Medical Equipment & Devices in Japan

Japan Federation of Medical Devices Associations (JFMDA) http://www.jfmda.gr.jp

Contents

Ⅰ Characteristics of Japanese medical equipment and devices

The Japanese medical device industry contributes to the improvement of medical quality in Japan

Japan is known to have the longest life expectancy in the world and lifespans have grown in the past 60 years. The infant mortality rate in Japan is the lowest in G8 countries with 2.6 per population of 1000. What do these facts tell us? Are Japanese doctors unusually expert? Characteristics of healthcare in Japan are varied, such as universal health insurance coverage, uniformly high-quality medical services, and early detection of illnesses through checkup systems. We, JFMDA, strongly believe widespread use of top-of-the-line Japanese diagnostic and therapeutic devices to be the backbone of these features. The medical industry is one component of collaboration with the Japanese government, and healthcare workers provide people with a high level of healthcare not only in Japan, but also in many countries worldwide.

Japan has the longest life expectancy in the world

Life expectancy at birth (years)

	1950	2010
Male	60	80
Female	63	86

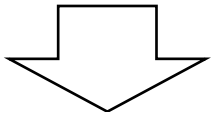
Sophisticated Japanese medical technology

The evolution of medical devices and equipment will lead to reduced physical strain on patients as well as cutting edge treatment times and costs, thus making healthcare more efficient and economical. We research and develop medical devices employing the superior industrial technology of Japan to meet this goal. Microfabrication, electronics and materials technologies are the areas that Japan is especially good at, which are used to devise new medical technologies such as high-accuracy diagnosis and less-invasive therapy and less-invasive interventions.

High accuracy diagnosis

Less-invasive therapy

Less-invasive interventions
(Interventional Cardiology & Radiology)



To contribute to medical care and
the people of the world

Ⅱ Medical Diagnostic Imaging Systems & Radiotherapy Systems in Japan

Cutting-edge digital image processing technologies and IT technologies as well as the evolution of highly regarded quality management systems are important factors enhancing reliability in medical diagnosis. Japanese medical manufacturers provide new clinical value by introducing various systems backed by high technology and stable quality and contribute to healthcare and social welfare around the world.

CT Description & features of Japanese technology

CT (Computed tomography)

CT is a diagnostic imaging system. It consists of a dome structure housing an array of X-ray tubes and opposed X-ray detectors which rotate around the patient's body. As it rotates, the array takes pictures, which are reconstructed by a computer into cross-sections of various organs of the body, color images in 3D, and other diagnostic images. With today's advances in computers and other technologies, these systems can gather a great number of images in a short time. Recent advances have enabled imaging of remarkably fine structures, as small as 0.5mm in diameter. Resulting displays include 3D images of blood vessels and internal organs as well virtual endoscopic displays of the large intestine, trachea and other luminal structures. These images are used to assist physicians in diagnosis at the treatment site, enable simulations before surgery, and for other vital applications.

CT was first developed in 1975 by EMI Central Research Laboratories in the United Kingdom. In August of that year, Toshiba Corporation, which had an ongoing partnership with EMI in its music and recording operations, imported the CT system to Japan. The history of CT scans in Japan began at this point. The system enabled physicians to detect brain tumors without performing craniotomy.

In 1990, Toshiba developed the world's first helical CT, enabling technicians to perform continuous imaging of patients along a corkscrew path while moving the bed. Thereafter, the New Energy and Industrial Technology Development Organization (NEDO) conducted two national development projects, a high-speed cone-beam 3D X-ray CT project and a real-time 4D imaging-system project. The results of these projects contributed to the advancement of a 256-row area detector in 2007, creating the world's first CT system capable of imaging a 16cm-wide area with a single pass, sufficient to cover the entire area of an adult heart, in just 0.35 seconds. Further advances by Toshiba included a 320-row area-detector CT system, capable of imaging entire organs ,such as the heart and brain, with a single pass. These innovations established Japan as a world leader in CT development.

CT system manufacturers in Japan:

Toshiba Medical Systems http://www.toshibamedicalsystems.com/
Hitachi Medical http://www.hitachi-medical.co.jp/english/

320 row area detector CT

MRI Description & features of Japanese technology

MRI (Magnetic resonance imaging)

MRI is a diagnostic system in which the patient is placed inside a detector embedded with large magnets.
The magnetic force from these magnets excites the hydrogen atoms in water that makes up 80% of the human body, generating radio waves. Coils placed around the patient's body detect these radio waves and convert them into images. Images of the internal organs in the vertical, horizontal and diagonal planes and cross-sectional images of blood vessels are captured, to diagnose blood flow and functional changes at the cellular level.

The principle of the magnetic-resonance phenomenon was first applied to medical diagnostic imaging systems in 1978, when EMI succeeded in using it to create an image of a human body. In 1982, Toshiba created the world's first commercial version of an MRI system, using normal conducting magnets. Japanese manufacturers are recognized as pioneers in the development of MRI systems.
A key feature of the MRI systems used in Japan is the reduced burden they place on the patient during examination. Toshiba developed a technology that reduces the clanging and humming noise of the magnets by placing them inside a vacuum chamber. An "open magnet" technology developed by Hitachi uses permanent magnets, enabling easy installation and providing the imaging technician with free access to the patient. To enable high-precision diagnosis of blood vessels, patients are sometimes injected with contrast medium; when problems of kidney blockage due to the contrast medium were reported in the United States, Toshiba developed the world's first system for vascular diagnosis without using contrast medium.
Western manufacturers later followed Toshiba's lead, and Japan's manufacturers of medical diagnostic imaging systems continue to focus on the development of systems that minimize patient discomfort.
As of 2013, Japanese manufacturers, who once trailed US and European manufacturers in this field, have completed their lineup of 3-Tesla high-magnetic-field MRI systems.

MRI system manufacturers in Japan:

Toshiba Medical Systems http://www.toshibamedicalsystems.com/
Hitachi Medical http://www.hitachi-medical.co.jp/english/

superconducting magnet MRI

open magnet MRI

US Description & features of Japanese technology

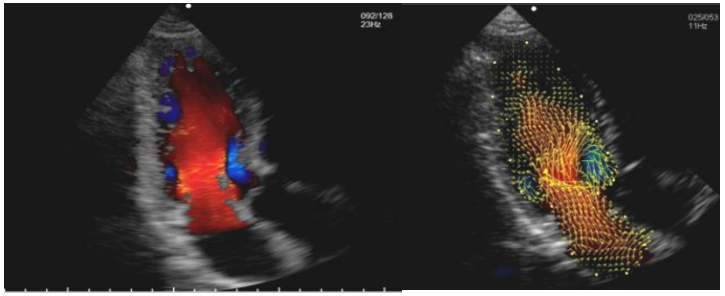
US (Diagnostic Ultrasound Systems)

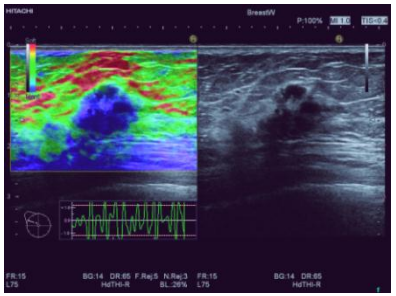
In ultrasound diagnostic systems, probes attached to the patient's body generate sound in the ultrasonic frequency and detectors capture these waves as they reflect off of organs, providing cross-sectional image data in real time. Applying a technology widely used in ship sonar and fish-finding systems, a wide range of ultrasound scanning methods are used in diagnosing disorders of the circulatory system and abdomen, obstetrical diagnosis and superficial diagnosis, among others. The range of medical diagnostic technologies developed using this technology is broad: Color Doppler examinations to render veins and arteries in color images for diagnosis; vascular ultrasound to detect hardening of the arteries; abdominal ultrasound, which is expected to enable diagnosis of the gastrointestinal tract in the near future; mammary ultrasound; and others. Ultrasound is a minimally invasive diagnostic technology.

Japan leads the world in electron-scanning ultrasound diagnostic systems using semiconductor technologies, with pioneering companies like Hitachi Aloka Medical, Ltd. and Toshiba making a strong showing in the global market. Many of these companies' products use unique technologies: Toshiba developed the world's only heart-muscle tracking system using 3D real-time imaging, and Hitachi Aloka created a technology called ultrasound mammary diagnostic elastography.

Ultrasound system manufacturers in Japan:

Hitachi Aloka Medical http://www.hitachi-aloka.co.jp/english/
Toshiba Medical Systems http://www.toshiba-medical.co.jp/tmd/english/
Fukuda Denshi http://www.fukuda.com/
Fujifilm http://www.fujifilm.com/products/medical/





ANGIO Description & features of Japanese technology

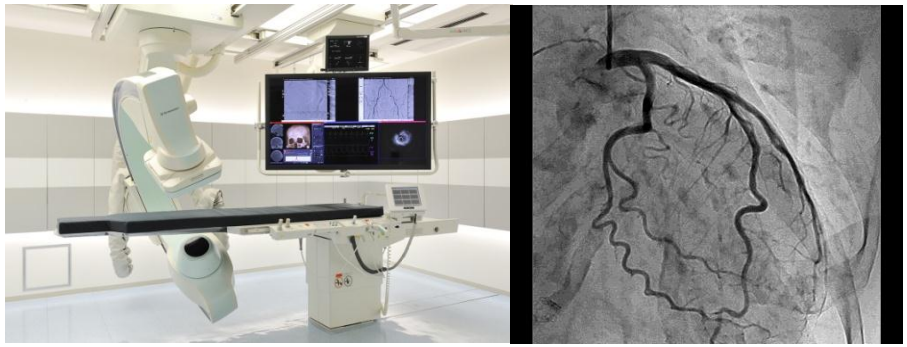
X-ray Angiography Systems

In X-ray angiography, a catheter (a tube about 1–2mm in diameter and 1m in length) is threaded from a blood vessel in the ankle, wrist or other such location to the area where imaging is required, such as the heart, head, abdomen or extremities. While the catheter is being inserted, the procedure is watched via X-ray images. A contrast medium is pumped in, to enable imaging and examination of the blood circulation and the condition of blood vessels. Interventional radiology (IVR) is a form of X-ray examination that includes percutaneous coronary intervention (PCI) and other angiogenetic treatments. In PCI, one or more stents (wire-mesh metal tubes) are placed in blood vessels, widening vessels that have become narrow and thus improving blood flow. This approach is a non-surgical procedure that is widely used as an alternative to conventional, invasive surgical procedures.

Recently, products have come to market that respond to the needs of specialists in cardiovascular surgery and cardiovascular internal medicine, promoting team work. These products adopt a hybrid approach, enabling installation in the operating room rather than in the x-ray imaging room. In this field, Toshiba has taken the lead, pursuing joint development in partnership with medical institutions in the United States.

X-ray angiography system manufacturers in Japan:

Toshiba Medical Systems http://www.toshibamedicalsystems.com/
Shimadzu http://www.shimadzu.com/products/medical/index.html



Shimadzu

TOSHIBA Hybrid ANGIO

General X-ray Description & features of Japanese technology

General X-ray CR (Computed Radiography)/DR (Digital Radiography)

General X-ray or plane radiography is the most fundamental and consistently used radiographic diagnosis in all hospitals. Digital systems for general X-rays are derived from screen-film systems. Now we have a full line-up including CR (Computed Radiography)/DR (Digital Radiography which uses a flat panel type detector) systems with the highest technology and highest image quality for each diagnostic purpose.

For cassette exposure, the CR system is suitable. We can utilize X-ray equipment which has already been installed in the hospital for digital imaging. For chest stand or bed type exposure, the DR system is most suitable. The cassette type DR is also useful for exposure such as in orthopedics or with mobile X-ray unit application. The Digital Mammography system is now a very strong tool for detecting breast cancer by visualizing small calcifications, etc.

CR was commercialized by Fujifilm in 1983 as the first digital general X-ray system in the world. Digital Mammography was commercialized in 2000 by GE for flat panel type DR and by Fujifilm for CR. To date, the Japanese X-ray system industry has been leading CR/DR and Digital Mammography system technology development. The Japanese digital general X-ray modality product will meet the global needs for high image quality, low X-ray dose and best fit usability.

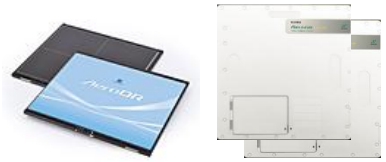
Digital General X-ray System Manufacturers in Japan:

Toshiba Medical Systems	http://www.toshibamedicalsystems.com/
Hitachi Medical	http://www.hitachi-medical.co.jp/english/
Shimadzu	http://www.shimadzu.com/products/medical/index.html
Canon	http://www.canon.com/technology/canon_tech/explanation/medical.html
Fujifilm	http://www.fujifilm.com/products/medical/
Konica Minolta	http://www.konicaminolta.com/selector/medical.html

CR

DR

Cassette type DR



Digital Mammography System

X-ray accessories for medical diagnosis

X-Ray accessories for medical imaging diagnosis

In Japan there are many manufacturers of X-ray accessories for medical imaging diagnosis. Some enjoy an impeccable reputation among medical professionals around the world.

X-ray Grid:

Mitaya Manufacturing Co., Ltd. http://www.mitaya.co.jp/

One of the leading global manufacturers of X-ray grids

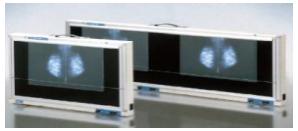
X-ray phantoms:

Kyoto Kagaku Co., Ltd. http://www.kyotokagaku.com

Leading manufacturer of radiology/medical imaging phantoms

Illuminator for X-ray film:

Orion Electric Co., Ltd. http://www.oriden.co.jp/engcatalog.html



Diagnostic Workstation for X-ray Mammography:

Climb Medical Systems, Inc. http://www.climb-ms.com/en/

Medical X-ray meters :

TORECK Co., Ltd. http://www.toreck.co.jp/english/medical/index.html

Lead free X-ray protection materials

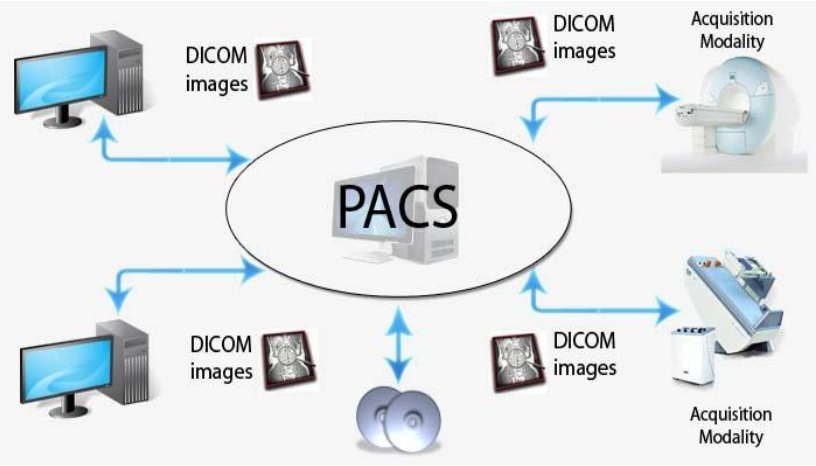
IKEN Engineering Co., Ltd http://www.iken-eng.co.jp/english/index.html

Offers total solutions for safe and reliable X-ray protections and exports lead free X-ray protection boards.

PACS Description & features of Japanese technology

Picture Archiving and Communication Systems (PACS)

X-ray, X-ray CT, MRI, Ultrasound, Positron emission tomography (PET), Single-photon-emission computer tomography (SPECT): medical examination technologies are diversifying rapidly. Today a wide range of diagnostic imaging systems are used on the front lines of medicine, each tailored to a different subject. As the resolution of these diagnostic imaging systems improves, the volume of data they capture increases, causing the amount of data that must be managed to grow rapidly. PACS is a system that efficiently stores and manages the vast quantity of data generated by diagnostic imaging systems. Originally developed without reference to networks, PACS was first intended only for storage. After 1995, when storage and transmission standards were unified in the United States under the DICOM standard, LAN and Internet technologies advanced. From 2000 onward, the spread and application of PACS skyrocketed.



Japanese PACS manufacturers have 25% of the total world market share.
One of the leading companies is Fujifilm using high-speed image-processing software and high-speed protocols. This PACS enables on-demand display of high-resolution X-ray, CT and other images, and is making a strong showing in the global market.
Other Japanese manufacturers are selling PACS products with their own unique capabilities. For example, Toshiba Medical is offering a PACS that works with cloud computing; Hitachi Medical is selling a next-generation PACS that provides a wide variety of high-quality services; and Konica Minolta, Inc.'s advanced PACS supports regional partnerships.

PACS manufacturers in Japan:

Fujifilm	http://www.fujifilm.com/products/medical/
Toshiba Medical Systems	http://www.toshibamedicalsystems.com/
Hitachi Medical	http://www.hitachi-medical.co.jp/english/
Konica Minolta	http://www.konicaminolta.com/selector/medical.html

Radiotherapy Systems

Ion-beam Radiotherapy Systems

Radiotherapy is known to be more effective than surgery in supporting the quality of life of patients undergoing cancer treatment. Today the new generation in radiotherapy is ion-beam radiotherapy. Using heavy-ion beams or proton beams, ion-beam radiotherapy irradiates the focus of the disease with pinpoint accuracy as compared with conventional X-ray and gamma-ray radiotherapy, providing a less invasive form of treatment.

Japanese manufacturers of heavy electrical machinery are now entering this field, leveraging expertise in particle accelerators and radiation control garnered from their operations in electrical-power systems. With advanced features such as irradiation tracking body movements, Japan's manufacturers are leading the global industry in ion-beam radiotherapy systems.

Ion-beam radiotherapy system manufacturers in Japan:

Mitsubishi Electric http://www.mitsubishielectric.com/bu/particlebeam/products/
Toshiba Corp. http://www.toshiba.co.jp/about/press/2013_08/pr0201.htm
Hitachi, Ltd. http://www.hitachi.com/rev/archive/2009/__icsFiles/afieldfile/2011/12/05/r2009_technology_pi.pdf
Sumitomo Heavy Industries http://www.shi.co.jp/english/products/medical/proton/index.html

Mitsubishi Electric

Toshiba Corp.

Hitachi, Ltd.

Sumitomo Heavy Industries, Ltd.

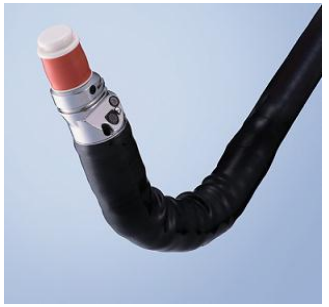
Video Endoscopy System

The first practical gastric camera was developed by a Japanese manufacturer. Japan leads in medical endoscope technology and has the largest market share in the gastroenterology field.

- An objective lens and an image sensor (mainly CCD) provided at the distal tip of an endoscope produce images for observation.
- An endoscope has a working channel that allows passage of therapeutic devices for tissue sampling, hemostasis, and other purposes.
- Practical applications of new technologies include:
  - Specific spectra observation that facilitates the detection of lesions.
  - Magnifying technique that allows direct observation of cellular changes.
  - A balloon-type endoscope that allows observation inside the small bowel which would otherwise be difficult to pass through.

Ultrasound Videoscope

Flexible ultrasound videoscope is a unique product developed in Japan.



- Ultrasound videoscope is equipped with an ultrasonic probe at the distal tip.
- It is used to detect lesions deep in organs.
- It is used to examine tumors such as those underneath the mucosa, esophageal varices, and bile duct stones.

http://www.olympus-global.com
http://www.fujifilm.com/products/medical/
http://www.pentaxmedical.com/

Surgical Endoscopy System

Japanese manufacturers supply surgical endoscopic systems including both flexible and rigid surgical endoscopes and other surgical devices (insufflator, electrosurgical devices, etc).

- Carbon dioxide (CO2) gas is supplied from an insufflator to insufflate the abdominal cavity and create a working space.
- Small incisions are made in the abdomen or chest to insert an endoscope, forceps, electrosurgical probes, etc, and to perform surgery under endoscopic view.

3D Laparoscopy System

World-first 3D surgical laparoscope with 4-directions deflectable tip: developed by a Japanese manufacturer and helps surgeons see and treat diseased parts.

- Endoscope capable of creating three-dimensional images
- Three-dimensional observation is considered to be effective in improving operative precision and reducing operation time.

http://www.olympus-global.com
http://www.fujifilm.com/products/medical/
http://www.pentaxmedical.com/

Synthesized 18 lead Electrocardiogram Identify Invisible Ischemia

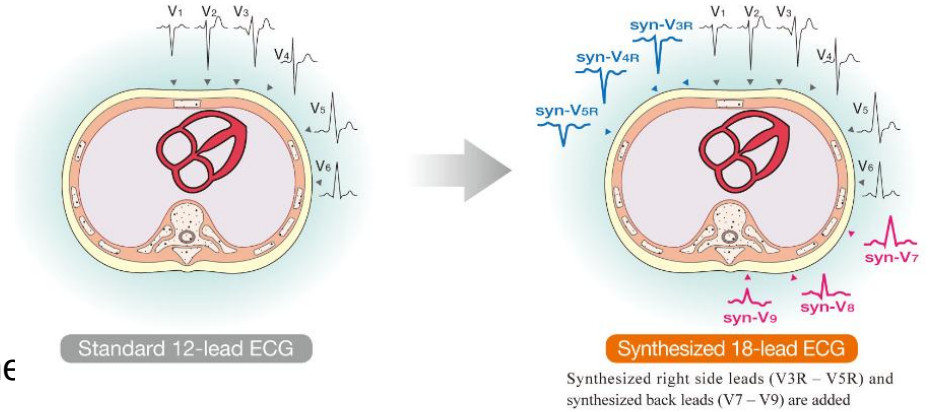
Synthesized 18-lead ECG derives waveforms of right chest leads (V3R, V4R, V5R) and back leads (V7, V8, V9) from standard 12-lead ECG data.

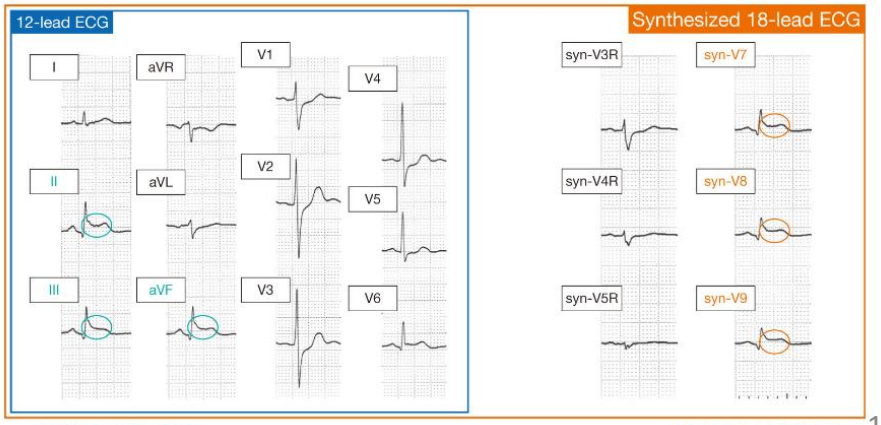
Limitations of standard 12 lead ECG
The standard 12-lead ECG is simple to use, has a low burden, and the heart can be observed from 12 directions. However, some areas, especially those with pathological change in the right ventricle and the posterior wall, cannot be observed using 12-lead ECG.

Usual procedure brings information from 6+ leads
To measure the right chest (V3R, V4R, V5R) and back (V7, V8, V9) areas, additional electrodes are necessary. Such additional procedures make the exam cumbersome.

With synthesized 18 lead ECG - “synECi18” technology, information from 6 additional leads can be obtained by the same procedure as standard 12 lead ECG.
The synECi18 uses the 12-lead ECG waveforms to mathematically derive the waveforms of the right chest leads (V3R, V4R, V5R) and back (V7, V8, V9).

(NIHON KOHDEN http://www.nihonkohden.com/)



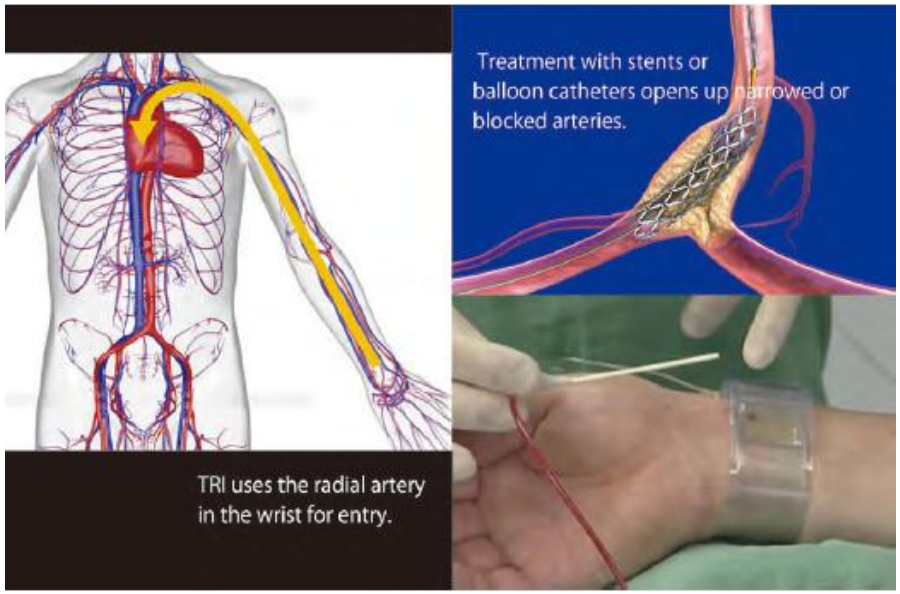


Ⅲ Therapeutic medical equipment and devices originally developed in Japan

The medical technology from Japanese high performance R&D and cutting-edge industrial technology are used in unique therapeutic medical devices. These are contributing to the improvement of medical treatment not only in Japan, but also many countries worldwide.

Medical technology of Japan has spread Transradial Intervention (TRI) worldwide

TRI is a percutaneous coronary intervention (PCI) procedure. In TRI, a catheter is inserted via the radial artery in the wrist to deliver stents to narrowed or occluded blood vessels such as coronary arteries. Conversely, catheters may be introduced via transfemoral intervention (TFI), that is, through an artery in the upper leg. Such TFI procedures were once the standard for this type of treatment. For cardiologists who have not trained at a hospital where radial access is practiced, Terumo offers many options for exposure to and training in radial access as a viable alternative to the current, customary use of femoral access. At the same time, however, continued development of balloon catheters and stents has enabled access through the smaller vessels in the wrist, or TRI. Compared to TFI, transradial intervention seems to place lower mental, physical, and economic burdens on patients. Through the comprehensive product line in the TRI field and training programs for physicians, Terumo contributed to promoting the spread of the TRI procedure around the world, which has led to this procedure becoming the new standard.



Features and Benefits

・Less invasive

The smaller diameter of wrist arteries means smaller incisions are required, and with TRI, patients can walk immediately after the procedure is finished, which should contribute to quicker recovery.

・Fewer complications

TRI procedures reduce the risk of internal bleeding and other complications.

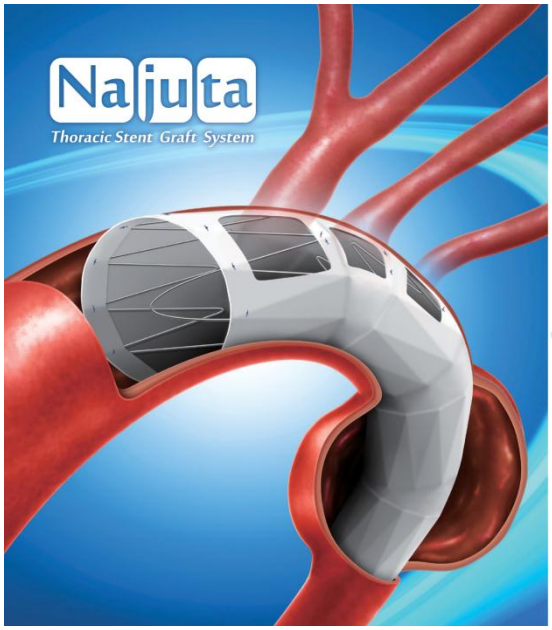
・Lower costs

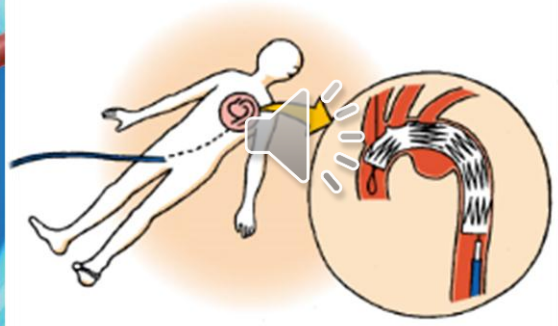
A shorter time in hospital means a lower economic burden on the patient.

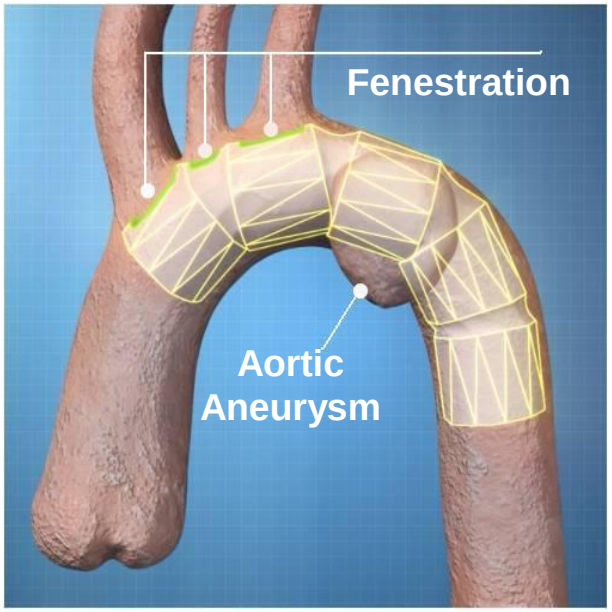
(TERUMO CORPORATION http://www.terumo.com/)

Thoracic Aortic Aneurysm Stent Graft

Stent Graft is a medical device, specifically an Endovascular Graft with a metallic spring used for the treatment of thoracic aortic aneurysms.
Delivery catheter, which has a Stent Graft inside, penetrates from the femoral artery and is placed at the area of the aortic aneurysm. Stent Graft prevents blood flowing into the aortic aneurysm and minimizes the risk of enlargement/rupture of an aortic aneurysm.







The newly invented Japanese product “Najuta” has fenestrations on grafts. Since these fenestrations will maintain blood flow to the artery that leads to the brain, Najuta can be used for patients with an aneurysm at the aortic arch.

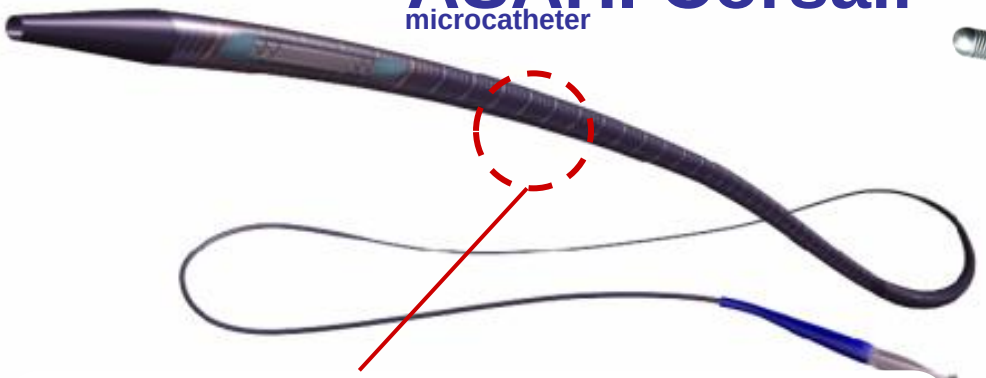
Najuta can provide these patients, whose only previous choice was a thoracotomy operation, an opportunity to undergo endovascular repair by using the Stent Graft.

KAWASUMI LABORATORIES, INC. http://www.kawasumi.jp/e/

Contribution to More Successful PCI (percutaneous coronary intervention)

Unlike other existing catheters, the Asahi Corsair can be advanced while simultaneously dilating a small vessel, as this catheter can be manually rotated.
By using the Asahi Corsair with our excellent, steerable ASAHI PTCA Guide Wires, more patients with occluded vessels can be treated than with conventional catheters.

ASAHI Corsair
microcatheter



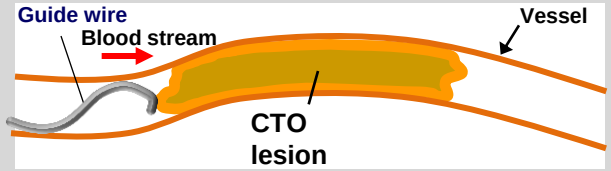
ASAHI PTCA Guide Wire
Miracle Series

One to one torque
conveys even a delicate rotary movement to the tip.

SHINKA-Shaft
employs our unique ACTONE (hi-torque flexible metal tube), which is not only flexible but also capable of transmitting torque to the tip, enabling accurate manipulation.

(ASAHI INTECC CO., LTD)
http://www.asahi-intecc.com/index.php

CTO（chronic total occlusion）
☐Hard calcified lesion
☐Total occlusion of vessel



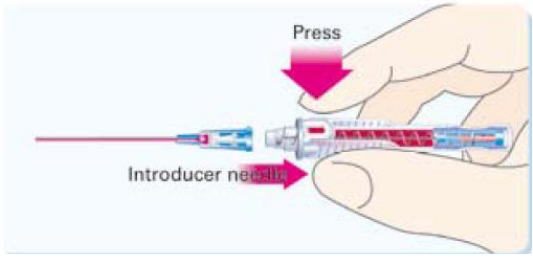
Safety Intravenous Catheter

Safety I.V. Catheter
Supercath™ 5

Patented Integral Check Valve

Designed to prevent blood exposure from catheter hub during venipuncture
Augments digital pressure to prevent blood spillage after withdrawal of the needle

Designed to protect from needle-stick injuries
Blood exposure protection from contaminated needles



Fully Encased Needle Protection

Intravenous catheter is an essential medical device and is used in various situations in the forefront of medicine such as fluid or blood infusion. In Japan, 120,000,000 of these catheters are used in a year.

In the case of continuous infusion, an IV catheter device such as Supercath from which the metal needle can be removed after blood vessel puncture is used, and the soft catheter is then placed in the blood vessel.

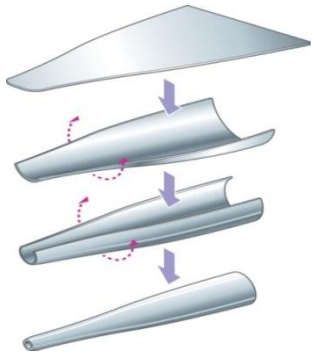
Supercath contains the catheter with hemostatic valve which our company first succeeded in mass producing. Additionally, the metal needle portion of this product has the needle stick prevention function. With this double safety mechanism, this product eliminates the potential of blood contact by healthcare workers, reduces the risks of needle-stick, in-hospital infection, and blood leakage in patients. (Medikit Co., Ltd.)

MEDIKIT http://www.medikit.co.jp/english/product/p1.html

Less pain for insulin injections with the world's thinnest needle

The World's Thinnest Pen Needle 34G (Ø 0.18mm)
The thinner an injection needle is, the less scarring and pain it causes. The diameter of the tip of "NANOPASS® 34" is only 0.18mm.

The World's First Double-tapered Needle
Under normal circumstances, the thinner a needle is, the greater its infusion resistance, however, with realization of the double-tapered structure, NANOPASS® 34 has gone beyond conventional metal-pressing technology.



Production process

Tip diameter
Ø 0.18mm 34G

- By making the external needle diameter smaller, "NANOPASS® 34" decreases the probability of touching pain receptors on the skin surface and reduces the pain of shots

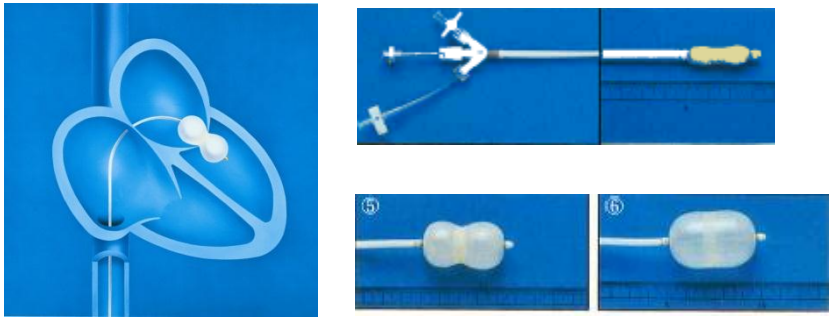
- "NANOPASS ® 34" can reduce both physical and mental strain of injection for diabetes patients, especially children who need self-injections daily

(TERUMO CORPORATION http://www.terumo.com/)

Extracorporeal Hemoperfusion Cartridge

"Toraymyxin" is the only approved treatment for severe sepsis and septic shock in Japan. This unique and innovative device is an extracorporeal hemoperfusion cartridge which is composed of polymyxin B covalently immobilized polystyrene derived fibers to remove endotoxin without side effects. This product is currently under evaluation for improvement of the survival rate in a clinical trial to obtain FDA approval in the US. "Toraymyxin" is expected to become the only approved treatment for severe sepsis and septic shock by the FDA worldwide.

Balloon Catheter for Percutaneous Mitral Commissurotomy



"Inoue-Balloon" is the world's first balloon catheter for percutaneous treatment of Mitral Stenosis. It provides a non-surgical, minimally invasive treatment option for Mitral Stenosis that is now considered to be the treatment of choice in anatomically suitable cases. The balloon shape that changes depending on injection volume simplifies the direction of the balloon to the mitral valve, assures proper positioning and prevents migration of the balloon. A rapid and smooth inflation/deflation cycle (within 5 seconds) quickly returns the valve to normal function. "Inoue-Balloon" is exported to over 90 countries worldwide.

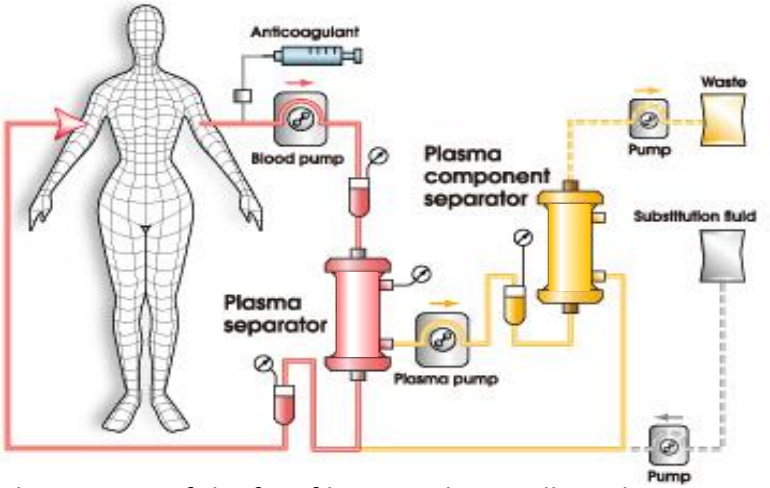
Toray Medical Co., Ltd. http://www.toray-medical.com/en/index.html

Double Filtration Plasmapheresis （DFPP）

-Technique pioneered in Japan-

Minimal albumin loss &
effective removal of target substances by selection of appropriate filter among the four different pore size models

Circuit diagram of DFPP



1. The large pores of the first filter membrane allow plasma, proteins and pathogens to pass through and into the second filter.
2. The second filter, with smaller pore size, selectively removes pathogenic substances from the plasma.
3. Substitution fluid may be added and the treated blood / plasma is then returned to the patient.
4. Removed plasma, containing pathogenic substances , is discarded.

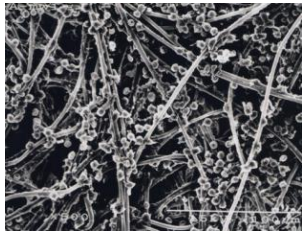
Leukocytapheresis Column （LCAP）

The world's first selective leukocyte removal filter with non-woven fabric for IBD (inflammatory bowel disease)

Features

- Innovative - LCAP therapy with leukocyte removal filter, selectively removes leukocytes (e.g. lymphocytes, granulocytes, monocytes), implicated in inflammation. This mechanism is considered key for improving patients' clinical status, along with inflammatory conditions.
- Easy - A simple extracorporeal procedure, which requires an approximately one hour per session. Standard treatment schedule requires 2 sessions/week for 5 weeks.

< SEM; Scanning Electron Micrograph pictures of leukocytes on the non-woven fabric >

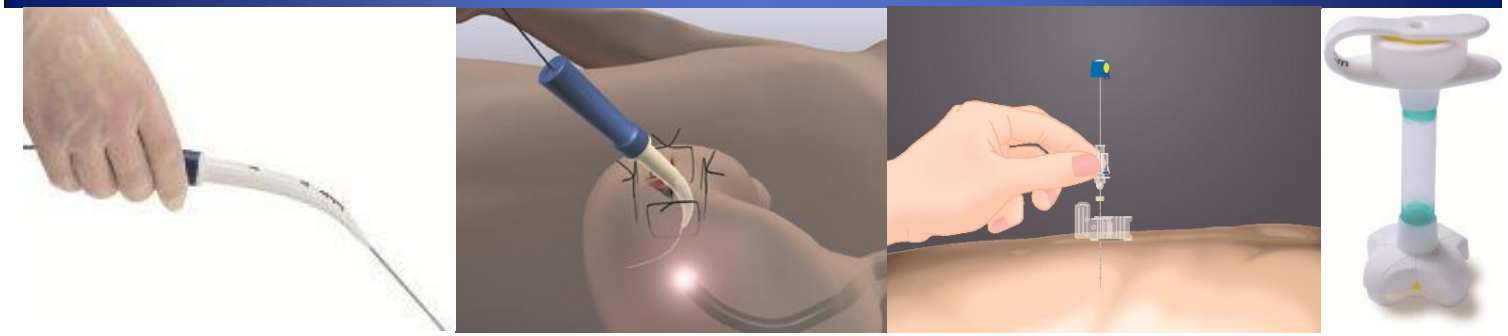


x200

URL： http://www.asahi-kasei.co.jp/medical/en/

Button Gastrostomy

Seldinger Percutaneous Endoscopic Gastrostomy Kit
~ Brand new PEG placement method using Seldinger technique ~



New operative procedure kit developed by a Japanese medical device manufacturer that allows minimally-invasive percutaneous placement of gastrostomy button, thereby increasing QOL for patients.

1. Differently from the conventional procedure of passing the gastrostomy button through anatomical structures (mouth, esophagus, gastrointestinal tract) colonized with bacteria and thus presenting a potential infection source, the new operative procedure allows direct percutaneous placement through the stomach wall and therefore reduces the risk of infection.
2. Usage of a small gauge puncture needle and hydrophilic-coated dilator with a blunt tip for direct stomach access requires only a small incision and minimizes wound size and bleeding.
3. The special shape of the bumper (of the gastrostomy button) reduced resistance during insertion while also effectively preventing accidental removal of the gastrostomy button.

http://www.covidien.co.jp/

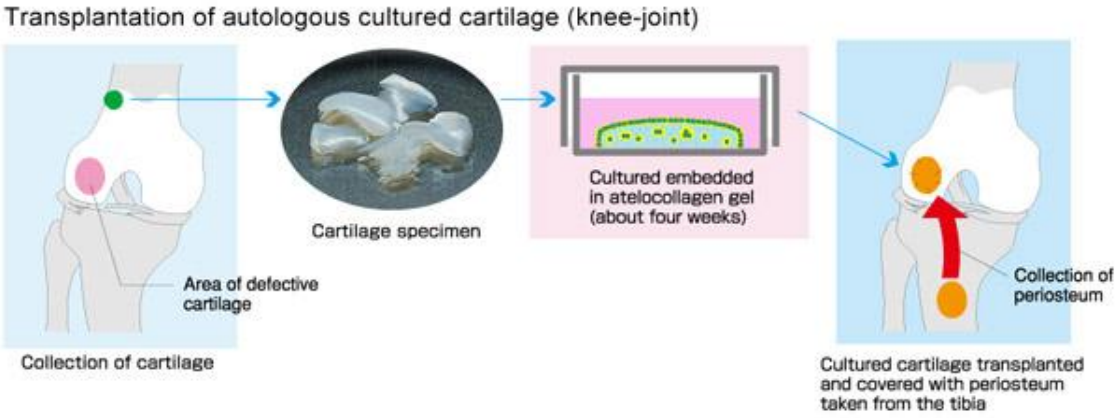
Autologous Cultured Cartilage

The treatment of damaged cartilage has long been one of the aims of orthopedic surgery. Professor Mitsuo Ochi of Hiroshima University has taken small amounts of cartilage from patients with cartilage damage and produced cultured cartilage, which is then implanted into the defective area. The therapeutic technique he established is known as autologous cultured cartilage transplantation. Japan Tissue Engineering Co., Ltd. (J-TEC) was quick to take notice of this method and obtained the guidance of Professor Ochi concerning his culture technique, in order to develop Japan's first ever cultured cartilage.

An orthopedic surgeon carries out minimally invasive arthroscopic surgery (keyhole surgery) to collect a small amount of cartilage from the knee. This cartilage is sent to J-TEC and cultured after having been mixed with atelocollagen gel and shaped into a three-dimensional form. During the culture period, which lasts about four weeks, the cartilage cells (chondrocytes) proliferate and eventually reach a state closely resembling the properties of the original cartilage. This method is known as three-dimensional culture, and is outstanding because it enables chondrocytes to be cultured while retaining their original properties.

Autologous Cultured Cartilage manufacturers in Japan:

Japan Tissue Engineering Co., Ltd. http://www.jpte.co.jp/english/index.html



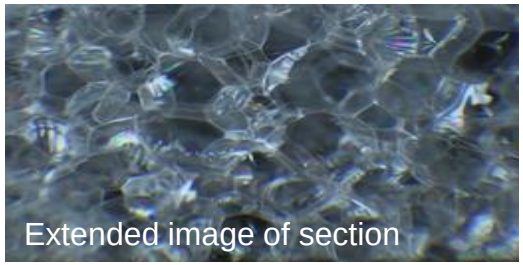
Alginate Wound Covering Material

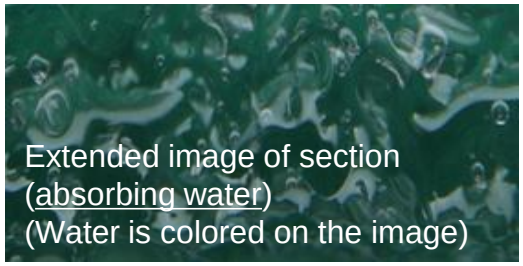
Gauze and nonwoven-fabric alginate generally used as dressings are composed of fibers. However, these fibers may eat into wound tissue. When these dressings are stripped off, they might injure the curing tissues and lead to delay of healing.

On the other hand, if KURABIO® FG invented using our proprietary technology is applied to a wound, it will absorb exudates to gelate. Therefore, this material does not eat into tissue. In addition, because KURABIO® FG can provide a wet condition suited for healing of the wound, it is expected to cure the wound more quickly.

KURABIO® FG is made of alginic acid. Gelfoam is carefully molded into sheet form, and then dried.

（KURABIO® FG）


Extended image of section


Extended image of section
(absorbing water)
(Water is colored on the image)

Characteristics

- Gelate on the wound surface
- Facilitates healing of the wound.
- Relieves pain.
- Protects the wound with gel, gently.
- Provides a wet condition that easily heals the wound.
- High absorptions of exudates and blood can lower the frequency of dressing changes.
- Does not tend to stick to the wound.
- Easy to cut by hand into the form of a wound.
- Quick and easy to apply and change.

http://www.koyoweb.com/kurabio/

Topical control hydrogel wound dressing

… is a medical device applied to wounds in order to “protect wounds”, ” keep them in a moist environment”, “promote healing” and “ease pain”.

Cross-sectional drawing

Hydrogel

Hydrogel is composed of a three-dimensional network of cross-linked hydrophilic polymers and large amounts of water. Usually, hydrogel is cross-linked using a catalyst, and unreacted catalyst may damage health. On the other hand, our patented electron beam cross-linking method, which was co-developed with Japan Atomic Energy Agency, uses no such harmful substances.

Therapeutic advantages

(1) Moisture-retaining hydrogel
It can provide a moist environment to dry wounds, even if a long time has passed since the injury.

(2) Transparency
It is quite transparent, so the condition of wounds can be observed through the dressing.

(3) Pain relief
It eases the pain of burned skin, being especially effective for children complaining of pain.

(4) Gentle to the wound
It does not stick to wounds, so the wound is not injured when the dressing is left in place.

(NICHIBAN http://www.nichiban.co.jp/en/index.html)