“Central Sterile Service in Japan”

14th WFHSS
&
8th National Sterilization Disinfection Congress of Turkey
9th November 2013 17:15-17:30

Tokyo Healthcare University Postgraduate School
Professor Hiroyoshi Kobayashi, MD PhD CICD
Cylinder (Lateral) Steam Disinfector
In Japan, 1909
Steam Steriliser installed in Yahata Steel Co. Hospital, Kyusyu (1936)
Now merged into Nippon Steel & Sumitomo Metal Corporation
1958 Sakura Fine Medical Co.
Saklura Lateral Autoclave, 1958
All were rivetted without welding
Chamberland's Autoclave

1880

Chamberland's Autoclave: The first pressure steam sterilizer, autoclave, was built in 1880 by Charles Chamberland, a pupil and collaborator of Louis Pasteur. It was patterned after Papin’s steam “digester” and resembled a modern pressure cooker.

Chamberland also invented the porcelain bacterial filter.
Conference on Sterilization
The Japanese Society of Medical Instrumentation (JSMI)
Coordinated by Professor Sataro Jitukawa,
The University of Osaka Hospital

29 October 1968 ~ 28 October 1995
Once in 1968, then
four times in each year of 1969 to 1995

First conference was held in the University of Tokyo Hospital
Totally 109 times of conferences were held
The Conferences were so helpful for the development of sterility assurance in Japan.

After then “Hospital Supply Conference” was annually held for five years in 20 century chaired by Hiroyoshi Kobayashi independently. And the conference became one of official conference of JSMI thereafter because of many requests to continue.
In the University of Tokyo Hospital, surgical theatres were centralized in July 1955, and Central Sterilisation and Supply Service was established in April 1964.
Surgical sutures were boiled and cut by ST nurse
1 September 1958
Twisted silk sutures were prepared by ST nurses

1 September 1958
And preserved in carbolic acid
1 September 1958
In 1959 steam sterilisers were newly installed in Surgical Centre, The University of Tokyo Hospital.
212 sorts of surgical sets

1969
Sterility Maintenance Test

Test tip: Penicylinder & paper filter strip
Sterility maintenance : 1 week
Last Schimmelbusch
in Surgical Suite
The University of Tokyo Hospital

1973
Double walls with air flow between them to keep the temperature comfortable in front of the steriliser.

New Steam Steriliser in Surgical Suite
The University of Tokyo Hospital
1973
Toward Cost Beneficial Storage of Surgical Single-Use Devices and Instruments
Management of single-use devices by barcode (NW7) since January 1988
Barcode card
An administrative assistant input the stock information into the computer according to the barcode cards.
More than 2000 items until 1987 were decreased to less than 1000 items.
Barcode on surgical instruments
Management by bar code on the wrappers were introduced by suppliers.
New Central Service and Surgical Suite

opened in December 1987

The University of Tokyo Hospital
In 1987 in the University of Tokyo Hospital, new surgical theatres were built. And total container system for surgical instrument supplies and robotic removal system were employed. They were the first time to employ in Japan, however for those ten years after then, the container system with packing and filter became popular in many hospitals.
The containers were imported from Germany.

December 1987
Before then in the surgical suite, there were 212 sorts of surgical sets which were prepared every day by hand of ST nurses after surgery. However toward the employing container system, the number was decreased to 46 sort of basic sets by the great efforts of ST nurses to obtain the comprehensions and supports of surgical doctors.

December 1987
TIME-TEMPERATURE PROFILE OF CONTAINER DURING STEAM STERILIZATION

Thermocouples:
1, 2, 3, 4: Inside of L-F
7, 8, 9: Inside of L-H
5, 6: Outside of L-F
10, 11: Outside of L-H
12: Inside of conventional drum

* with 3.8kg linen
** with 8.9kg linen
The instrument set is kept all through the processing and sterilising procedure. December 1987.
Special containers only for instrument removal were employed December 1987.
They were put on the removal container station in peripheral corridor of surgical suite.
Automated guiding vehicle

December 1987
Charging station of automated guiding vehicle (AGV)
Two AGV are sufficient to cover all seventeen theaters.
Automatic transportation box between central service and each ward employed in December 1987. Dimensions: 560mmL × 395mmW × 450mmH
Sterility Maintenance Test

of

Container System
The stainless test tips (10×50mm SUS 304) were inserted between surgical linens or instruments in the containers, and the containers were left unopened for 4 years 7 months in my office.

After 4 years 7 months, they were opened and test tips were cultured.

In the results, no contamination was recognised and all test tips were kept sterile. It is not for clinical application but for Guinness Book. Clinically the container set unopened for more than three months have to be retired.

Automatic Transportation System
Between Central Service and New Outpatient Department
Since 16 July 1994
Instrument Supply to Outpatient Dept.

- Transport by cart
- Decontamination
- Processing
- Sterilisation
- Use

Breakdown of Automated Transport System

- 15 July ~ 22 September
- Artificial breakdown
- Mechanical breakdown

Dimensions: 560L x 395W x 450H
Low temperature gas plasma steriliser (LTGPS) 1995
Process challenge device (PCD) for Low temperature gas plasma sterilisation
Table 4.  **Formaldehyde with Steam (73°C)**

**B. stearothermophilus 10³**

Geobacillus stearothermophilus

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Fomaldehyde disinfecter imported from Germany
Concentration of Formaldehyde in Chamber

MIRAN-103 Full Scale: 200 ppm

- Exhaust
- Neutralization
- Aeration
- Germicidal Procedure
Central Supply

NTT Tokyo Medical Center

December 2000
Peripheral corridor of surgical suite
2400w (1700w)

Automated guiding vehicle (AGV)

Dec. 2000
AGV automatically open the door of EV and come down into central service on B2 floor.
AGV come into Central Service on the B2 floor

Dec. 2000
Ambulant instruments are carried by cart Dec. 2000
Three line of ultrasonic washer disinfector

Dec. 2000
SUD Centre is located just by the sterile area of Central Service Dec. 2000
SUD point of use (POU) system as same as point of sale in super market.
Barcode scan of the envelope of used SUD for storage management in ward was employed. At the point the SUD is soled to the hospital and storage is managed by supplier.
Transporting car is able to arrive along the platform just outside the SUD administrating office.
The cart for each surgery loaded with instrument sets and SUDs is carried by EV directly go up to Surgical Suite.
Certification of Central Service Personnel
Japanese Society of Medical Instrumentation (JSMI)

2000
As I mentioned first, Conference on Sterilization, The Japanese Society of Medical Instrumentation (JSMI) was finished in 1995.

Then in 1995 “Hospital Supply Conference” was organised by H. Kobayashi independently which was held once a year only limited for five years in 20th century with many supports. In 1999 the conference was closed as promised, but many participants wanted to continue the conference. Kobayashi retired his chairmanship as promised for five years, then the conference moved to the official annual conference of JSMI in 2000. At that time many healthcare personnel engaged in central service strongly desired to make certification system for central service technicians.
Certified Sterilisation Service Technician (CSST : 2\textsuperscript{nd} grade)
since 2000
as of October 2013  3,198 active CSSTs

Certified Sterilisation Specialist (CSS : 1\textsuperscript{st} Grade)
since 2002
as of October 2013  245 active CSSs
Results

① CE and Director of Nursing Department recognise the importance of central service, as recommendation of either of them is necessary to submit the certification.

② Central service personnel become to have more opportunity to learn and to be encouraged.

③ Communication between facilities in same area and nationwide.

④ Follow-up education programme are periodically held by JSMI
Thank you very much for your kind attention