

New approach to the wounds by moist wound healing in Japan.

Yoshihiko Mochizuki M.D. @Tokyo Japan

What is the meaning of wound healing?

I think there are two types of wound healing.

1. True healing ←moist healing
2. Pseud healing ←using disinfectant & gauze

But, almost all Drs. & Nurses don't know the true healing of the wound.



**Burn by boiled water
6yrs girl.**

Other girl

No photo
I consulted
the scar.
Nearly same
condition to the
girl on the left
photo.

1 year after

1 year after

Moist healing

Using disinfectant & gauze



Healing !



Healing?



The cause of the wounds varies.

But, healing process is same or similar.



So, I think the wounds therapy must be same and simple.



Simple therapy is easy.



Moist healing is easy and simple!

History of moist wound healing is old.

Dr. **George D. Winter** published the paper about moist wound healing. (**Nature 193:293 1962**)

Title :

[Formation of the scab and the rate of epithelisation of superficial wounds in the skin of the young domestic pig.]

In this paper he revealed

“epithelialization would proceed **twice as fast in a moist environment** than under a scab”

But, moist wound healing did not spread.



Why?



Because of Joseph Lister's spellbinding?

Joseph Lister is a British surgeon and a pioneer of antiseptic surgery.

150 years ago, Dr. Lister believed that disinfectants over the wound is essential for wounds healing.

This was called Lister's law.

Almost all Drs. believed the Lister's law !

Although, many studies suggested that disinfectants over the wound delayed the healing and produce the ugly scar.

1. Dilute povidone-iodine solutions inhibit human skin fibroblast growth.

Dermatol Surg 2002 Mar;28(3):210-4

2. In Vitro and in vivo studies of local disinfection and wound healing.

Hautarzt 1995 May; 46(5): 319-24

3. Effect of povidone-iodine on wound healing :

J. Vasc. Nurs. 1999 Mar; 17(1):17-23

4. The effects of chlorhexidine digluconate on human fibroblasts in vitro.

J. Periodontal 1992, Jun; 63(6): 526-32

Etc.

But, many Drs. Believe the Lister's law.

In Japan, from 1996, **Dr.Makoto Natsui**
@Nerima Hikarugaoka Hospital Tokyo Japan
began to treat the wounds by
“Moist wound healing”

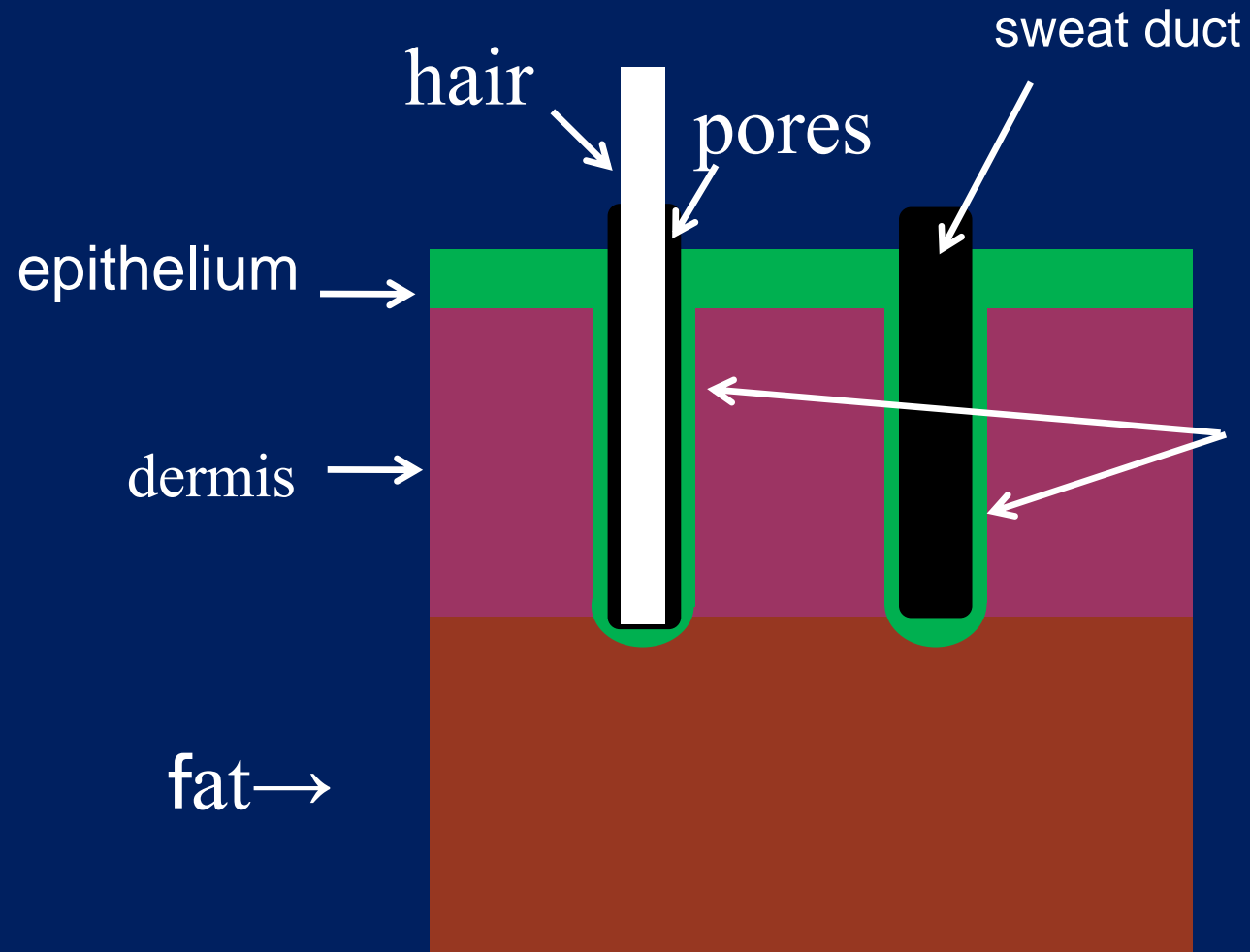
He is a pioneer of this method.

Maybe, only in Japan,
“Moist wound healing” is done.

Before showing the moist healing method

I think considering of the structure of skin
and the **process of the wound healing** is
necessary.

Structure of skin



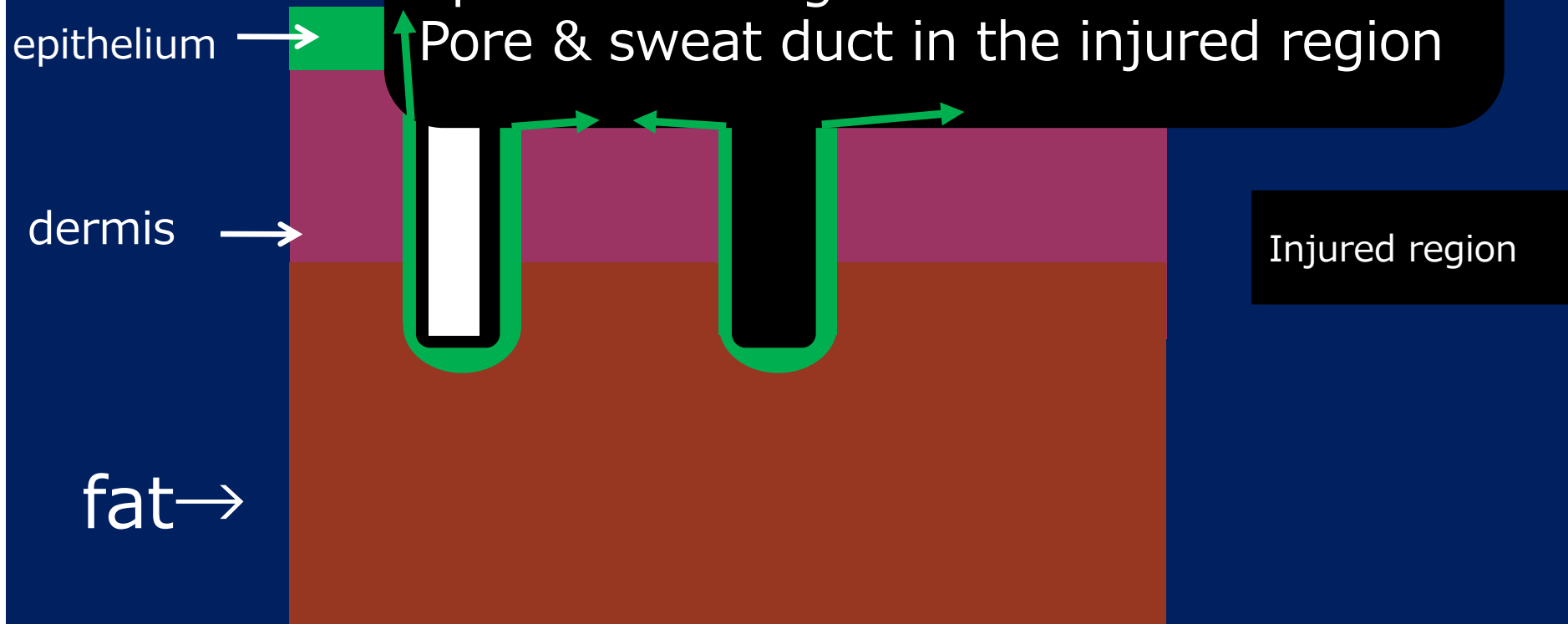
Attention !!
epithelial cell
exist in the
duct!

healing process of superficial wound

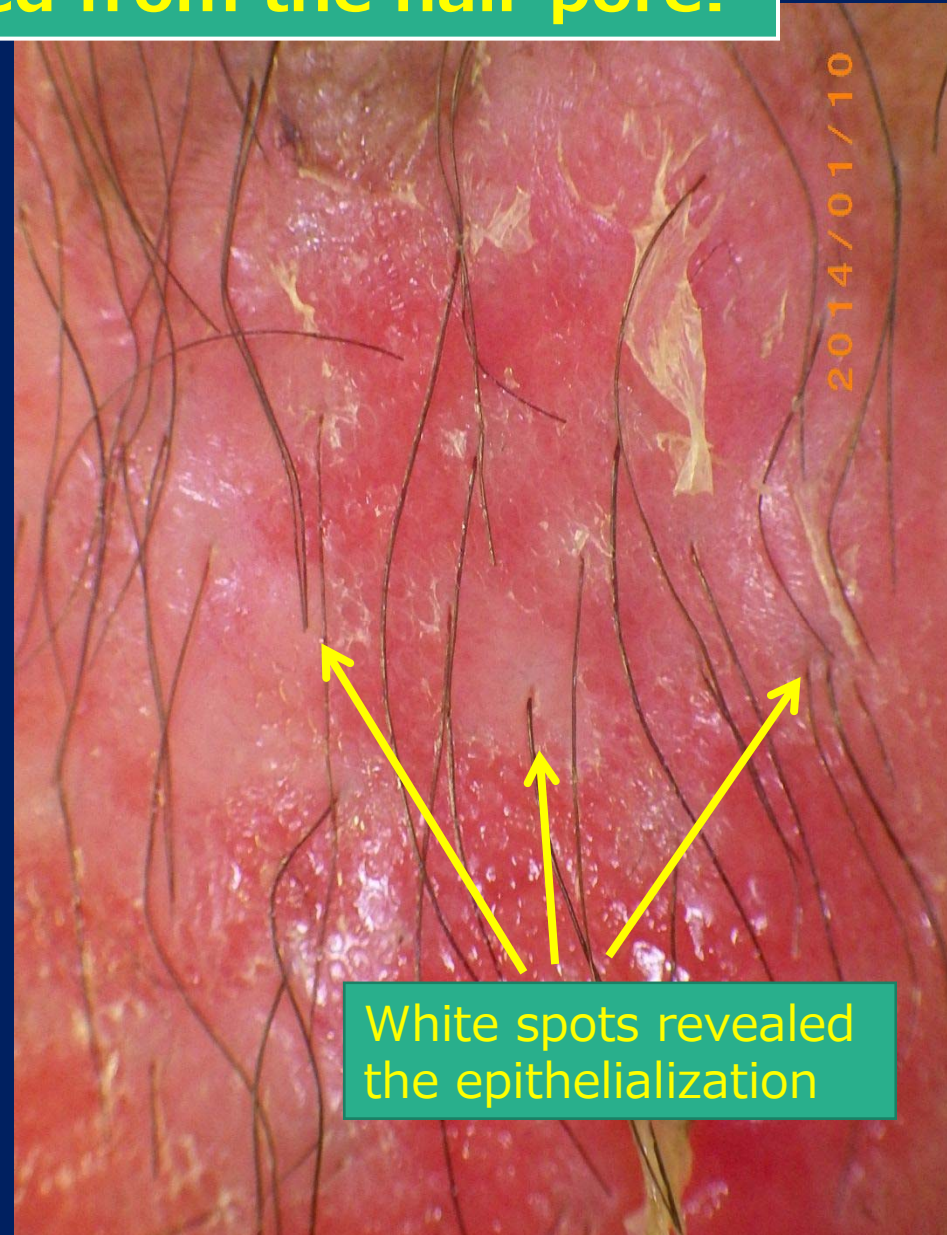
Attention!!!

Epithelial cells grow from the hair

Pore & sweat duct in the injured region



In case of superficial wound, the epithelialization occurred from the hair pore!



White spots revealed the epithelialization

What is the moist wound healing?

Two principles of the moist wound healing.

1. No disinfectants over the wound

2. Keeping the wound in moist environment

Are these principles right ?

Many Drs. believe that using the disinfectants and putting the gauze on the wound is necessary to cure the wound.

But! It's wrong!

How about disinfectants?

Disinfectants **activation time is only 15min.**

Iodine-Impregnated Drapes Enable Recording of Precordial Electrocardiogram

Yoshihiko Mochizuki, MD, Yoshitaka Okamura, MD, Hiroshi Iida, MD, Hideaki Mori, MD, and Koichiro Shimada, MD

Department of Cardiothoracic Surgery, Dokkyo University School of Medicine, Tochigi, Japan

Although we believed that the use of a polyester film drape for primary elective open sternum with delayed sternal closure made it impossible to record precordial electrocardiograms on the drape, we confirmed that it is possible to record electrocardiograms on an iodine-impregnated drape due to the iodine anion electrical conductivity.

(Ann Thorac Surg 1999;67:1184-5)
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We applied an iodine-impregnated drape (Ioban 2 Antimicrobial Film; 3M Co, St. Paul, MN) for primary elective open sternum with delayed sternal closure, due to Ioban's reported antibacterial effect [1]. Although, it has long been thought that recording of electrocardiograms (ECG), especially in the precordial lead, is limited when a drape is applied to the chest, due to the electrical conductivity of iodine, we hypothesized that iodine on the drape may assist the electrical flow from the skin to the surface of the drape, allowing ECG to be recorded on the Ioban.

Technique

We applied the Ioban on the volunteer's chest wall and recorded the ECG (Fig 1). We found no difference in the electrical activity recorded from the chest wall through the precordial lead with or without application of the Ioban (Fig 2). Therefore, we applied the Ioban to 2 patients who required primary elective open sternum with delayed sternal closure for low output syndrome. We applied the Ioban to the skin closure without sternal stenting and put the monitoring electrode on the Ioban (it is possible to place the precordial electrode in the standard position). The ECG could be recorded continuously in all leads, just as it can after normal open heart operations, which is important in assessing the condition of the heart. However, precordial ECG cannot be recorded when using Steri-Drape 2 Incise Drapes (3M Co) on the chest wall. According to 3M Health Care Limited,

the difference between Ioban and Steri-Drape 2 is the presence of the iodine-polyvinylpyrrolidone complex in the adhesive agent on the adhesive side of the polyester film of the former.

We measured the impedance between the left arm and left leg and found that the impedance of Ioban on the chest was 1,247 ohms, whereas that of Steri-Drape 2 on the chest was infinitely larger, as measured by an EIM-105 Electrode Impedance Meter (General Device Co, Ridgefield, NJ).

We measured the iodine anion concentration (atomic conc.%) on the film surface of Ioban and on the adhesive side of the film (using the Electron Spectroscopy for Chemical Analysis Physical Electronics, Inc, Eden Prairie MN) and found that it was 0.1 atomic conc.% on the film surface and 0.2 atomic conc.% on the adhesive side.

Comment

Use of Steri-Drape plastic film coverage after cardiac operations is one of the techniques for primary elective open sternum with delayed sternal closure [2-4]. However, recording of the precordial ECG on the drape has been considered impossible. We used Ioban because of its antibacterial effect. In using this type of drape, we discovered that it is possible to record the precordial ECG. The cause of this phenomenon is not yet clear. However, chemically it is well known that the iodine

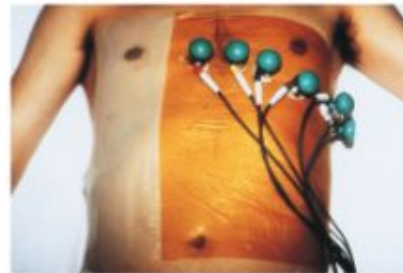


Fig 1. Photograph of precordial lead on the Ioban on the volunteer's chest wall.

Accepted for publication Sep 30, 1998.

Address reprint requests to Dr Mochizuki, Department of Cardiothoracic Surgery, Dokkyo University School of Medicine, 800 Kitakobayashi Mibucho Shimotsugun, Tochigi, 321-0293, Japan; e-mail: moch@ dokkyomed.ac.jp.

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This is my paper about iodine on "The Annals of Thoracic Surgery".

In that time, I noticed that Disinfectants' Activation time is only 15min.

The rest 23hrs45min? No activation.

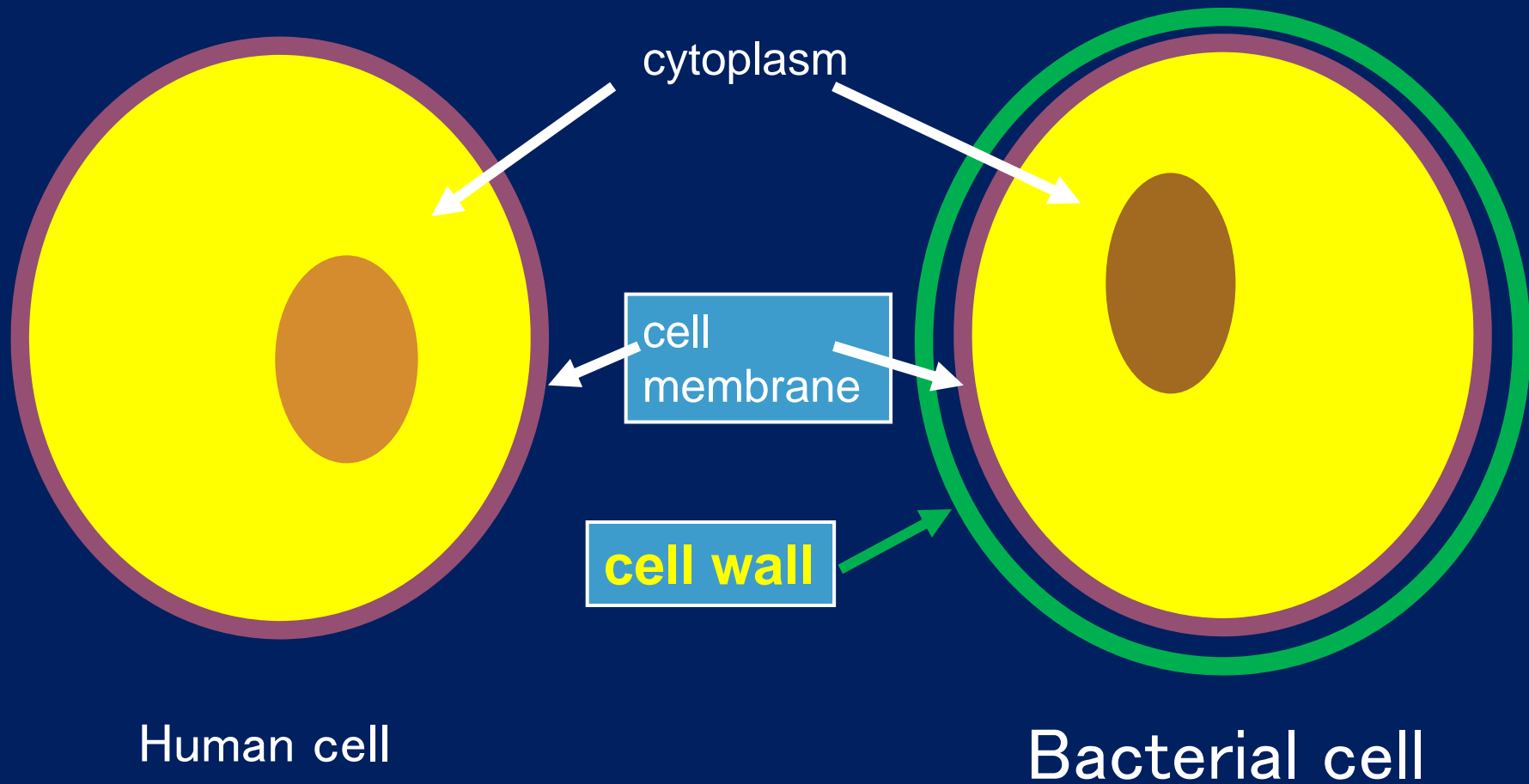
But, Many Drs. are afraid of the infection, because I don't recommend using disinfectants.

I always say to such Drs.

“Disinfectants' activation time is only 15min.”

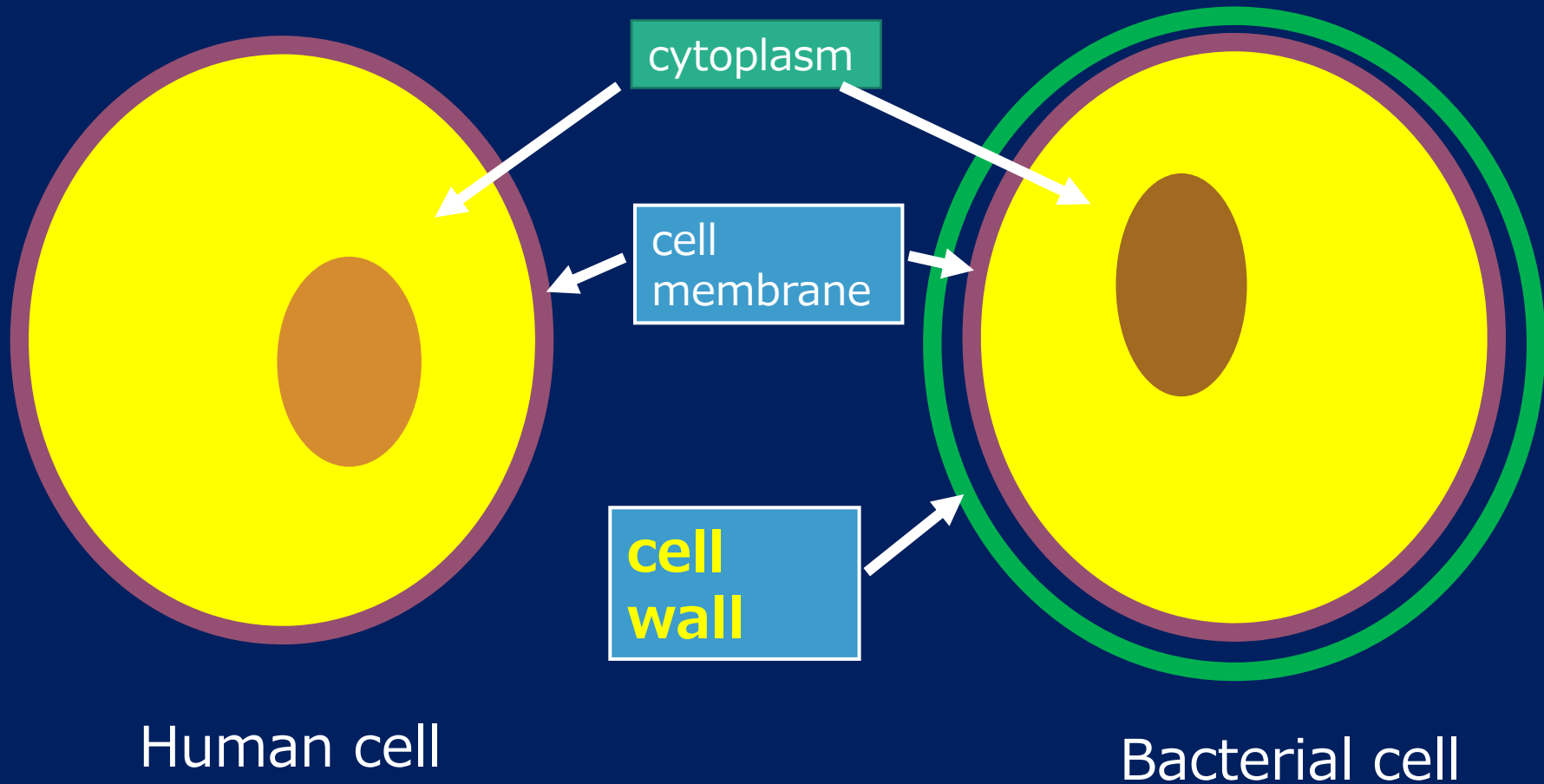
“If you believe the disinfectants' effect, you must use disinfectants every 15 min.”

Difference between Structure of the human cell and bacterial cell



Bacterial cell is **stronger** than human cell because of **cell wall** existence.

Which is more destroyed by
Disinfectants?
Human cell? or Bacterial cell?



In conclusion 1

Disinfectants destroy the human cell which repair the wound.

Disinfectants prevent the true wound healing.

How about drying of the wound by gauze?

I think the healing process of the wounds are similar to the **cell culture**.

Cell culture need moist circumference, which need good liquids.



1 day



Face burn : 0 day
covered by hydrocolloid film

White exudates were observed.
Infection? **No !**

**This white exudates heals the wounds.
Disinfectants and drying wounds by gauze stop the exudate
secretion.**

What are the white exudates?

Exudates contain, the growth factor, **cytokine**
white blood cells.

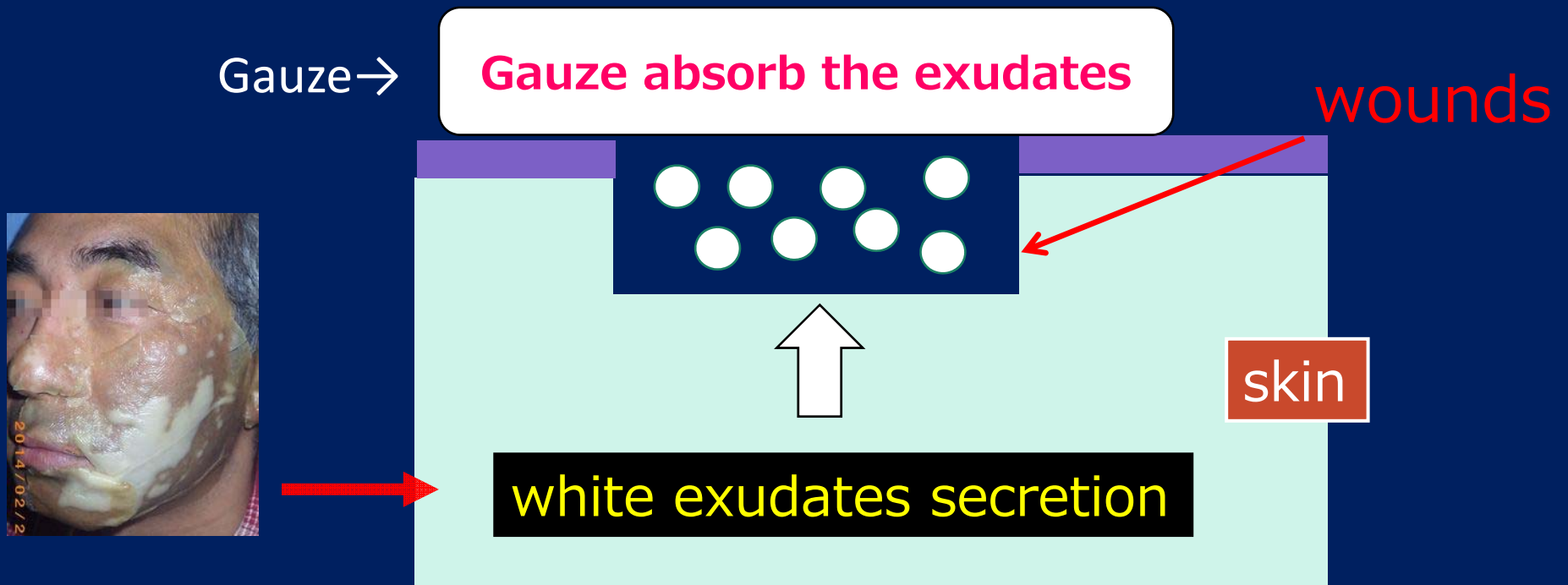
Cells around the
wounds **secrete.**

In turn, injured
cells are
repaired.

I think this white exudates are the
best cell culture liquids.

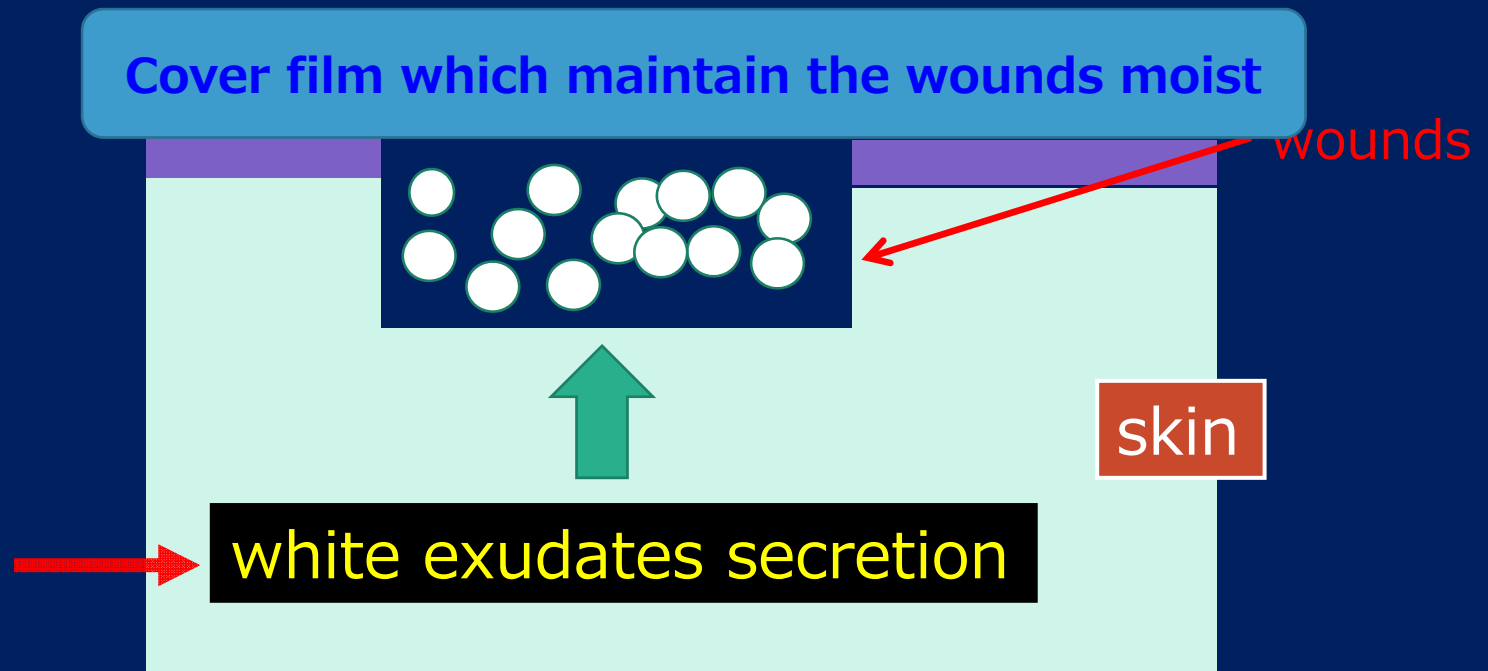
In case of gauze on the wounds.

White exudates (best cell culture liquids) disappeared and the wounds healing is delayed.



In case of moist wound healing.

White exudates (best cell culture liquids) can exist the wounds site. Then, fast and painless healing is possible!



In conclusion 2

Drying of the wound by gauze prevent the true wound healing.

1. No disinfectants over the wound
2. Keeping the wound in moist environment



This is ideal healing environment in the wound!

The following many merits appear, when you create the ideal healing environment by "Moist wound healing"

1. Little pain or no pain→less analgesics.
2. Faster wound healing.
3. Low cost.
4. Less scarring.
5. Better cosmetic results.
6. Infection rarely occurred.→less or no antibiotics use (1%)
7. Home treatment is available.
8. Minimum hospitalization or minimum treatment as an outpatient.
9. No scab formation.
10. Patient living far away from hospital is treated by iPhone with photo. Teletherapy may be possible.

How to do moist healing therapy.

- 1. Drinkable clean water is absolutely necessary to wash the wound everyday without soap.
(Soap is a disinfectant.)**
- 2. Some materials are necessary to keep the wound moist.
Cheapest material is a food wrap film.
Daily change of this material is necessary,
after washing the wound.**
- 3. To observe the wound is absolutely necessary
to evaluate the wound infection occurred or not.**

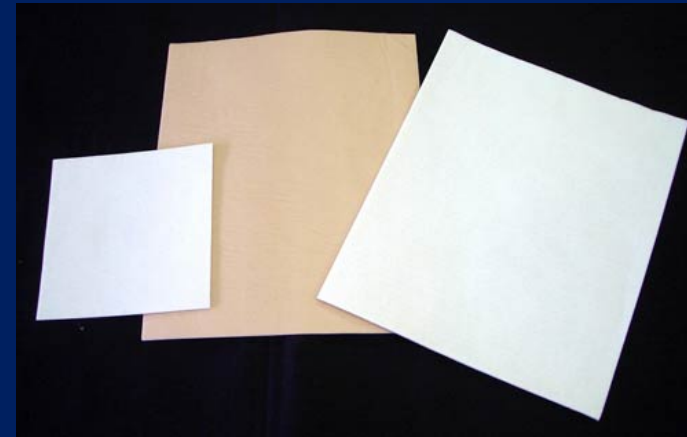
How to do moist healing therapy.

4. If foreign bodies exist in the wound, foreign bodies must be removed.
5. The Vaseline can be spread on the wound.
6. If the pus or hematoma exist under the skin, drainage of the fluid is required.

Some materials using moist wound healing method.



hydrocolloid film



Plus moist^R film by Dr.Natsui's developement

Alginate dressing in the case of bleeding.



KALTOSTAT® ConvaTec

Cheapest material is a food wrap !



21yrs male burn:
Using food wrap and Vaseline treatment was done
at home.



Burn after 1 month

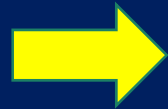


3 months

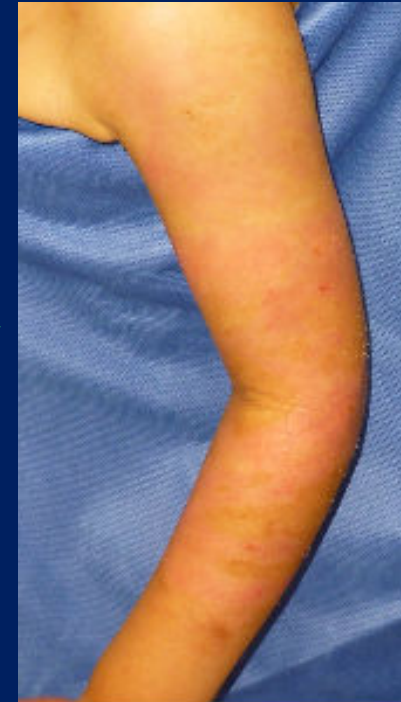
2yrs boy burn: boiled water
using food wrap & Vaseline



3days



6 days



10 days

Cases

1. lacerations
2. abrasions
3. amputations



55yrs male diabetic gangrene with MRSA infection.
Below-knee amputation was proposed in another hospital.
He rejected the proposal.

No Disinfectants and keep the wound moist.
DM treated by low carbo diet. HbA1c = 9.0 → 6.0
DM control is necessary to treat such case.

Face injury : 1yrs 6month female



0day

Hydrocolloid film on
the wound



1days



Only 2days





0 day



15days



36days



60days



155days

- 1.No disinfectants over the wound**
- 2. Keeping the wound in moist environment**

33yrs male: Ring finger injury by 100 kg Iron ball.



Another Dr. sutured the wound.

But, necrosis occurred, Then the amputation of the necrotic region was proposed.

He rejected the proposal.

Amputated line which is proposed.



0 days



84 days

4yrs boy: left index finger injury by belt conveyor



3days



16 days



50 days

Injured left finger



3 months

Drainage of the pus

Is very important.

Sometimes drainage must be

Done for long years.

Although, in such patients, when adequate drainage is done, they can work, take a bath etc. There is a no limit to daily life.

To obtain the adequate drainage,

I use some drains.

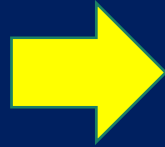
Burn

Cases of Burn

1. All blisters must be removed to protect the infection. Infection may sometimes occur in the blisters.

2. Vaseline application on the wound will be needed for pain reduction. Drying of nerve endings causes pain! Vaseline stops it.

3. In all degrees of burn, the treatment is the same.



1yr boy :boiled coffee



1 day:
crying



6 days:
Not crying



12 days



22 days

1 yr. boy : boiled water



30 yrs female : burned by boiled water



2014/09/15



2014/09/15
Necrotic skin was removed



2014/10/20



2014/09/15



2month later

Same person?

Yes!

42yrs female

Rt. hand

2014/4/22

Burn by boiled oil

2014/5/10



Teletherapy case! using iPhone.

**After moist wound care , severe pain disappeared.
No antibiotics. Just 1day analgesic was needed.
No limit to take a bath or shower.**

No Disinfectants and keep the wound moist only!

Large burn



83yrs male : Burn by boiled water

During the treatment of the wounds, always he laughed, because of no pain.
He liked alcohol, he rejected the **long hospitalization**.



2days



7days



22days



1month
discharged



6month

No Disinfectants and keep the wound moist only!

According to the text...

Large burn require IV fluid resuscitation?

Burns >20-25% TBSA require IV fluid resuscitation

Burns >30-40% TBSA may be fatal without treatment

Is it true?

TBSA :total body surface area

In the moist healing case,
No or minimum IV fluid required.

Why?

These are the answers

The answer No1.

No pain or little pain occurred.
So, the patient can eat and drink.

The answer No 2.

Because of keeping the wound moist, fluid loss volume from the burn site was a small amount.

In the case of moist healing,
No or minimum IV fluid required.



Minimum hospitalization.

In the moist healing case,
Skin grafting is rarely required.

Why?

Less scarring and better cosmetic results
are obtained by moist healing.

skin grafting case.



I think this is not the true healing!



Case : pressure ulcer



Open Wet-dressing Therapy:
“ food wrap + pet sheet “

Pressure ulcer is a special wound.



In other wounds, cause of the injury was removed.
ex. Burn Trauma etc.



But, pressure ulcer's causes are aging, poor nutrition, bedridden state.



The causes of ulcer are not removed.

The food wrap and pet sheet are very thin.

When these thin materials are used to treat the pressure ulcer, the pressure, shear and friction reduced.

This method is called "wrap therapy" or "Open Wet-dressing Therapy".

Multiple perforated food wrap + pet sheet is a cheapest and best material and easy to make it.

Open Wet-dressing Therapy was
developed by

Dr.TORIYABE, Shunichi M.D. Japan.

Toriyabe S: published the paper.

“Use of a food wrap as a dressing material.”

Advances in Wound Care, 12(8):405-406, 1999.

How to make the special material for pressure wound. It's easy to do.
We make multiple perforated wrap film.

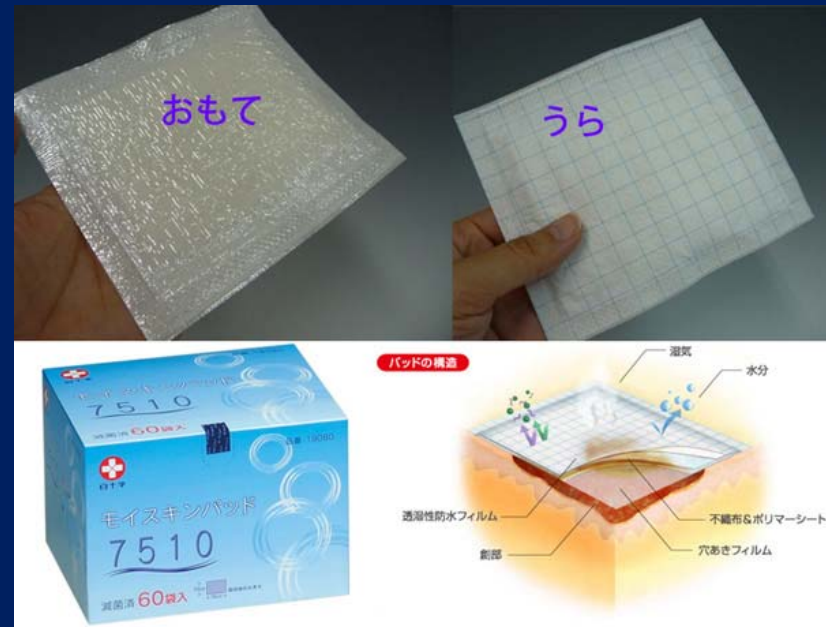
No 1



same function



This is a handmade.
1sheet =0.5R\$



This is a Moiskinpad® Hakujuji
Japan. Same function as handmade.
1sheet =2 R\$

③ Fix the film with adherent tapes. Excessive wound fluid was drained through the margins of the film.



9

Food wrap only

Week 12 d0-e0s0i0g0n0p0(0)
The wound was completely epithelialized.



84 days

Week 32

15

Food wrap only

Problems that can be encountered with
“Moist wound healing”

#1. Wound infection : 1%

#2. Miliaria or impetigo: 2-3%

#1. Wound infection

1. Detection of infection is very important.
2. Infection does not mean that bacteria are found in the wound.
3. Most useful sign of infection is a pain.
4. Sometimes, antibiotics are needed few days, until the symptoms disappear.
 - * Long-term use of antibiotics and use of strong antibiotics cause the infection of antibiotic-resistant bacteria.
 - * Antibiotics :penicillin or first-generation cephalosporin is recommended.

healthy Dr.'s hand's germ culture



Infected or not infected? Do you use antibiotics?

To be or not to be, that is not a question.
Bacteria always exist in the skin.

If infection occurs,
Celsus' quadrilateral, four cardinal signs appear!

1. pain
2. warmth
3. swelling
4. redness

Aulus Cornelius Celsus (c. 25 BC – c. 50 AD) was a roman encyclopaedist.

Infection? *Colonization?*

1. Pain+
2. Warmth+
3. swelling +
4. redness +



1. pain-
2. warmth-
3. swelling -
4. redness -



MRSA was detected both wounds.

Infection!

Need antibiotics

Infection(-)=Colonization

no antibiotics need

If infection of the wound occurs...

- 1. pain**
- 2. warmth**
- 3. swelling**
- 4. redness**

appear!

So, Dr. & Nurse must observe the wound to find out them or not.



Sands

Foreign body cause infection
and wound healing delay.

Foreign body must be removed.



#2. Miliaria and Impetigo

1. Miliaria is an itchy rash of small raised red spots.
2. Impetigo is a superficial skin infection.

For preventing these skin problems, dressings have to be changed everyday after washing the wound with plenty of tap water.

Hippocrates said, "**first, do no harm**".

I say, "**first, do no antiseptics**"

If you have any questions about moist healing, please do not hesitate to contact me.

yomochizuki@nifty.com

In English and with photo, please.



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