



Mongolian Emergency Service Hospital Hygiene Project

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Report on the reprocessing of surgical instruments in CSSDs of local hospitals in Ulan Bator

Hospital A

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Cleaning and disinfection

Contaminated surgical instruments (as well as in this case jars which have formerly been used for food) are delivered to reprocessing in the same wrapping in which they were sterilized. The contaminated wrapping is reused for sterilization without being cleaned or disinfected.



Cleaning and/or disinfection solutions are filled in deep plastic bins and instruments are immersed after unwrapping. The depth of the plastic bins poses a potential risk in terms of employee safety and can also be a cause for damage of instruments. Instruments are brushed after disinfection. No cleaning is conducted prior to immersion. An ultrasonic cleaner is available, yet not functioning.



A variety of process chemicals are used for cleaning and disinfection, chlorine is applied for surface disinfection amongst others (though an adequate surface disinfectant (Incidin Plus) is available). All solutions are prepared with hot water which is boiled in a kind of pan before. Dosages of solutions and residence times differ from employee to employee. The miscellaneous brushes used for brushing after disinfection are mostly inappropriate for the reprocessing of surgical instruments.





Next to reusable surgical instruments single-use products, as in this case infusion hoses, are processed as well. Instruments are not lubricated prior to sterilization, resulting in corrosion of the hinge areas.



Sterilization

Ahead of starting full sterilization cycles with actual load neither an empty cycle nor a Bowie-Dick test is run. The chambers of the sterilizers show strong signs of coating (in this case rouging). The containers used for sterilization have a sort of sliding window which is opened for sterilization and

closed after the containers have cooled. Therefore, an actual sterilization is not achieved. Moreover, most containers are damaged.



Typical loads of sterilization charges show wrong arrangements of the to-be sterilized goods (heavy goods above light goods) which results in strong residual moisture after sterilization. The use of textiles as wrapping has to be seen in a similar way concerning moisture, also the risk of burnings and/or perforations increases with every reuse.

Hygienic aspects

No disinfectant dispensers are available in the CSSD, hygienic hand disinfection is not conducted by employees. Also, jewelry (especially rings) is not taken off for work and smart or mobile phones are constantly used in the cleaning and disinfection area.

Conclusion

Following aspects should be taken into account critically:

- Available containers and textiles should be disposed and exchanged against a suitable sterilization wrapping.
- Instruments should be delivered in plastic boxes, not in wrapping material.
- Process chemicals used for cleaning and disinfection should be standardized to obtain consistent specifications for dosages and residence times (e.g. Sekusept Plus for a combined cleaning and disinfection solution for surgical instruments, and Incidin Plus for surface disinfection, both by Ecolab).
- Bins used for cleaning and disinfection should not be as deep as the currently used ones to reduce potential risk of injuries and damage of instruments.
- Instruments must be cleaned before disinfection, otherwise inorganic or organic materials may interfere with the effectiveness of the disinfection process. Also, dry organic residuals may remain on the surface of or in lumina of instruments and removal may become more difficult afterwards.

- Suitable brushes should be used for cleaning, especially for lumina.
- Surgical Instruments must be lubricated with suitable steam-permeable instrument oil prior to sterilization to reduce corrosion.
- Single-use articles (e.g. infusion hoses) should not be reused to prevent potential patient injury caused by material instability or residual contamination which could not be removed during reprocessing.
- Sterilizer chambers should be overhauled to remove coatings and afterwards be cleaned with demineralized water on a regular basis (once per week).
- An empty cycle and a Bowie-Dick test must be run once every day for every sterilizer.
 - The empty cycle is necessary to reach the operating temperature of the sterilizer and to remove residual air out of the steam pipe.
 - The Bowie-Dick test is run in an empty chamber and contains an indicator sheet or stripe. Depending on the type of sterilizer used the indicator sheet is either placed between a defined and specified number of layers or between a special mount (gravity sterilizer), or the indicator stripe is placed in a process challenge device (prevacuum sterilizer). The purpose of Bowie-Dick test is to check for residual air in the chamber which would prevent the steam to make contact with all the surfaces of the load (gravity sterilizer) and lumina of instruments (prevacuum sterilizer). The sheets/stripes change their colors uniformly to a specified other color if the sterilizer is operating properly (i.e. if it was able to remove residual air out of the chamber).
 - Employees must be trained how to conduct the daily tests properly.
- The typical loads of the sterilizers must be checked in terms of alignment of the to-be sterilized good.
- Before the purchase of new surgical instruments or new devices for reprocessing there must be comprehensive counseling (including necessary steps like training for employees who are to operate devices and the right contact persons for coordination of maintenance or for repairs).
- Explicit rules must be defined concerning the wear of jewelry and the use of personal items while working in areas in which surgical instruments are reprocessed.
- Hand disinfectant dispensers should be obtained and employees must be trained in hygienic hand disinfection.

Report submitted on 2 October 2014



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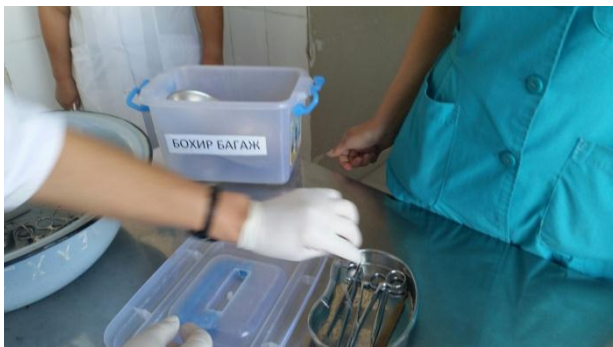
Report on the reprocessing of surgical instruments in CSSDs of local hospitals in Ulan Bator

Hospital B

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Cleaning and disinfection

Contaminated surgical instruments are delivered to reprocessing in plastic boxes. Instruments are counted upon delivery, which may increase the risk of employee injury. An ultrasonic cleaner is available, instruments are immersed after counting. The parameters temperature and time are regulated manually by employees; training for the device has not been conducted. The ultrasonic cleaner failed to show perforation of a sheet of tin foil when checked for functionality. Instruments are brushed after disinfection.



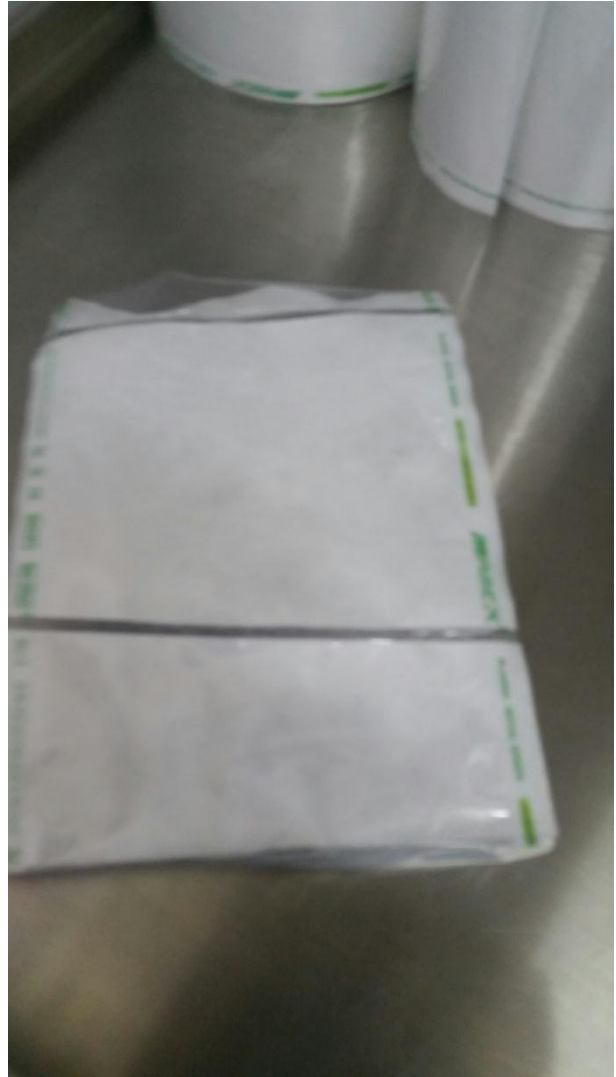
The process chemical used for cleaning and disinfection is, according to the employees, suited for cleaning and disinfection. The solution is supplied by a dosing system, unfortunately the solution is prone to foam formation, which may result in impaired disinfection effectiveness. A surface disinfection is not conducted by employees. Many instruments show strong signs of corrosion due to a lack of lubrication and coating due to wrong dosages of process chemicals as well as residence time.



During the visit, a special retractor system was brought contaminated to the CSSD without covering. Because it was needed back in the operating theatre urgently, the system was sterilized without cleaning and disinfection.

Sealing

Single instruments are packed in pouches (for both steam and low temperature sterilization) and sealed using two kitchen sealing devices. The sealing devices are inappropriate for the sealing of medical packaging, so many of the sealing areas of Tyvek pouches are burnt. Employees did not receive any training in heat sealing of medical packaging.



Sterilization

Ahead of starting full sterilization cycles with actual load neither an empty cycle nor a Bowie-Dick test is run. The chambers of the sterilizers show signs of coating (in this case rouging). The containers used for sterilization have a sort of sliding window which is opened for sterilization and closed after the containers have cooled. Therefore, an actual sterilization is not achieved. Moreover, most containers are damaged.



Typical loads of sterilization charges show wrong arrangements of the to-be sterilized goods (heavy goods above light goods, wrong alignment of single instruments in sterilization wrapping) which results in strong residual moisture after sterilization. The use of textiles as wrapping has to be seen in a similar way concerning moisture, also the risk of burnings and/or perforations increases with every reuse.



Sterilized instruments are kept in sterile goods storage until they are needed.

Endoscopy department

Flexible endoscopes are reprocessed in modern washer disinfectors, yet no process documentation is available. Contaminated endoscopes are pre-cleaned in drinking water using brushes. Cleaned and disinfected as well as contaminated endoscopes are stored in boxes of different color. After reprocessing, the endoscopes are put into drying cabinets.



Hygienic aspects

One disinfectant dispenser is available in the CSSD but is not used. Hygienic hand disinfection is not conducted by employees. Also, jewelry (especially rings) is not taken off for work and smart or mobile phones are constantly used in the cleaning and disinfection area. Personal protective equipment is not or inconsistently used.

Conclusion

Following aspects should be taken into account critically:

- Available containers and textiles should be disposed and exchanged against a suitable sterilization wrapping.
- Process chemicals used for cleaning and disinfection should be standardized to obtain consistent specifications for dosages and residence times (e.g. Sekusept Plus for a combined cleaning and disinfection solution for surgical instruments, and Incidin Plus for surface disinfection, both by Ecolab).
- Instruments must be cleaned before disinfection, otherwise inorganic or organic materials may interfere with the effectiveness of the disinfection process. Also, dry organic residuals may remain on the surface of or in lumina of instruments and removal may become more difficult afterwards.
- Instruments should be counted after cleaning and disinfection to reduce risk of potential infections.
- The temperature of the solution used in the ultrasonic cleaner may not exceed 40°C, otherwise protein fixation may occur. Generally, solutions must be changed if they are visually contaminated, but at least once a day. Operability of the ultrasonic cleaner should be checked using tin foil test; a venting (at least 10 minutes) should be conducted before use of the ultrasonic cleaner to reduce performance impairing.
- Surfaces should be disinfected with a suitable surface disinfectant after every use.
- Suitable brushes should be used for cleaning, especially for lumina.

- Surgical Instruments must be lubricated with suitable steam-permeable instrument oil prior to sterilization to reduce corrosion.
- Medical packaging should be sealed with appropriate sealing devices. To avoid burnings of sealing areas, the temperatures used must be adequate for the particular pouches used (steam or low temperature sterilization). For medical packaging (i.e. pouches), the distance between instruments and heat-sealed joint must be at least 3cm to avoid tearing. The distance between heat-sealed joint and the upper end of the pouch must be at least 2-3 cm to facilitate peeling after sterilization. The width of the heat-sealed joint itself must be at least 6mm. It is crucial that there are no air entrapments in the heat-sealed joint for it allows air to get back into the sterilized pouch, rendering the surgical instruments inside the pouch unsterile.
- Sterilizer chambers should be overhauled to remove coatings and afterwards be cleaned with demineralized water on a regular basis (once per week).
- An empty cycle and a Bowie-Dick test must be run once every day for every sterilizer.
 - The empty cycle is necessary to reach the operating temperature of the sterilizer and to remove residual air out of the steam pipe.
 - The Bowie-Dick test is run in an empty chamber and contains an indicator sheet or stripe. Depending on the type of sterilizer used the indicator sheet is either placed between a defined and specified number of layers or between a special mount (gravity sterilizer), or the indicator stripe is placed in a process challenge device (prevacuum sterilizer). The purpose of Bowie-Dick test is to check for residual air in the chamber which would prevent the steam to make contact with all the surfaces of the load (gravity sterilizer) and lumina of instruments (prevacuum sterilizer). The sheets/stripes change their colors uniformly to a specified other color if the sterilizer is operating properly (i.e. if it was able to remove residual air out of the chamber).
 - Employees must be trained how to conduct the daily tests properly.
- The typical loads of the sterilizers must be checked in terms of alignment of the to-be sterilized good.
- Before the purchase of new surgical instruments or new devices for reprocessing there must be comprehensive counseling (including necessary steps like training for employees who are to operate devices and the right contact persons for coordination of maintenance or for repairs).
- Explicit rules must be defined concerning the wear of jewelry and the use of personal items while working in areas in which surgical instruments are reprocessed.
- Hand disinfectant dispensers should be obtained and employees must be trained in hygienic hand disinfection.
- Personal protective equipment must be worn consistently.

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Report on the reprocessing of surgical instruments in CSSDs of local hospitals in Ulan Bator

Hospital C

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Cleaning and disinfection

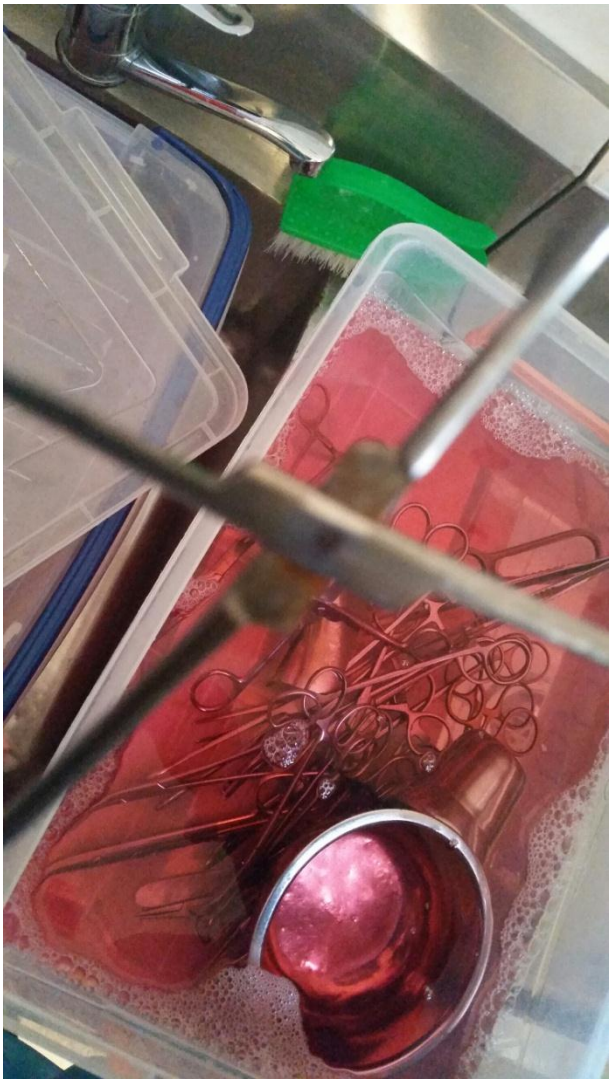
The CSSD of First Maternity Hospital is split on two floors. One department uses gravity sterilizers, the other uses prevacuum sterilizers. Surgical Instruments (including lumina) are pre-cleaned in operating theatres and counted when delivered to the CSSD. In one department, instruments are tested for residual protein using a testing solution. If the test is positive, instruments are sent back to the operating theatre to be cleaned again.



In this department, instruments are delivered in plastic boxes, in the other they are delivered in textile wrappings which are reused for sterilization without cleaning and disinfection. Cleaning and/or disinfection solutions are filled in deep plastic bins and instruments are immersed after counting. After disinfection, instruments are brushed with inappropriate brushes (no brushes are available for laparoscopic instruments). Next to reusable surgical instruments single-use products are processed as well.



Many instruments show strong signs of corrosion due to a lack lubrication. Also, many laparoscopic instruments show heavy residual contamination after disinfection.



The process chemical used for cleaning and disinfection is a combination of concentrated hydrogen peroxide (30-35%) and a cleaning detergent. Laparoscopic instruments are immersed and left in the solution for 24 hours. A surface disinfection is not conducted by employees.



Working tables are made of wood and are laminated with plastic foil. Above the foil, textiles are used as coverings.



Sterilization

Ahead of starting full sterilization cycles with actual load no empty cycle is run. A Bowie-Dick test is only run in one department, but only the indicator sheet without adequate mount is used. The containers used for sterilization have a sort of sliding window which is opened for sterilization and closed after the containers have cooled. Therefore, an actual sterilization is not achieved. Moreover, most containers are damaged.



Damaged containers are wrapped in textiles. The use of textiles as wrapping has to be seen critical concerning moisture, also the risk of burnings and/or perforations increases with every reuse.



The door gasket of one of the prevacuum sterilizers is broken, so employees have to press against the door until enough vacuum is drawn.



For sterilization, many different programs are used with different exposure times for the same loads.

Hygienic aspects

No disinfectant dispensers are available in the CSSD. Hygienic hand disinfection is not conducted by employees. Also, jewelry (especially rings) is not taken off for work and smart or mobile phones are constantly used in the cleaning and disinfection area.

Conclusion

Following aspects should be taken into account critically:

- Areas within the department should be clearly subdivided into contaminated and clean areas.
- Available containers and textiles should be disposed and exchanged against a suitable sterilization wrapping.
- Process chemicals used for cleaning and disinfection should be standardized to obtain consistent specifications for dosages and residence times (e.g. Sekusept Plus for a combined

cleaning and disinfection solution for surgical instruments, and Incidin Plus for surface disinfection, both by Ecolab).

- Instruments must be cleaned before disinfection, otherwise inorganic or organic materials may interfere with the effectiveness of the disinfection process. Also, dry organic residuals may remain on the surface of or in lumina of instruments and removal may become more difficult afterwards.
- Instruments should not be pre-cleaned in operating theatres.
- Instruments should be counted after cleaning and disinfection to reduce risk of potential infections.
- Surfaces should be disinfected with a suitable surface disinfectant after every use.
- Textile coverings of working tables should be removed and the plastic surface should be disinfected after every use as well as exchanged if torn.
- Suitable brushes should be used for cleaning, especially for lumina.
- Surgical Instruments must be lubricated with suitable steam-permeable instrument oil prior to sterilization to reduce corrosion.
- Sterilizer chambers should be cleaned with demineralized water on a regular basis (once per week).
- An empty cycle and a Bowie-Dick test must be run once every day for every sterilizer.
 - The empty cycle is necessary to reach the operating temperature of the sterilizer and to remove residual air out of the steam pipe.
 - The Bowie-Dick test is run in an empty chamber and contains an indicator sheet or stripe. Depending on the type of sterilizer used the indicator sheet is either placed between a defined and specified number of layers or between a special mount (gravity sterilizer), or the indicator stripe is placed in a process challenge device (prevacuum sterilizer). The purpose of Bowie-Dick test is to check for residual air in the chamber which would prevent the steam to make contact with all the surfaces of the load (gravity sterilizer) and lumina of instruments (prevacuum sterilizer). The sheets/strips change their colors uniformly to a specified other color if the sterilizer is operating properly (i.e. if it was able to remove residual air out of the chamber).
 - Employees must be trained how to conduct the daily tests properly.
- The typical loads of the sterilizers must be checked in terms of alignment of the to-be sterilized good.
- One sterilization program suited for all to-be sterilized instruments should be used instead of many different to achieve a standard procedure of sterilization.
- Before the purchase of new surgical instruments or new devices for reprocessing there must be comprehensive counseling (including necessary steps like training for employees who are to operate devices and the right contact persons for coordination of maintenance or for repairs).
- Explicit rules must be defined concerning the wear of jewelry and the use of personal items while working in areas in which surgical instruments are reprocessed.
- Hand disinfectant dispensers should be obtained and employees must be trained in hygienic hand disinfection.

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Hospital D

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Cleaning and disinfection

Instruments are pre-cleaned in the examination room by immersion in chlorine solution and delivered in plastic boxes for further reprocessing; the surfaces are disinfected using chlorine or iodine.

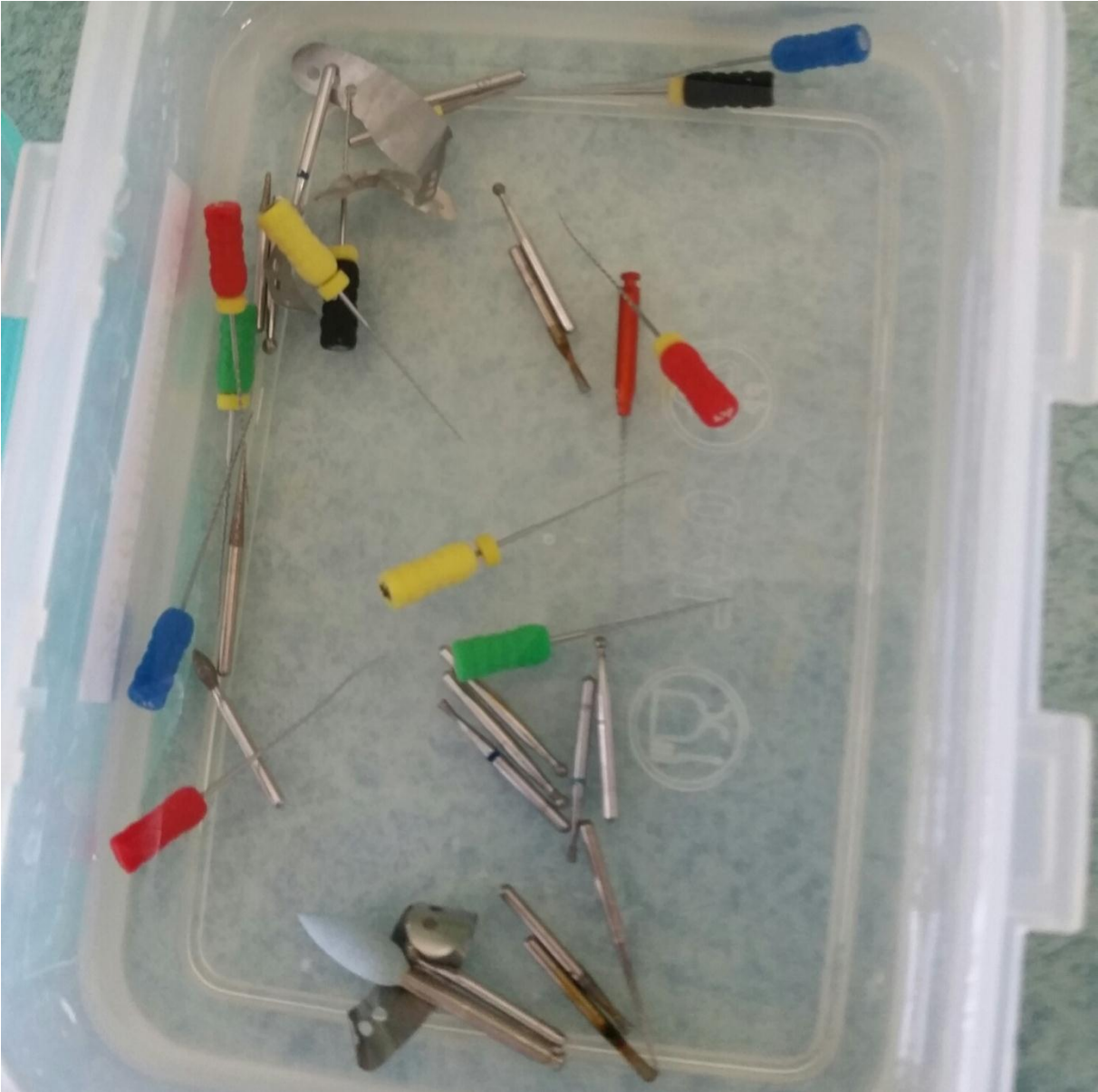


After disinfection, instruments are brushed with inappropriate brushes (no brushes are available for lumina). The sink used for cleaning is too low, so that employees adopt an unnatural posture most probably promoting back problems.



An ultrasonic cleaner is available and used. The parameters temperature and time are regulated manually by employees; training for the device has not been conducted.

Many instruments show strong signs of coating.



Working tables are made of wood and are laminated with plastic foil. Above the foil, textiles are used as coverings.



Sealing

Single instruments are packed in pouches and sealed using a kitchen sealing device. Also, pouches and textiles are used in combination. The sealing device is inappropriate for the sealing of medical packaging, so many of the sealing areas of pouches are burnt. Employees did not receive any training in heat sealing of medical packaging.



Sterilization

Ahead of starting full sterilization cycles with actual load no empty cycle is run. A Bowie-Dick test is only run in one department, but only the indicator sheet without adequate mount is used. The containers used for sterilization have a sort of sliding window which is opened for sterilization and closed after the containers have cooled. Therefore, an actual sterilization is not achieved. Moreover, most containers are damaged.



Of two sterilizers, one is not tight and steam is leaking out at the side. The door of this sterilizer shows a massive corrosion on the inside. Also, the chambers of the sterilizers show signs of coating. According to an employee, sterile goods are often wet after sterilization. To reduce moisture, already sterilized goods are sterilized again.



Expired sterile goods are sterilized again keeping the old wrapping.



Hygienic aspects

No disinfectant dispensers are available in the CSSD. Hygienic hand disinfection is not conducted by employees. Also, jewelry (especially rings) is not taken off for work and smart or mobile phones are constantly used in the cleaning and disinfection area.

Conclusion

Following aspects should be taken into account critically:

- Available containers and textiles should be disposed and exchanged against a suitable sterilization wrapping.
- Process chemicals used for cleaning and disinfection should be standardized to obtain consistent specifications for dosages and residence times (e.g. Sekusept Plus for a combined cleaning and disinfection solution for surgical instruments, and Incidin Plus for surface disinfection, both by Ecolab).
- Instruments must be cleaned before disinfection, otherwise inorganic or organic materials may interfere with the effectiveness of the disinfection process. Also, dry organic residuals may remain on the surface of or in lumina of instruments and removal may become more difficult afterwards.
- Instruments should not be pre-cleaned in examination rooms.
- The temperature of the solution used in the ultrasonic cleaner may not exceed 40°C, otherwise protein fixation may occur. Generally, solutions must be changed if they are visually contaminated, but at least once a day. Operability of the ultrasonic cleaner should be checked using tin foil test; a venting should be conducted before use of the ultrasonic cleaner to reduce performance impairing.
- Surfaces should be disinfected with a suitable surface disinfectant after every use.

- Textile coverings of working tables should be removed and the plastic surface should be disinfected after every use as well as exchanged if torn.
- Suitable brushes should be used for cleaning, especially for lumina.
- Surgical Instruments must be lubricated with suitable steam-permeable instrument oil prior to sterilization to reduce corrosion.
- Medical packaging should be sealed with appropriate sealing devices. To avoid burnings of sealing areas, the temperatures used must be adequate for the particular pouches used (steam or low temperature sterilization). For medical packaging (i.e. pouches), the distance between instruments and heat-sealed joint must be at least 3cm to avoid tearing. The distance between heat-sealed joint and the upper end of the pouch must be at least 2-3 cm to facilitate peeling after sterilization. The width of the heat-sealed joint itself must be at least 6mm. It is crucial that there are no air entrapments in the heat-sealed joint for it allows air to get back into the sterilized pouch, rendering the surgical instruments inside the pouch unsterile.
- Sterilizer chambers should be overhauled to remove coatings and afterwards be cleaned with demineralized water on a regular basis (once per week).
- The leaky sterilizer must be put out of service and be repaired promptly.
- An empty cycle and a Bowie-Dick test must be run once every day for every sterilizer.
 - The empty cycle is necessary to reach the operating temperature of the sterilizer and to remove residual air out of the steam pipe.
 - The Bowie-Dick test is run in an empty chamber and contains an indicator sheet or stripe. Depending on the type of sterilizer used the indicator sheet is either placed between a defined and specified number of layers or between a special mount (gravity sterilizer), or the indicator stripe is placed in a process challenge device (prevacuum sterilizer). The purpose of Bowie-Dick test is to check for residual air in the chamber which would prevent the steam to make contact with all the surfaces of the load (gravity sterilizer) and lumina of instruments (prevacuum sterilizer). The sheets/stripes change their colors uniformly to a specified other color if the sterilizer is operating properly (i.e. if it was able to remove residual air out of the chamber).
 - Employees must be trained how to conduct the daily tests properly.
- The typical loads of the sterilizers must be checked in terms of alignment of the to-be sterilized good.
- Expired sterile goods must be wrapped up anew before sterilization.
- Before the purchase of new surgical instruments or new devices for reprocessing there must be comprehensive counseling (including necessary steps like training for employees who are to operate devices and the right contact persons for coordination of maintenance or for repairs).
- Explicit rules must be defined concerning the wear of jewelry and the use of personal items while working in areas in which surgical instruments are reprocessed.
- Hand disinfectant dispensers should be obtained and employees must be trained in hygienic hand disinfection.

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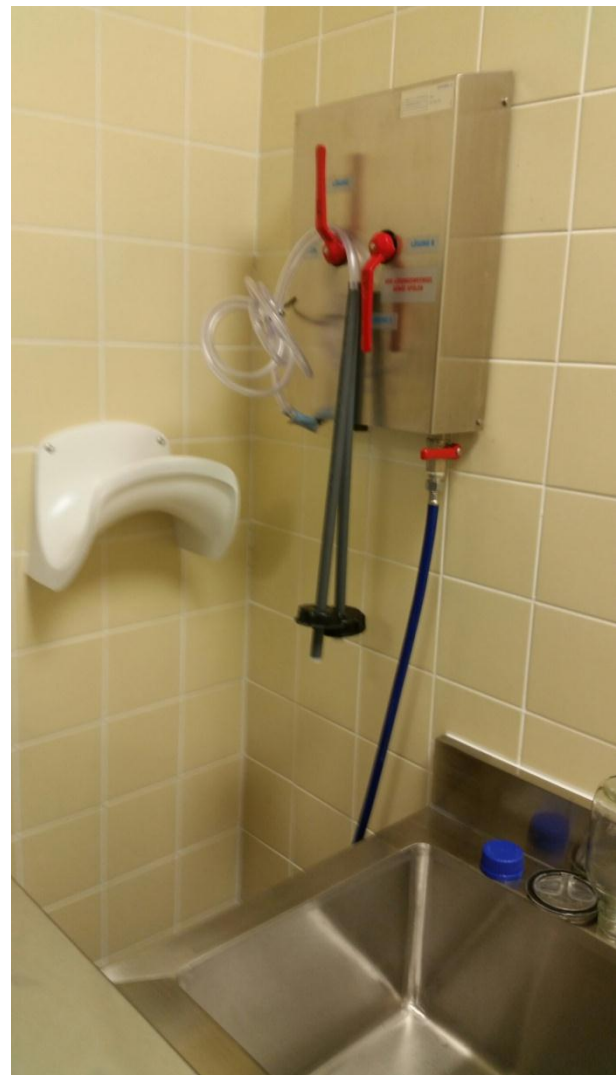
Report on the reprocessing of surgical instruments in CSSDs of local hospitals in Ulan Bator

Hospital E

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Cleaning and disinfection

Two washer disinfectors for automated reprocessing of surgical instruments are available, but not in use (according to employees, the necessary water connection has yet to be established; suitable process chemicals by Dr. Weigert are available). For cleaning and disinfection, a mixture of a cleaning detergent and water is used, as well as dish liquid (Fairy). A dosing system is available, but not in use.



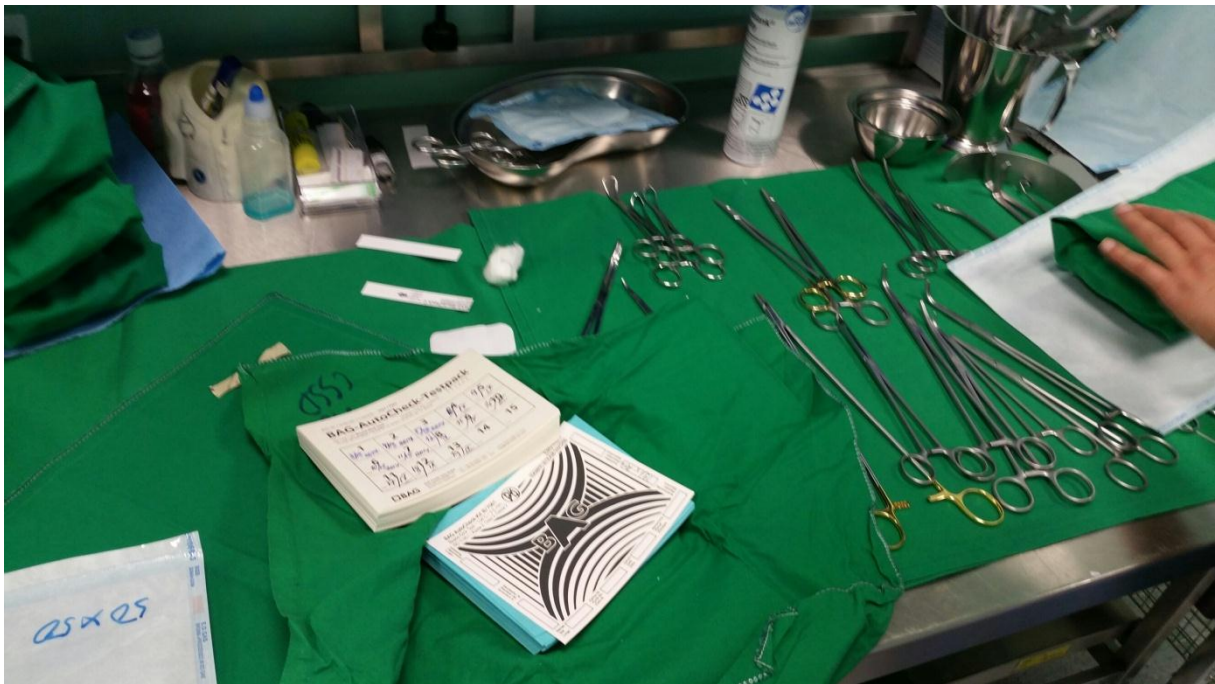
Metal office filing baskets are utilized for manual cleaning and disinfection.



After disinfection, instruments are brushed with inappropriate brushes (no brushes are available for lumina). An ultrasonic cleaner is available and used. The parameters temperature and time are regulated manually by employees; training for the device has not been conducted.



Working tables are made of stainless steel and are covered with textiles. A suitable lubricant for instruments is not available.



Sealing

Single instruments are packed in pouches and sealed using a modern sealing device by MMM. Unfortunately, sealing parameters are not adjusted to the packaging used. Employees did not receive any training in heat sealing of medical packaging.



Sterilization

Ahead of starting full sterilization cycles with actual load no empty cycle is run. A Bowie-Dick test is run, but only the indicator sheet without adequate mount is used. The CSSD possesses two modern prevacuum sterilizers. The containers used for sterilization are adequate; besides that, textiles are used for wrapping.



According to employees, bottles with water are sterilized for the intensive care unit.



Hygienic aspects

No disinfectant dispensers are available in the CSSD. Hygienic hand disinfection is not conducted by employees. Also, jewelry (especially rings) is not taken off for work and smart or mobile phones are constantly used in the cleaning and disinfection area.

Not all questions and concerns could be put respectively addressed for the representative of hospital hygiene was not consistently available during the visit.

Conclusion

Following aspects should be taken into account critically:

- The CSSD is using modern sterilization wrapping (containers and pouches) next to textiles. Textiles should be removed from the process generally to avoid residual moisture after sterilization.
- Process chemicals used for cleaning and disinfection should be standardized to obtain consistent specifications for dosages and residence times (e.g. Sekusept Plus for a combined cleaning and disinfection solution for surgical instruments, and Incidin Plus for surface disinfection, both by Ecolab) as long as automated cleaning and disinfection processes are not functioning.
- Water connection for the washer disinfectors should be established as soon as possible.
- Instruments should be pre-cleaned in the CSSD to maximize cleaning results.
- The temperature of the solution used in the ultrasonic cleaner may not exceed 40°C, otherwise protein fixation may occur. Generally, solutions must be changed if they are visually contaminated, but at least once a day. Operability of the ultrasonic cleaner should be checked using tin foil test; a venting (at least 10 minutes) should be conducted before use of the ultrasonic cleaner to reduce performance impairments.
- Surfaces should be disinfected with a suitable surface disinfectant after every use.
- Textile coverings of working tables should be removed and surfaces should be disinfected after every use.
- Suitable brushes should be used for cleaning, especially for lumina.
- Surgical Instruments must be lubricated with suitable steam-permeable instrument oil prior to sterilization to reduce corrosion.
- Medical packaging should be sealed with appropriate sealing devices. To avoid burnings of sealing areas, the temperatures used must be adequate for the particular pouches used (steam or low temperature sterilization). For medical packaging (i.e. pouches), the distance between instruments and heat-sealed joint must be at least 3cm to avoid tearing. The distance between heat-sealed joint and the upper end of the pouch must be at least 2-3 cm to facilitate peeling after sterilization. The width of the heat-sealed joint itself must be at least 6mm. It is crucial that there are no air entrapments in the heat-sealed joint for it allows air to get back into the sterilized pouch, rendering the surgical instruments inside the pouch unsterile.
- Sterilizer chambers should be cleaned with demineralized water on a regular basis (once per week).
- An empty cycle and a Bowie-Dick test must be run once every day for every sterilizer.

- The empty cycle is necessary to reach the operating temperature of the sterilizer and to remove residual air out of the steam pipe.
- The Bowie-Dick test is run in an empty chamber and contains an indicator sheet or stripe. Depending on the type of sterilizer used the indicator sheet is either placed between a defined and specified number of layers or between a special mount (gravity sterilizer), or the indicator stripe is placed in a process challenge device (prevacuum sterilizer). The purpose of Bowie-Dick test is to check for residual air in the chamber which would prevent the steam to make contact with all the surfaces of the load (gravity sterilizer) and lumina of instruments (prevacuum sterilizer). The sheets/stripes change their colors uniformly to a specified other color if the sterilizer is operating properly (i.e. if it was able to remove residual air out of the chamber).
- Employees must be trained how to conduct the daily tests properly.
- The typical loads of the sterilizers must be checked in terms of alignment of the to-be sterilized good.
- The sterilization of water-filled bottles for the intensive care unit serves no purpose for only disinfection is achieved, but not a sterilization.
- Before the purchase of new surgical instruments or new devices for reprocessing there must be comprehensive counseling (including necessary steps like training for employees who are to operate devices and the right contact persons for coordination of maintenance or for repairs).
- Explicit rules must be defined concerning the wear of jewelry and the use of personal items while working in areas in which surgical instruments are reprocessed.
- Hand disinfectant dispensers should be obtained and employees must be trained in hygienic hand disinfection.
- The department should take care that the use of the modern equipment is maximized and that old reprocessing standards are kept out of the department. The focus should be mainly on employee trainings and sensitization for a modern reprocessing of surgical instruments.

Report submitted on 2 October 2014