Hôpital du Valais
Spital Wallis

Institut Central des Hôpitaux
Zentralinstitut der Spitäler

Risque infectieux associé aux endoscopes flexibles et retraitement

PCI ET EVIDENCE-BASED MEDICINE/NURSING

FORUM HYGIÈNE HOSPITALIÈRE, CHUV

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Introduction

Dispositifs médicaux réutilisables (DMR) et retraitement

Définition (d'après Splauding)	Exemples	Minimum requis	Moyen requis	Spectre d'activité
Dispositifs semi-critiques (entrent en contact avec des muqueuses non stériles ou la peau non intacte)	Bronchoscope, endoscopes digestifs	Désinfection de haut niveau : élimination de tous les micro-organismes, à l'exception de quelques spores	Processus de nettoyage non-fixant suivi par une désinfection chimique à base d'acide peracétique ou d'aldéhydes ou désinfection thermique	Bactéricide Levuricide/ fongicide Virucide (virus nu et enveloppé) Mycobactéricide

Spaulding E, et al. Philadelphia: Lea & Febiger. 1968:517-531
Swissnoso, Volume 6, Numéro 4. Schweiz Med Forum 2005 ;5 :660–666
Directives suisses pour le retraitement des endoscopes flexibles. SSG/SSP/SSHH/ ASPE Version 2.0 du 23.02.2021
Bonnes pratiques suisses de retraitement des dispositifs médicaux. SSSH/SSHH/Swissmedic. Version 2022

Principales voies et sources de transmission nosocomiale de micro-organismes par les endoscopes

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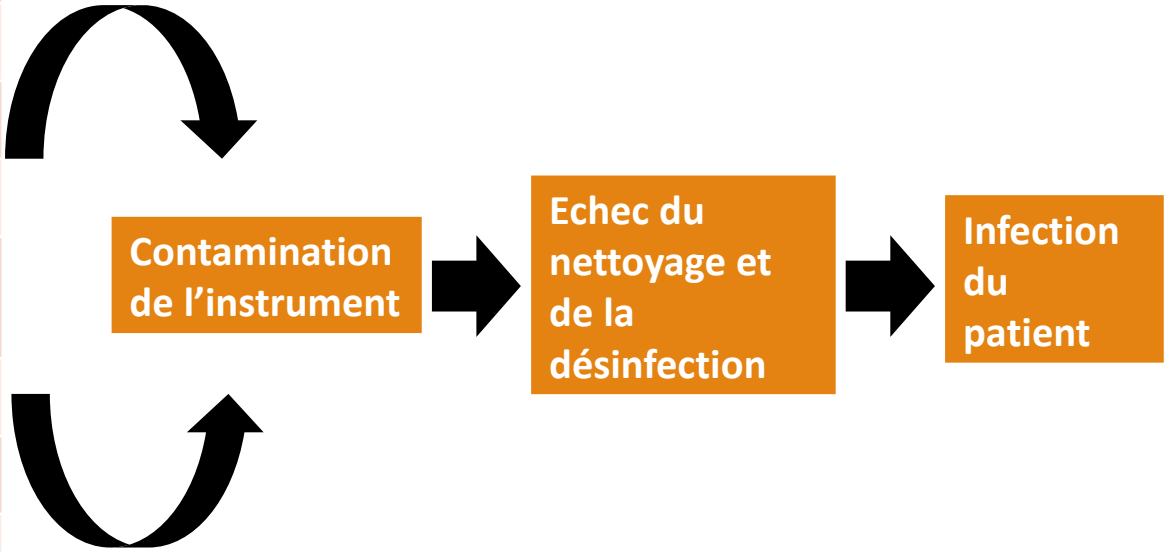
Microorganismes provenant des patients	Microorganismes provenant de l'environnement
Flore normale et autres colonisants	**Solution d'irrigation**
Escherichia coli	*Pseudomonas* spp.
Klebsiella spp.	Mycobactéries atypiques
Serratia spp.	
Infections ou portage chroniques	**Germe pouvant contaminer les machines**
Salmonella spp.	*Enterobacter* spp.
Helicobacter pylori	*Citrobacter* spp.
Mycobacterium tuberculosis	*Pseudomonas* spp.
Virus hépatite B, hépatite C, HIV	
Clostridium difficile	



Spach DH, et al. Ann Intern Med. 1993 Jan 15;118(2):117-28

Résistance des agents infectieux aux désinfectants

Prions

Bactéries sporulées (*Bacillus subtilis, Clostridium difficile*, etc.)

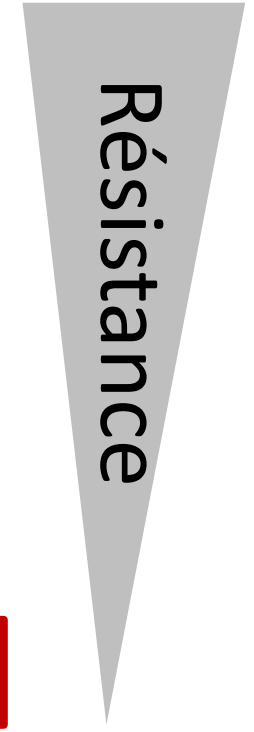
Mycobactéries

Virus nus (non lipidiques) (Poliovirus, Rhinovirus, etc.)

Champignons

Bactéries végétatives

Virus enveloppés (lipidiques) (Virus hépatite B, Virus hépatite C, HIV, etc.)



Spach DH, et al. Ann Intern Med. 1993 Jan 15;118(2):117-28
World Gastroenterology Organisation/ World Endoscopy Organization Global Guidelines. February 2011. http://www.worldgastroenterology.org/

Modalités de contamination des DMR

- **Sources de contamination des DMR possibles:**
  - à chaque étape du procédé de désinfection des DMR (du prétraitement au stockage)
  - en raison d'un défaut de niveau de traitement du DMR lié à une mauvaise classification du DMR selon la classification de Spaulding (critique, semi-critique et non critique)
  - le procédé de traitement, lui-même contaminé, peut entraîner la contamination du DMR (*Burkholderia cepacia*)

- **Facteurs favorisant une contamination:**
  - formation de biofilm = frein à une désinfection optimale par la résistance de certains microorganismes à la désinfection ; notamment de bactéries hautement résistantes émergentes
  - altération d'un DMR

Mehta AC, et al. Chest. 2020;157(2):454-469
Galdys AL, et al. Infect Control Hosp Epidemiol. 2019;40(1):40 46
Hafliger E, Atkinson A, Marschall J. Infect Prev Pract. 2020;2(3):100082

Qualité des résultats du retraitement des endoscopes

- Seuil de référence : ≤ 20 UFC/canal (≤ 1 UFC/ml échantillon de rinçage pour 20 ml d'échantillon)
- Les microorganismes suivants ne doivent pas être présents:
  - ***Escherichia coli*, autres enterobacteriaceae, entérocoques**

    Indication d'un nettoyage pu d'une désinfection insuffisants
  - ***Pseudomonas aeruginosa*, et autres non-fermenteurs**

    Indication d'une qualité d'eau pauvre lors du rinçage final et d'un séchage insuffisant
  - ***Staphylococcus aureus***

    Indication d'une contamination en raison d'un stockage insuffisant ou d'une hygiène des mains déficiente
  - **Streptocoques alpha-hémolytiques**

    Indication d'un nettoyage ou d'une désinfection insuffisantes

Directives suisses pour le retraitement des endoscopes flexibles. SSG/SSP/SSHH/ ASPE Version 2.0 du 23.02.2021

Que faire en cas de non-conformité ?

Directive suisse pour le retraitement des endoscopes flexibles
Version 2.0 du 23 février 2021

Tests microbiologiques

Conditions préalables

- Personnel instruit pour la réalisation des prélèvements.
- Planification (p.ex. laboratoire, locaux)
- Mise à disposition du matériel
- Liste des endoscopes à contrôler
- Prélèvements aseptiques

Réalisation des prélèvements

Fréquence

- Retraitement manuel / semi-automatique : au moins une fois par an
- Retraitement automatique : au moins une fois par an

En outre, chaque endoscope utilisé doit subir un contrôle microbiologique au moins une fois par an (ou en cas d'incidents).

Directives suisses pour le retraitement des endoscopes flexibles. SSG/SSP/SSHH/ ASPE Version 2.0 du 23.02.2021

Précédent à l'Hôpital du Valais

Le Nouvelliste

14 janv. 2019, 12:14
/ Maj. le 14 janv. 2019 à 17:11

extrêmement rare, tout doute concernant une infection doit être levé. Pour cette raison l'Hôpital du Valais a contacté les quatorze patients chez qui l'appareil en question a été utilisé afin de le leur proposer une consultation et des analyses spécifiques en vue d'identifier ou d'exclure toute infection consécutive à son utilisation. Les coûts engendrés par les consultations, les analyses et un

Des bactéries ont été trouvées en quantité modérée sur un coloscope utilisé à l'Hôpital de Martigny. Ce sont des contrôles de routine effectués en décembre 2018 sur ces appareils utilisés pour les examens visuels du côlon qui ont permis de détecter ces microbes. Le retraitement appliqué selon la procédure en vigueur n'a pas permis de régler le problème et le coloscope en question a été immédiatement retiré et n'a plus été utilisé. Il a ensuite été envoyé au fabricant pour une révision détaillée. «Les contrôles sur tous les autres coloscopes se sont révélés normaux et se poursuivent selon les procédures appliquées de longue date à l'Hôpital du Valais», précise le HVS dans un communiqué.

Un précédent en 2014

Les microbes identifiés sur le coloscope en question ne seraient pas dangereux. «Mais on ne peut pas exclure que d'autres, comme des virus ne pouvant pas être recherchés sur le coloscope, aient contaminé cet appareil», précise le HVS qui estime que tout doute concernant une infection doit être levé, même si la transmission d'une maladie infectieuse par un coloscope demeure extrêmement rare. L'Hôpital du Valais a donc contacté les quatorze patients chez qui l'appareil en question a été utilisé afin de leur proposer une consultation et des analyses spécifiques en vue d'identifier ou d'exclure toute infection consécutive à son utilisation. Une information complémentaire sera diffusée aussitôt les résultats connus.

C'est la deuxième fois que l'Hôpital de Martigny doit faire face à un problème lié à l'utilisation d'un coloscope. En 2014, aucun des 40 patients concernés par cet appareil contaminé n'avait été infecté par un virus, ni HIV ni hépatite B ou C.

Pas d'infections liées au coloscope contaminé de Martigny

Aucun des 40 patients concernés par le coloscope contaminé de l'Hôpital de Martigny n'a été infecté par un virus, ni HIV, ni hépatite B ou C.

Martigny (District) | Bas-Valais | Santé

24 nov. 2014, 11:45

C'est à l'hôpital de Martigny que le coloscope comportant des microbes a été trouvé.
Le Nouvelliste/archives

Les consultations et analyses réalisées auprès de 40 patients en raison d'un problème rencontré avec l'appareil ayant servi pour leur coloscopie à Martigny ont permis d'exclure tout contact avec des virus, indique l'Hôpital du Valais dans un communiqué diffusé lundi. Aucun des patients concernés n'a été trouvé porteur des virus HIV ou de l'hépatite B et C.

Pour mémoire, les contrôles de routine effectués sur les coloscopes de l'hôpital de Martigny avaient révélé la présence de bactéries en quantité inhabituelle sur l'un des quatre appareils. Si les bactéries identifiées n'étaient pas dangereuses, on ne pouvait toutefois pas exclure que des virus ne pouvant pas être recherchés sur le coloscope aient contaminé l'appareil. Les analyses réalisées auprès des patients concernés ont permis d'écarter ce cas de figure. En effet, aucun d'entre eux n'a été trouvé porteur d'un virus qui aurait théoriquement pu être transmis lors de l'examen.

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Que recommandent les sociétés savantes?

Reprocessing of flexible endoscopes and endoscopic accessories used in gastrointestinal endoscopy: Position Statement of the European Society of Gastrointestinal Endoscopy (ESGE) and European Society of Gastroenterology Nurses and Associates (ESGENA) – Update 2018

8. Outbreak management

RECOMMENDATION

The clinical service provider should establish procedures detailing the management of any suspicious infection as well as suspected or identified breaches in reprocessing. The procedure should indicate the management of the potentially affected patients, staff, and equipment.

RECOMMENDATION

If any contamination is found, it is the responsibility of the clinical service provider to take the suspected piece of equipment out of service (e.g. endoscopes, EWD, ADD, storage cabinet, accessories, etc), until corrective actions have been taken and satisfactory results have been achieved.

RECOMMENDATION

Outbreaks should be managed within the multidisciplinary team of endoscopy departments, hospital hygiene experts, microbiologists, manufacturers, and regulatory bodies, if applicable.

Staff training, adherence to guidelines and manufacturers' IFUs, regular quality assessment with audits, regular microbiological surveillance, and validation of reprocessing cycles are important tools in the prevention of infections. European and national guidelines already provide helpful flowcharts concerning outbreak management [6, 9, 12].

SSHH: *«Rückverfolgung/Screening HIV, Hepatitis B und C kam nur in Frage bei einem groben Fehler bei der Aufbereitung des Endoskops (…). Dann primär Testung des Indexpatienten und erst im Nachgang mögliche exponierte Personen, falls ein positiver Befund vorlag.»*

Directives suisses pour le retraitement des endoscopes flexibles. SSG/SSP/SSHH/ ASPE Version 2.0 du 23.02.2021
Bonnes pratiques suisses de retraitement des dispositifs médicaux. SSSH/SSHH/Swissmedic. Version 2022
Beilenhoff U, et al. Endoscopy. 2018 Dec;50(12):1205-1234

American Society for Gastrointestinal Endoscopy

GUIDELINE

Infection control during GI endoscopy

Reprocessing failure

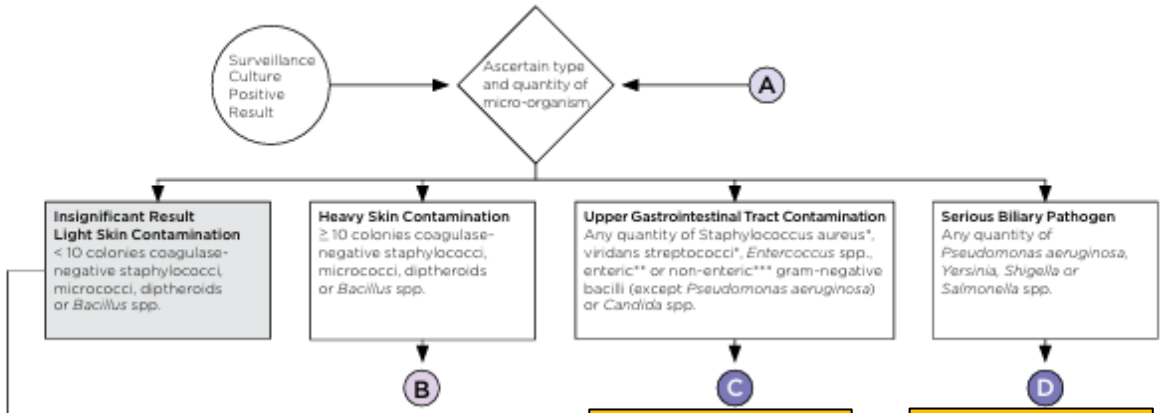
Reprocessing failures typically arise because of equipment (automated endoscope reprocessor) or product (HLD) failure or because of human error.[101] Because the efficacy of manual cleaning and HLD is operator-dependent, assignment of staff responsible for endoscope reprocessing, extensive training of the reprocessing personnel, process validation, and quality assurance cannot be overemphasized. Staff competency should be assessed, at the very least, on an annual basis.

Although the risk of transmission of infection through endoscopy is extremely low, institutions have an ethical obligation to inform affected patients in a timely manner when a significant breach in reprocessing is discovered or an endoscope-associated infection is suspected. Prompt notification and counseling may minimize patient anxiety, allow patients to take precautions to minimize the risk of transmitting infection to others, and allow for early serologic testing. This may help distinguish chronic infections from those potentially acquired at the time of endoscopy and to permit earlier initiation of treatment for newly acquired infections.

the management of cases of reprocessing failure: (1) When a breach of the HLD protocol is discovered, it should be reported to the institution's designated infection control personnel, local and/or state public health agencies, the FDA, the CDC, and the manufacturers of the involved equipment (eg, endoscope, disinfectant and/or sterilant, and automated endoscope reprocessor).[102,103] (2) Patients at risk should be notified directly, in a timely manner, of the breach and of the estimated risk of infection. Successful notification or attempts at notification should be documented. (3) Early serologic testing is imperative to distinguish prior infections from those potentially acquired as a result of the breach in the HLD protocol. For cases in which testing is delayed, it may be difficult to exclude the endoscopic procedure as a potential source of the infection. (4) Patients should be advised against donating blood and tissue products and engaging in sexual contact without barrier protection until all serologic testing is complete. (5) Personal counseling should be offered to all patients. The risk of infection should be discussed and placed in context, to minimize patient anxiety. In addition, the possibility that the patient has a prior chronic viral infection should be discussed, along with the role of testing in distinguishing pre-existing from newly acquired infections. (6) Patients should be asked whether they developed new symptoms suggestive of transmission of enteric bacteria or viruses after the endoscopic procedure. Prior vaccination history for hepatitis A and B should be documented. If patients have undergone prior hepatitis B vaccination, post-vaccination titers should be documented if they were measured. An attempt should be made to identify risk factors for hepatitis B, hepatitis C, and HIV. If patients have previously undergone testing for these infections, the results should be documented. (7) Baseline serologic testing for hepatitis B, hepatitis C, and HIV should be performed after reprocessing failure. Patients should be informed about their baseline serology results in a timely manner. (8) Performance of repeat testing, which may include serology and RNA tests, should be considered. The timing and the choice of tests will be influenced by the period of time that has elapsed between patient exposure and initial testing, by the presence or absence of patient symptoms, and by the advice of the institution's infectious diseases specialist. Institutions may consider obtaining follow-up testing at 6 weeks, 3 months, and 6 months after the procedure. In some situations, additional follow-up testing may be advisable at 1 year after exposure.

ASGE Quality Assurance in Endoscopy Committee. Gastrointest Endosc. 2018 May;87(5):1167-1179

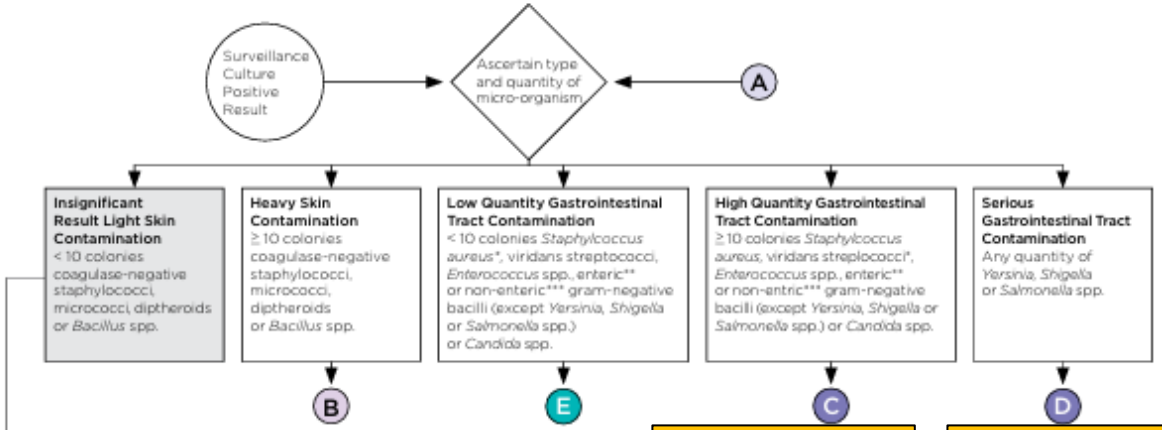
Response to positive duodenoscope cultures



Patient recall may be indicated

Commence patient recall process

Response to positive gastroscope or colonoscope cultures



Patient recall may be indicated

Commence patient recall process

General principles of patient recall and testing

a) Nominate a spokesperson for the group.
b) Maintain a document register or 'trail'.
c) Prepare written information regarding the problem, risks involved, rationale for action, how testing will be undertaken and how and when results will be made available.
d) Contact affected patients early to inform them of the problem and the estimated risks. Successful notification or attempts at notification should be recorded.
e) Apologise for the problem and emphasise the low risk of transmission of infection.
f) If patient testing is indicated, the earlier this is done the better. Early identification of affected patients may expedite treatment, reduce the risk of further transmission and aid epidemiologic investigation. Early serological testing may help distinguish patients whose blood borne virus infection was pre-existing from those who acquired the infection through endoscopy.
g) Patients at risk of blood-borne infections should be advised not to donate blood or tissue products or engage in sexual activity without barrier protection until serological testing is complete.
h) Inform relevant staff within the organisation, General Practitioners in the area, health authorities and industry (e.g. AFER suppliers) representatives.
i) If appropriate, make available a free video, telephone information line or one-to-one counselling service for patients and staff.
j) The cost of patient recall and testing may be borne by the facility responsible for the problem, the local health authority or the manufacturer of faulty equipment.
k) If the media are to be notified, ensure that patients are notified first. Prepare a media release in anticipation of media interest.

What to test for

a) Blood-borne viruses (BBV) (hepatitis B, hepatitis C, HIV) for patients who have had endoscopy around the time of suspected or proven endoscopy-related transmission of any micro-organism, a high-risk defect in equipment or breakdown in protocol, or a cluster of positive surveillance cultures that indicate a major defect in equipment or breakdown in protocol. Chase up records of previous blood-borne virus testing or vaccination. Perform baseline and follow-up testing according to local protocols for BBV exposure.

Defect in equipment or product or breakdown in protocol	Stop using any defective equipment or products. Impound any items that may not have been properly reprocessed. Correct the defect or protocol.	• Determine the approximate duration of the problem. • Determine how serious the problem has been in terms of patient risk (review endoscopy unit documentation, compliance with protocols and surveillance cultures for the duration of the problem). Note that many processes have margins for error – a fault in your equipment or protocol may not indicate significant patient risk. • Determine the cause of the problem. • If significant problem, consider notification and review or testing of patients at risk.

Gastroenterological Society of Australia

Clinical Update

ACIPC

Infection Prevention and Control in Endoscopy 2021

Patients who had an endoscopy around the time of suspected or proven endoscopy-related transmission of any microorganism, a high-risk defect in equipment or breakdown in protocol, or a cluster of positive surveillance cultures that indicate a major defect in equipment or breakdown in protocol should be tested for blood-borne viruses (hepatitis B, hepatitis C, HIV).

The decision to recall and test patients at risk is difficult.

Benefits of patient recall and testing include:

a) Detecting patients with infection or colonisation, which may make it possible to treat that infection and/or prevent transmission to others;
b) Community and patient assurance that the clinicians and organisation are responsive and open.

Disadvantages of patient recall and testing include:

a) Publicity that follows recall and testing of patients may lead to unwarranted fear and avoidance of endoscopy in the community, leading to missed opportunities for diagnosis and treatment;
b) A small number of patients who are notified of a risk, even a very small risk, are reported to suffer "nervous shock;"
c) Patient follow up is costly in terms of time and other resources.

The resulting patient benefit is likely to be small as transmission of significant infection is rare even when an error in reprocessing occurs[297,298,299].

a)It often is uncertain how long an identified problem has existed; patients who had their endoscopic procedure before the problem developed may be unnecessarily recalled and tested.

b) Patients with previously undiagnosed blood-borne virus infection may falsely attribute this to the endoscopy.

GESA. Clinical Update Infection Prevention and Control in Endoscopy 2021 https://www.gesa.org.au
Infection control in endoscopy (Gastroenterological Society of Australia / Gastroenterological Nurses College of Australia, 2011

Any investigation should be undertaken using a standardized approach. Rutala et al.[174] have described a process for exposure investigation after potential failure of a disinfection/sterilization procedure. **Table 8** outlines steps to be taken to investigate a reprocessing problem. Every situation is unique, therefore steps taken in the investigation should be adapted to the specific situation. In addition, the American Society for Gastrointestinal Endoscopy (ASGE) has recently published guidelines for patient notification and follow-up when a significant breach in reprocessing has been discovered[175].

Table 8. Investigation of a Reprocessing Problem

1. Confirm disinfection or sterilization reprocessing failure (e.g., review time and date of possible failure, sterilization method used, process parameters, and physical, chemical, biological indicators).
2. Impound any improperly disinfected/sterilized items.
3. Do not use the questionable disinfection/sterilization unit (e.g., sterilizer, AER) until proper functioning can be assured.
4. Inform key personnel (e.g., medical and nursing director of involved unit, risk management).
5. Conduct a thorough evaluation of the cause of the disinfection/sterilization failure (e.g., review exact circumstances of failure: dates and results of process measures, physical, chemical, biological indicators).
6. Prepare a line listing of potentially exposed patients (e.g., name, identification number), date of exposure, contaminated device used, underlying risk factors for infection, development of any healthcare-associated infections, or other adverse events.
7. Assess whether disinfection/sterilization failure increases patient risk for infection.
8. Inform expanded list of personnel of the reprocessing issue (e.g., administration, public relations, legal department).
9. Develop a hypothesis for the disinfection/sterilization failure and initiate corrective action.
10. Develop a method to assess potential adverse patient events (e.g., laboratory tests for source patients and exposed persons to blood borne pathogens).
11. Consider notification of provincial and federal authorities.
12. Consider patient notification.
13. Develop long term follow-up plan (e.g., long-term surveillance, changes in current policies and procedures).
14. Prepare after action report.

CDC. Monitoring hospital-acquired infections to promote patient safety. MMWR 2000;49:149-53
Public Health Agency of Canada. Infection Prevention And Control Guideline for Flexible Gastrointestinal Endoscopy and Flexible Bronchoscopy. 2010

Que rapporte la littérature sur le risque de transmission de HCV par un DMR insuffisamment désinfecté?

HCV

Reference	Design	N	Reprocessing guidelines followed	Follow up	Evidence of transmission	Conclusion	Notes
Ciancio, 2005	Prospective multicentric cohort study	8260 of 9008 at-risk patients; 9188 patients undergoing digestive endoscopy	Yes	6 months	No	When currently accepted reprocessing guidelines are followed, transmission of HCV is extremely rare to non-existent	912 patients underwent endoscopy with the same instrument previously used on HCV carriers
Mikhail, 2007	Single-center prospective cohort study	149 of 249 at-risk patients; 859 patients undergoing upper GIE	Yes	3 to 10 months	No	No transmission of HCV despite extremely high exposure risk in this cohort	Overall prevalence of anti-HCV in the cohort 71%
Morris, 2006	Systematic review of 31 articles; 13 articles related to HCV		No (prior to the comprehensive endoscope decontamination guidelines)		2 probable HCV transmissions (*Bronowicki et al.); 5 cases could not be concluded as associated with the procedure (other risk factors)	Transmission risk of HCV at endoscopy is low, even with inadequate decontamination procedures	Bias : only published literature; infection with blood-borne viruses subclinical; poor risk factor ascertainment i.v. drug; mainly individual case reports and case series reports
*Bronowicki, 1997	Case report	HCV may have been transmitted from a HCV-positive patient to 2 other patients undergoing colonosopy	No	HCV infection 7 months after colonoscopy	Probable	2 previously HCV-negative patients became HCV positive 3 months after colonoscopy	Inadequate aseptic techniques raise the possibility of HCV transmission via contaminated i.v. tubing, syringes, or multi-dose vials rather than the endoscope itself (Clin Infect Dis 2010;51:267-73; MMWR 2003 Sep 26;52(38):901-6)
Vanhems, 2006	Case report and follow-up investigation	197 of 236 persons exposed to an endoscope processed in a flawed EWD	No	6 months	No	No cases of HIV, HCV, HBV infection were observed	Worst-case scenario considered; Communication with the media

Ciancio A, et al. Ann Intern Med. 2005 Jun 7;142(11):903-9
Mikhail NN, et al. Gastrointest Endosc. 2007 Apr;65(4):584-8
Morris J, et al. J Hosp Infect. 2006 May;63(1):1-13
*Bronowicki JP, et al. N Engl J Med. 1997 Jul 24;337(4):237-40
Fischer GE, et al. Clin Infect Dis. 2010 Aug 1;51(3):267-73
CDC. MMWR Morb Mortal Wkly Rep. 2003 Sep 26;52(38):901-6
Vanhems P, et al. Infect Control Hosp Epidemiol. 2006 Jan;27(1):89-92

Que rapporte la littérature sur le risque de transmission de HBV DMR insuffisamment désinfecté?

HBV

Reference	Design	N	Reprocessing guidelines followed	Follow up	Evidence of transmission	Conclusion	Notes
McDonald, 1976	Case report and follow-up investigation	4 patients shared the same gastroscop as a HBV positive patient	No (1976)	6 months	No	Routine cleansing procedures may prevent passage of hepatitis virus	
McClelland, 1978	Case report and follow-up investigation	6 patients shared the same gastroscop as a HBV positive patient	No (1978)	6 months	No	No HBV-seronegative patients developed clinical or serologic evidence of hepatitis B	
Morgan, 1978	Case report and follow-up investigation	21 patients shared the same gastroscop as a HBV positive patient	No	6 months	No	The risk of transmitting HBAg via a contaminated endoscope must be small	
Moncada, 1978	Prospective surveillance study	199 patients	No (1978)	6 months	No	Meticulous cleaning and disinfection of endoscopes may diminish the risk of hepatitis B transmission	Inadvertent contamination of endoscopes with blood and saliva from HBsAg-positive patients occurs frequently (1.5% of 199)
Chiaramonte, 1983	Prospective study, 2 centers	623 patients undergoing upper GIE	No (1983)	6 months	No	Risk of HBV spread during upper GIE is very low, even in high prevalence areas	AntiHBc prevalence 56.6%
ASGE Quality Assurance in Endoscopy Committee, 2018	Systematic review	4 prospective studies (*Hoofnagle et al., **Ayoola et al., ***Villa et al., ****Lok et al.) including 722 high-risk patients undergoing endocopy	No (1980-1987)	12 months	No	Only 3 of the 722 patients seroconverted. None of them were attributed to the endoscopy	HBsAg prevalence 9.6%. The seroconversion rate was lower than that for a control population not undergoing endoscopy.

McDonald GB, et al. Gastrointest Endosc. 1976 Feb;22(3):168-70
McClelland DB, et al. Br Med J. 1978 Jan 7;1(6104):23-4
Morgan AG, et al. Br Med J. 1978 Feb 11;1(6109):369

*Hoofnagle JH, et al. J Clin Gastroenterol. 1980 Mar;2(1):65-9
**Ayoola EA. Gastrointest Endosc. 1981 May;27(2):60-2
***Villa E, et al. Gastrointest Endosc. 1984 Feb;30(1):15-7
****Lok A, et al.. J Gastroenterol Hepatol 1987;2:175-90.

Moncada RE, et al. Gastrointest Endosc. 1978 Aug;24(5):231-2
Chiaramonte M, et al. Hepatogastroenterology. 1983 Oct;30(5):189-91
ASGE Quality Assurance in Endoscopy Committee. Gastrointest Endosc. 2018 May;87(5):1167-1179

HBV

Reference	Design	N	Reprocessing guidelines followed	Follow up	Evidence of transmission	Conclusion	Notes
Mikhail, 2007	Single-center prospective cohort study	149 of 249 HCV at-risk patients; 859 patients undergoing upper GIE	Yes	3 to 10 months	No	None of the 30 seronegative patients undergoing endoscopy with instruments previously used in patients HBsAg+ seroconverted	Overall prevalence of anti-HCV in the cohort 71%
Willmore, 2015	Retrospective cohort study	5042 of 6728 living patients	No (endoscopy reprocessing failures over a 9-year period identified during an inspection)		No	Endoscopy reprocessing failures were not associated with an increased risk for blood-borne virus (HBV, HCV, HIV) among individuals tested	Communication with the media
Morris, 2006	Systematic review of 31 articles; 20 articles related to HBV	431 of 537 at-risk patients		≥6 months	1 probable (*Birnie et al.) HBV transmission; 2 cases could not be concluded as associated with the procedure	Although transmission of hepatitis B may occur following failure to decontaminate the endoscope adequately, it is likely to be low	Most of these articles were written in the 1970s and 1980s when endoscope decontamination procedures were less robust than those accepted as good practice today.
*Birnie, 1983	Caser report	5 patients endoscoped following a patient who became HBsAg positive 9 days after upper GIE	No (1983)	4 months	Probable	1 previously HBV-negative patients became HBV positive 96 days after endoscopy	Index patient had profuse bleeding from oesophageal varices. Subtype of the index case and the positive patient were the same (30% of the subtypes in Scotland)

Mikhail NN, et al. Gastrointest Endosc. 2007 Apr;65(4):584-8
Morris J, et al. J Hosp Infect. 2006 May;63(1):1-13
Willmore J, et al. Can J Infect Dis Med Microbiol. 2015 Mar-Apr;26(2):77-84
*Birnie GG, et al.Gut. 1983 Feb;24(2):171-4

Que rapporte la littérature sur le risque de transmission de HIV par un DMR insuffisamment désinfecté?

Aucune transmission endoscopique du HIV

- Le HIV est sensible à de nombreux désinfectants chimiques, y compris les aldéhydes, mais si le virus est protégé par un coagulum de protéines séchées, les désinfectants chimiques peuvent ne pas inactiver le virus → **nettoyage manuel** scrupuleux indispensable afin d'éliminer toutes les traces de sang et de matières protéiniques de l'équipement.
- Le nettoyage manuel de l'endoscope avec un détergeant permet d'éradiquer >99,0% du virus de l'instrument. Il a été montré qu'une désinfection ultérieure au glutaraldéhyde éliminait le virus des endoscopes.
- A ce jour, **aucune transmission endoscopique du HIV** n'a pas été rapportée dans la littérature.

ASGE Quality Assurance in Endoscopy Committee. Gastrointest Endosc. 2018 May;87(5):1167-1179
Hanson PJ, et al. Gut 1990;31:657-9
Classen M, et al.. Endoscopy 1988;20:128
Hanson PJ, et al.. Lancet 1989;2:86-8
GESA. Clinical Update Infection Prevention and Control in Endoscopy 2021 https://www.gesa.org.au

Evidence

BIAIS DE NON-PUBLICATION!

- **HCV**
  - Bonne évidence montrant un risque négligeable de transmission par un endoscope flexible retraité selon les recommandations
  - 2 cas de transmission par endoscopie publiés alors que les techniques aseptiques étaient inadéquates
- **HBV**
  - Bonne évidence montrant un risque négligeable de transmission par un endoscope flexible retraité selon les recommandations
  - 1 cas de possible transmission par endoscopie publié antérieurement aux standards de retraitement actuels
- **HIV**
  - Aucune transmission endoscopique publié

- Les infections rapportées lors d'endoscopie résultent principalement du non respect des recommandations de retraitement des endoscopes lié à:
  - Absence de protocoles de retraitement précis
  - Nombre insuffisant d'endoscopes
  - Temps très court entre deux examens d'endoscopies
  - Complexité du matériel à traiter
  - Matériel défectueux
  - Manque de contribution des services de prévention et contrôle de l'infection

Conclusion

- En raison notamment du biais de non-publication et de l'absence de grandes études prospectives multicentriques de longue durée, l'évidence n'est certes pas suffisante pour être formelle à 100%.
- Cependant, pour autant que les **protocoles de retraitement soient respectés**, il apparaît que:

  - le **risque de transmission de virus transmissibles par le sang (HCV, HBV, HIV) est négligeable**
  - il **ne justifie pas le rappel de patients potentiellement exposés** lorsque les contrôles microbiologiques de routine montrent la présence de germes dans les prélèvements.

VOS AVIS ET EXPERIENCES?