

# Joint research outcomes.

プレスリリース

**慶應義塾大学**

報道関係者各位

2020年11月27日

慶應義塾大学医学部

**毎日1時間の水素吸入が自律神経のバランスを整え、降圧効果を発揮**

慶應義塾大学医学部内科学（循環器）教室の佐野元昭准教授、同大学医学部の小林英司特任教授、同医学部救急医学教室の多村知剛助教の研究グループは、日本救急生命科学大学救急医療看護学部の梅田倫二教授らとの共同研究により、毎日1時間の水素吸入に、高血圧モデルラットの血圧を下げる効果があることを証明しました。

これまで水素ガス治療開発センターでは、高い精度、再現性、ヒトへの外挿性（推定性）を有する実験動物モデルを開発し、ストレス反応に伴う身体の器質的あるいは機能的な障害を水素が予防あるいは軽減させることを報告してきました（※：関連文獻）。

さまざまなストレスによって交感神経が過度に活性化されると、血圧が上昇するだけでなく、脈が速くなります。この状態が長く続くとう動脈硬化が進行し、腎臓を流れる血流量が減少して尿をつくる能力が落ちるなど、臓器に対して直接的、悪い影響を与えます。高血圧の治療の目標は、臓器の障害を抑制して、脳卒中・循環器疾患を予防することにあります。そのためには、単に血圧を下げるだけでなく、交感神経の過度な活性化の抑制を介して降圧させる治療戦略こそがより理想的であると考えられます。

(Nov. 2020)  
Keio University School of Medicine issued a press release on the results of research that "hydrogen inhalation balances the autonomic nervous system and exerts a blood pressure lowering effect."



Inhaling water for 1 hour every day balances the **autonomic nervous system** and exerts an **antihypertensive effect**.

プレスリリース

**慶應義塾大学**

報道関係者各位

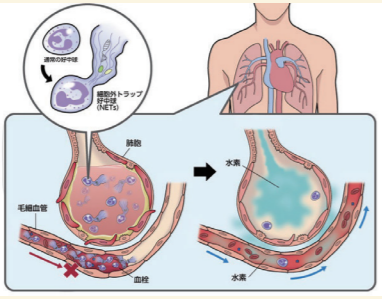
2022年1月14日

慶應義塾大学医学部

**水素は活性化した好中球のNETs産生を抑制し炎症反応を改善する**

慶應義塾大学医学部内科学教室（循環器）の山本公高助教授と佐野元昭准教授と小林英司特任教授の研究グループは、慶應義塾大学グローバルイノベーションセンター水素ガス治療開発センターの協力を得て、水素が Myeloperoxidase (MPO) や Myeloperoxidase-DNA complex (MPO-DNA complex) など、好中球由来の網膜状血栓（Neutrophil Extracellular Traps, NETs）の産生を抑制することを明らかにしました（※1）。さらに、マウスおよび人間のイテラグラフ（※2）により好中球（LPMs: Lipopolysaccharide）で白血球を活性化させた際に、水素吸入が好中球からNETsの産生を抑制することを確認しました。NETsは、細胞内に存在したDNAやミトコンドリア、細菌の細胞中に存在した好中球顆粒状物質、ミコペルオキシダーゼなどの蛋白質が結合した構造物で、網膜内に放出されたNETsは、網膜細胞に対して物理的障害や化学的障害を及ぼすことが知られていますが、適切な治療による長寿命化が期待されています。

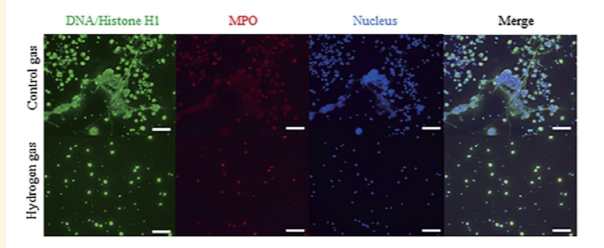
中国・武漢では、新型コロナウイルス肺炎の治療に水素吸入が採用され、重症化予防に一定の効果があったことが報告されました。一方、新型コロナウイルス感染症による重症化の予防に水素吸入が有効であることが期待されています。



(Jan. 2022)  
Keio University School of Medicine issued a press release stating that "hydrogen has the effect of suppressing the production of neutrophil NETs and reducing inflammation."



Hydrogen suppresses the production of neutrophil NETs, and exhibits anti-inflammatory, alveolar-protective, and **antithrombotic effects**.



Above shows that hydrogen gas clearly inhibits thrombus formation compared to control gas.

It is being introduced to medical institutions, treatment clinics, and nursing care facilities as a self-pay medical treatment and as a welfare program for staff.



Obtained evidence of blood hydrogen concentration at the level of advanced medical care

# Hydrogen Inhaler H2J11



Target concentration in the treatment area  
**Achieved blood hydrogen saturation concentration of 2.0%.**

**Can operated 24 hours, 365 day non stop**

**Industry's Highest Durability**  
Hydrogen generating device lifetime of 50,000 hours.

Correct hydrogen inhalation based on scientific evidence.

**Expected effects of hydrogen based on reports.**

- Anti-oxidant
- Anti-inflammation
- .Anti-allegy

|                     |                              |
|---------------------|------------------------------|
| Model               | H2J1                         |
| Purity              | 99.999%+                     |
| Flow                | 250ml/min                    |
| Min supply pressure | 700kPa                       |
| Power consumption   | 140W                         |
| Rated voltage       | AC100V 50/60Hz               |
| Set up environment  | Temp 15-35°C, Humidity 0-80% |
| Tank capacity       | 2.5L                         |
| Dimension           | W230mm x D370mm x H4480mm    |
| Weight              | 13kg                         |

ご紹介動画はこちら



For inquiry

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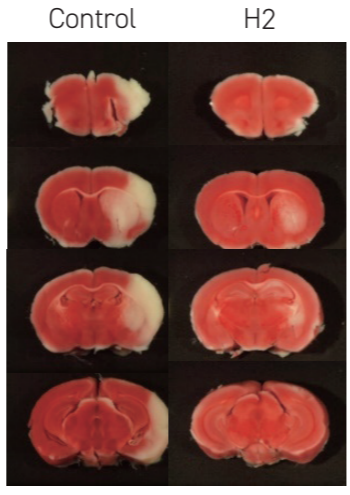
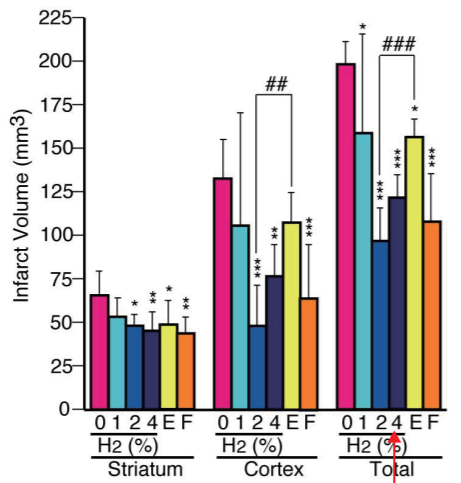
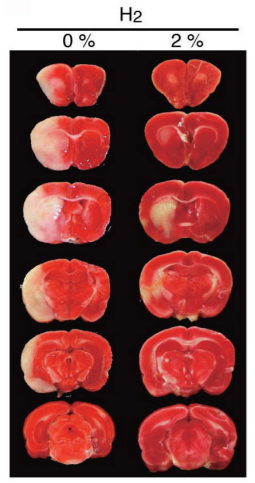
メーカー希望小売価格 2,200,000円(税別) / 2,420,000円(税込)

# Correct hydrogen inhalation means achieving the correct blood hydrogen concentration in the therapeutic area.

A paper published in Nature Medicine in 2007 drew attention to the 2.0% concentration of hydrogen in the blood, along with its antioxidant power, and research was initiated worldwide.

## [Acute cerebral infarction model study (non-clinical) 2008 / 2012]

Presented a cerebral infarction size suppression effect at a blood hydrogen concentration of 2.0%.



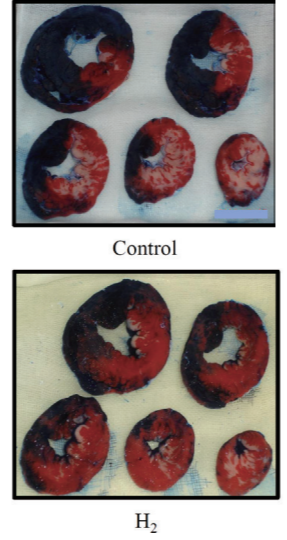
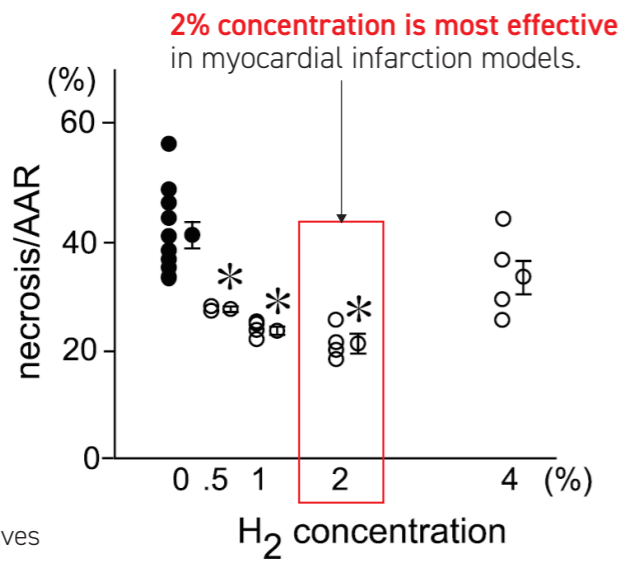
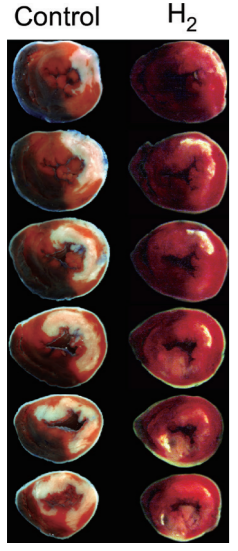
Hydrogen gas inhalation halves cerebral infarction size

At the Total value, a blood hydrogen concentration of 2% is most effective.

Reproducibility testing by Keio University School of Medicine also halved infarct size in the hydrogen group.

## Acute myocardial infarction model study (non-clinical) 2008/2012

Published effect of 2.0% blood hydrogen concentration on myocardial infarction size reduction.

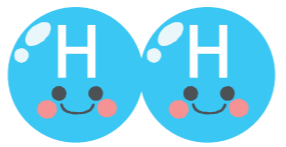


Hydrogen gas inhalation halves myocardial infarction size.

Myocardial infarction size also halved in a trial conducted by the National Cardiovascular Centre.

## Target Concentration

A blood hydrogen concentration of 2.0% is the concentration at which therapeutic effects have been reported in many cases of cerebral infarction, myocardial infarction and cardiopulmonary arrest syndrome, based on the results of previous non-clinical and clinical studies. It is important to inhale the correct amount of hydrogen, as either too little or too much can cause a difference in effectiveness.

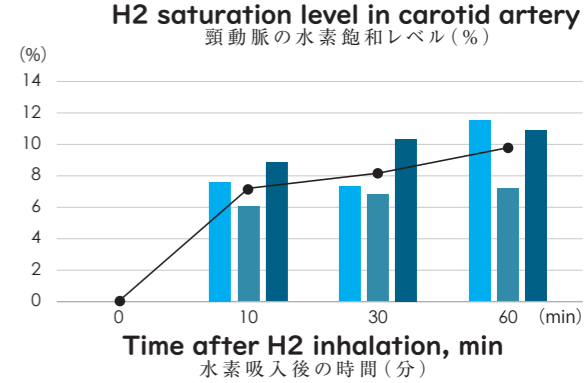
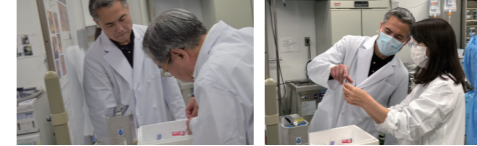
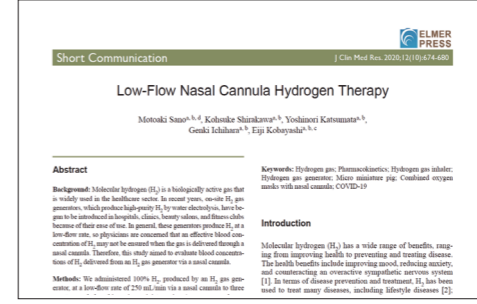


# Hydrogen inhaler that can maintain adequate blood hydrogen levels H2JI1



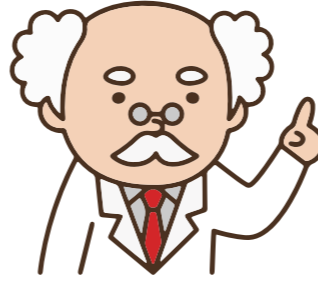
Obtaining pharmacokinetic evidence Hydrogen inhaler with scientifically proven blood hydrogen concentration of 2.0%.

Based on joint research with Keio University School of Medicine / article information published in the medical journal ELMER PRESS



It is the first product in the world reported in a paper to increase blood hydrogen levels to sufficient levels to have a reported therapeutic effect.

Of the many hydrogen inhalers available, this is the only product that has obtained blood hydrogen concentration evidence. \*2022年3月1日現在



It takes only 10 minutes after inhalation to reach the target concentration of 2.0% hydrogen saturation in the blood.



## Q&A Frequently asked questions

**Why 100% hydrogen instead of hydrogen + oxygen mixed gas?**

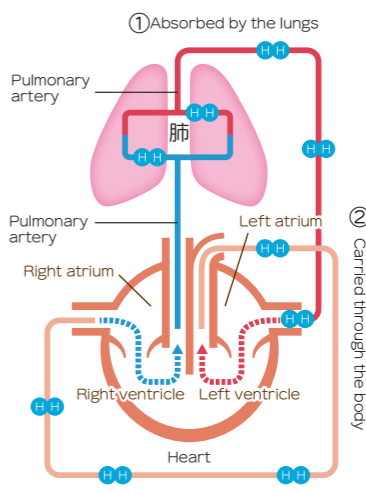
Oxygen intake above the required level causes oxidative damage to the lungs. Oxygen must be concentration controlled as a therapeutic gas. If oxygen inhalation is required, an oxygen mask can be fitted over the top while the patient breathes hydrogen through the machine.

**How long should I inhale for?**

It has been confirmed that the unit reaches a blood hydrogen concentration of 2.0% within 10 minutes after the start of hydrogen inhalation. We recommend at least 15 minutes of inhalation to experience the effect.

The unit is designed to maintain a blood hydrogen concentration of 2.0-2.5% even when continuously inhaled for extended periods of time.

**Does hydrogen really travel throughout the body?**



Inhaled hydrogen has been shown to be transported from the lungs to the heart and then through the arteries to the rest of the body.

Hydrogen also easily passes the blood-brain barrier and reaches the brain. Clinical trials are being conducted to protect brain cells in cardiopulmonary arrest syndrome. (Advanced medical treatment B approved).

It is pharmacokinetic evidence and does not guarantee efficacy or effectiveness in the human body.