PINS

VNS Therapy

Vagus Nerve Stimulation

Comprehensively improve the quality of life, a new hope for patients with drug resistant epilepsy (DRE)

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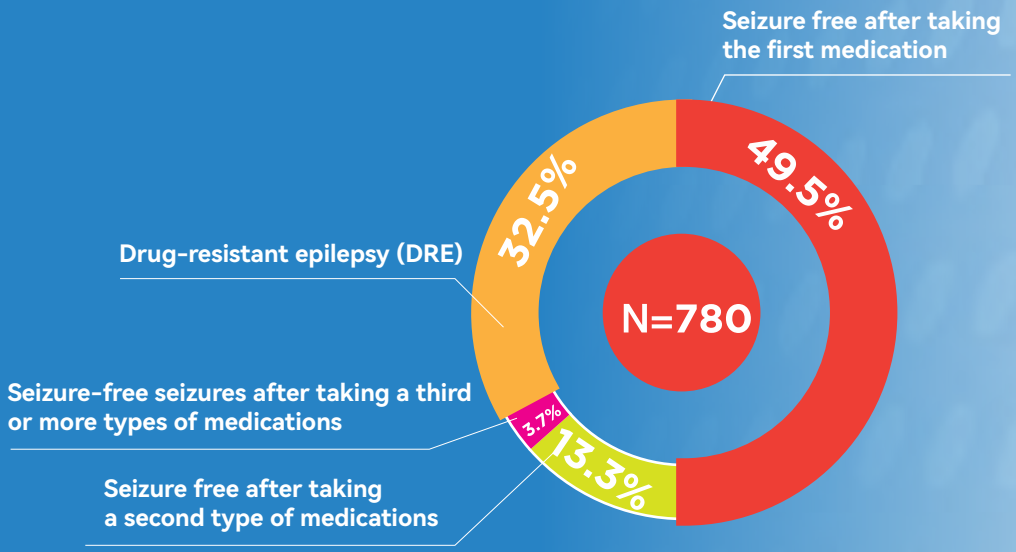
Comprehensively improve the quality of life, a new hope for patients with refractory epilepsy.

Is your epilepsy refractory?

Globally, an estimated 5 million people are diagnosed with epilepsy each year. Despite the continuous development and progress of anti-epileptic drugs, one-third of patients still cannot achieve seizure free after drug treatment, which is called refractory epilepsy.



Brodie, MJ. Epilepsia 2013; 54 (Suppl. S2):5-8

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Serious consequences of DRE

▶ Effects of frequent attacks

1 Injuries caused by seizures

2 Frequent visits to the hospital

3 Status epilepticus

4 Sudden Unexpected Death in Epilepsy

▶ Other comorbidities

ADHD

Autism

Anxiety

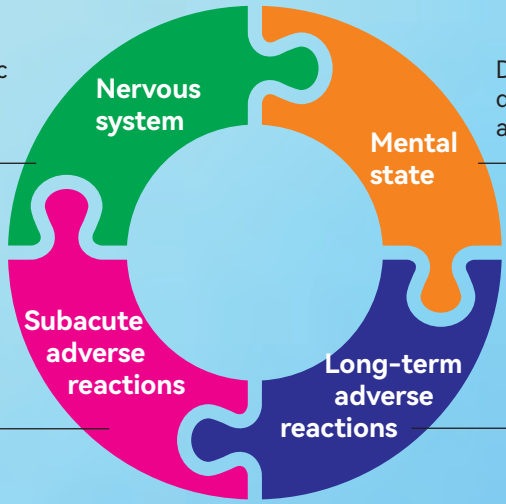
Sleep disorder

Headache

Depression

Adverse effects of long-term use of antiepileptic drugs

Neurocognitive and psychiatric symptoms such as dizziness, headache, and blurred vision



Depression, anxiety, fatigue, irritability, difficulty concentrating, mood swings, and a few cases of psychosis

Maculopapular rash, gastrointestinal symptoms

Effects on metabolism, blood biochemistry, immune and other systems

80% of patients will experience adverse reactions, and 30-40% of patients will discontinue treatment or have poor compliance due to serious adverse reactions that affect their quality of life or intolerance.

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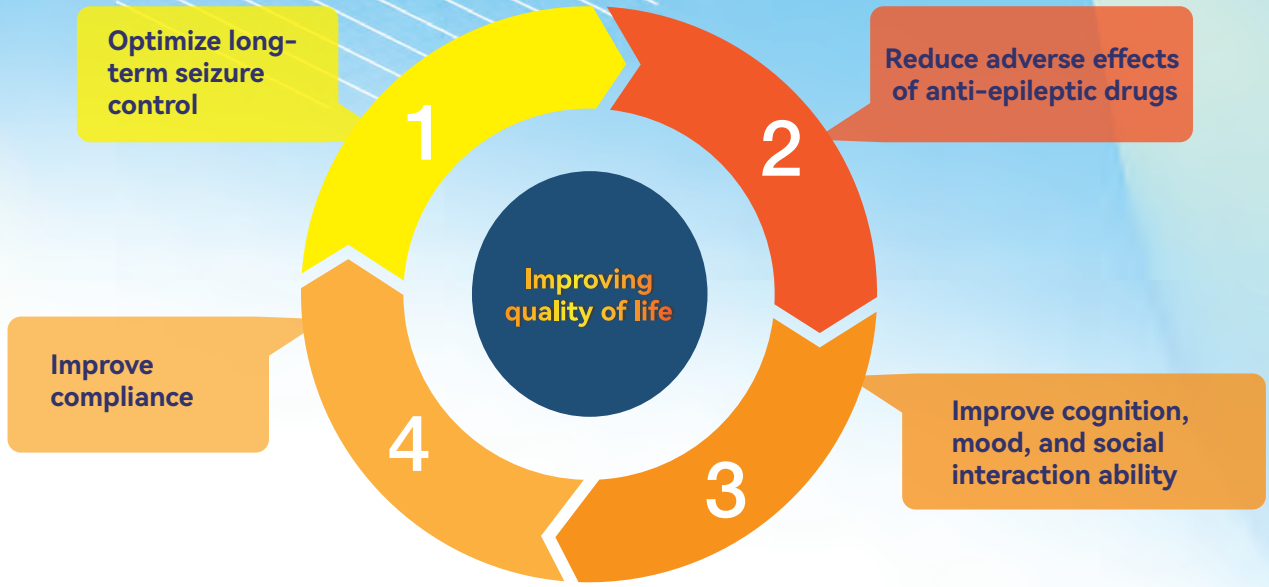
The treatment of refractory epilepsy is not just about controlling seizures



VNS Therapy - Improving quality of life

VNS, electronic drug: it stimulates the vagus nerve through micro-current and regulate the brain network, thereby controlling the onset of drug-refractory epilepsy, improving comorbidities of epilepsy, and comprehensively improving the quality of life of patients.

- **Minimally invasive surgery, no nerve damage**
- **Achieving therapeutic effects through neural network regulation**

A management process similar to traditional medicines

	Anti-epileptic drugs	VNS
Long-term management	✓	✓
Dosage adjustment	✓	✓
Medication regularity	✓ Easy to forget to take medicine or take wrong medicine	✓ Automatic stimulation, regular drug administration

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A different way of dosing

Surgery is just the first step,
Long-term management and continuous adjustment of drug dosage
are the keys to achieving better results in VNS treatment.

Minimally invasive surgery without craniotomy
The operation takes **1-2** hours, and the patient can be discharged from the hospital **2-3** days after the operation

Automatically stimulate the vagus nerve according to preset parameters

Safe and reliable

Post-operative programming

A professional program-controlled doctor will adjust the stimulation current intensity, stimulation time and other parameters regularly and multiple times based on the patient's seizure status, condition improvement, and tolerance to achieve the optimal "dose" of VNS therapy.

Expected results of programming

Optimize seizure treatment effects

Focus on improving comorbid diseases

Comprehensively improve quality of life

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Remote Programming

PINS VNS uses advanced remote programming technology to provide great convenience for VNS surgery patients, allowing patients to test whether the device is working properly and adjust stimulation parameters without leaving home, so as to achieve better therapeutic effects. Doctors can communicate with patients online through video, inquire about the efficacy, and formulate the best personalized treatment plan.

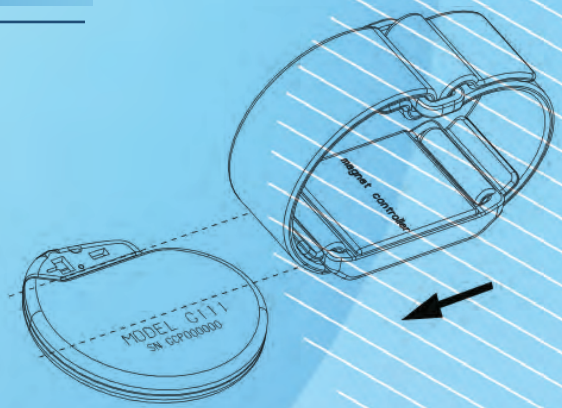
	Remote Programming	Traditional Programming
Result	Same	
Cost	Low	High
Efficacy	High	Low
Escort cost	Low	High
Disease management	Accurate	Complex

Doctor Patient

VNS Magnet

When patients feel a warning sign of an attack, they can use an external magnet to sweep across their chest, which allows the device to generate additional stimulation and help better control the attack.

- Terminate epileptic seizures
- Reduce the severity of attacks
- Shorten the recovery period after an attack



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The efficacy of VNS - Controlling epileptic seizures

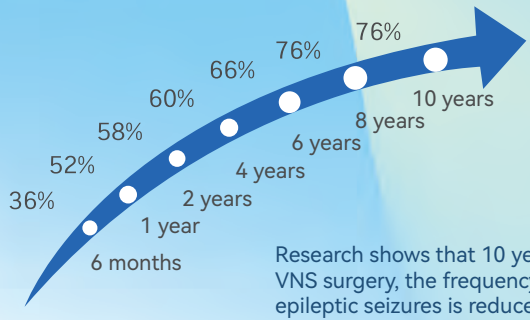
For DRE patient, VNS is as effective as anti-epileptic drugs in controlling epileptic seizures

AED	VNS	
Add a fourth drug Improvement < 1%	8%	4 years after implantation
	....	Effectiveness increases over time
Add a third drug Improvement 4.4%	4%	1 year after implantation

Studies have shown that the seizure-free rate of patients with refractory epilepsy is less than **1%** after receiving the fourth single drug; and 4 years after VNS implantation, about **8%** of patients have complete seizure control.

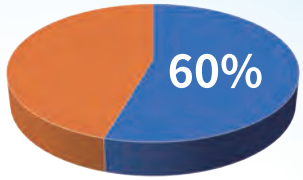
ZhibinChen, et al, JAMANeurology, 2017
Hernan F.J. Gonzalez, et al, Neurosurg Clin N Am, 2019

Effectiveness increases over time



Research shows that 10 years after VNS surgery, the frequency of epileptic seizures is reduced by 75.5%

About 60% of patients improved by more than 50% after surgery



60% of patients achieved effective improvement

Tatiana Von Hertwig Fernandes de Oliveira,et
Neuropsiquiatr,2017
Epilepsy and behavior, 2011

The efficacy of VNS - Improve comorbidities

Improve cognitive and behavioral abilities

Improve language, learning, memory and other abilities

Improve mood

Improve irritability, lethargy, hyperactivity, aggression and other behaviors

Morris GL, et al,J Neurology, 2013Philipp Spindler, et al, Seizure: European Journal of Epilepsy, 2019Alje van Hoorn, et al, Journal of Clinical Neuroscience, 2019

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What kind of patients are suitable for VNS?

Recommended by epilepsy experts:

Applicable to various types of refractory epilepsy

Recommended by epilepsy experts:

- Drug-resistant epilepsy that cannot be controlled after 1-2 years of combined medication according to international standards;
- Patients who failed surgical treatment;
- Intractable epilepsy that is not suitable for surgical resection of intracranial lesions.

迷走神经刺激术治疗癫痫的中国专家共识 中国医师杂志 2015 年

What kind of patients are suitable for VNS?

Types of epilepsy

Focal epilepsy

Focal to bilateral tonic-clonic epilepsy

General epilepsy (absence, atonia, tonic-clonic, clonic, tonic)

Epilepsy syndrome

Dravet syndrome

LGS

Childhood absence epilepsy

Juvenile absence epilepsy

Juvenile myoclonic epilepsy

Hereditary epilepsy

Comorbidities

Depression

Cognitive impairment

Migraine

Causes of epilepsy

Post traumatic injury

Tumor

Ischemia

Unknown cause

Tuberous sclerosis

Genetic

Infection

D ario J. E nglot, et al, J Neurosurg, 2011

James W. Wheless, et al, Epilepsy & Behavior, 2018

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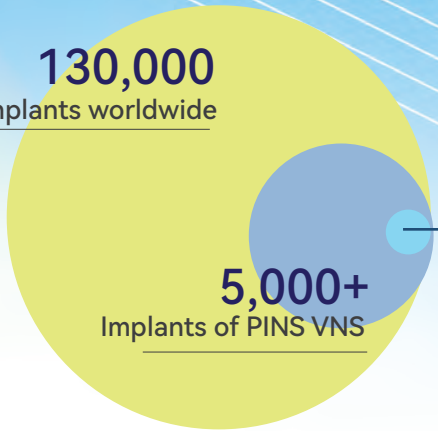
Safety of VNS



Few adverse reactions;

Minor adverse reactions such as coughing and hoarseness are usually transient and will gradually disappear over time.

Safe and reliable

Adjust dose according to seizure status

张建国，张凯，孟凡刚 . 迷走神经刺激术 [M]. 人民卫生出版社 .2019

PINS VNS is approved in 2016 in China and has been used in more than 200 centers worldwide

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About PINS

Since the first Chinese neuromodulation initiative of Tsinghua University in 2000, PINS Medical has gradually established a multinational corporation with headquarters located in Beijing, China, and international business center in Singapore. With an outstanding reputation as a high-tech health care corporation, PINS Medical has rapidly grown into a leader of the neuromodulation industry in China.

PINS Medical is an innovative medical company specializing in R&D, production, and sales of full-range neuromodulation products. Since the first NMPA approval of PINS DBS being granted in 2013, PINS Medical is now the first company in the world with four commercialized implantable neuromodulation product lines. In 2016, PINS Medical entered the international market with its first CE marked DBS system. By the end of 2021, PINS DBS, VNS and SNM systems have each accounted for more than 60% market share in China.

Together with medical institutes, research centers, companies, and top academic scientists, PINS Medical will continue to develop the latest cutting-edge therapies and bring them to patients as rapidly and affordably as possible.

PINS VNS Portfolio

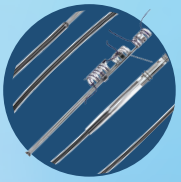
Implantable devices

G111
Implantable Pulse Generator

Height:	47mm
Width:	50mm
Thickness:	6.8mm
Weight:	23g
Battery lifespan:	10-11years
Battery capacity:	1850mAh

G112
Implantable Pulse Generator

Height:	36mm
Width:	42mm
Thickness:	6.8mm
Weight:	14g
Battery lifespan:	6-8years
Battery capacity:	980mAh



L311
Implantable Lead

Stimulation contacts:	2
Stimulation contact distance:	8.0mm
Inner diameter of contact helix:	2.0mm

External accessories

Control Magnet

Patient Controller - Model C702

Product Features:

◎ Remote programming ◎ User-friendly design

Patient Is No.1, alwayS

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