Sie zwischen 20,8kg und 23,2kg Muskelmasse an den Beinen.
21,8kg
19,0
20,8
23,2
25,1

Chỉ số	Withings BodyFit	DEXA
Cân nặng	✔	✔
% mỡ toàn thân	✔ (ước tính bằng BIA)	✔ (đo trực tiếp bằng tia X năng lượng kép)
Mỡ từng vùng	✔ (tay trái, tay phải, thân, bụng, chân trái, chân phải)	✔ (tay, chân, thân, android/gynoid, nhiều vùng chi tiết hơn)
Khối cơ từng vùng	✔	✔
Mỡ nội tạng	✔ (ước tính)	✔ (định lượng chính xác hơn trên một số hệ thống)
Nước cơ thể	✔	✘
Khối lượng xương (Bone Mass)	✔ (ước tính)	✔ (Bone Mineral Content - BMC)
Mật độ khoáng xương (BMD)	✘	✔
T-score / Z-score	✘	✔
Chẩn đoán loãng xương	✘	✔ **(tiêu chuẩn vàng)**

hings BodyFit

trung vào theo dõi sức khỏe hằng ngày.

n thị hình cơ thể với 6 vùng để xem phân bố mỡ và cơ.

biểu đồ xu hướng theo thời gian và mục tiêu giảm mỡ/tăng

thêm các chỉ số như nước cơ thể, tuổi chuyển hóa, nhịp tim, mạch máu.

DEXA

•Báo cáo mang tính lâm sàng.

•Hiển thị ảnh quét X-quang toàn thân cùng bảng số liệu chi t

•Có các chỉ số **Bone Mineral Density (BMD)**, **T-score**, **Z-score**, và phân tích vùng **android/gynoid**, **lean mass**, **fat m BMC**.

•Được sử dụng để chẩn đoán loãng xương và đánh giá thành phần cơ thể với độ chính xác cao.