Reviewer's report

Title: Comparative cost-efficiency of the EVOTECH Endoscope Cleaner and Reprocessor versus manual cleaning plus automated endoscope reprocessing in a real-world Canadian hospital endoscopy setting.

Version: 3 Date: 23 May 2011

Reviewer: Lawrence Muscarella

Reviewer’s report:

Discretionary revisions:

1. The authors have adequately addressed the reviewer’s comment #1.

2. The authors stated in reply to my original comment that: “The reviewer is correct in that the time required to reprocess colonoscopes is longer because of the complexity of the colonoscopes where there are three channels to manually brush in the colonoscope and only a single channel in the bronchoscope. No change was made to the manuscript to explain this. It is assumed that readers of the paper would be aware of the physical differences between the endoscope types.”

The review agrees that the time to reprocess a colonoscope manually, compared to a bronchoscope, would be longer, due to the former endoscope’s physical complexity. But the reviewer does not concur with the authors that readers of the manuscript would know why, for example, the Medivators DSD-201, an automated and presumably standardized process, would require more time to reprocess colonoscopes (49.88 minutes) than bronchoscopes (42.43 minutes). Specifically, it is unclear to this reviewer why the Medivators DSD-201’s automated process would cause its time to reprocess a bronchoscope to be approximately 7 minutes less.

The authors note in the revised manuscript that: “the longer processing time for colonoscopes compared with the other scope types reflected the time required for an additional tap water rinse.” Please clarify that this is a change to the manuscript and why the Medivators DSD-201’s number of water rinses would depend on the type of endoscope being reprocessed.

3. The authors have adequately addressed the reviewer’s comment #3.

4. The authors are requested to clarify in their manuscript that the Evotech ECR is no longer the only reprocessor device in the U.S. to be cleared by the FDA to eliminate manual pre-cleaning of the endoscope prior to its automated processing. Another of Medivators’s endoscope-reprocessing models (the Advantage Plus) was recently cleared with the same claim as the Evotech ECR’s.
While such a clearance may not be as important to a device’s legal use in Canada as in the U.S., it is reasonable to ask the authors to discuss and clarify for the reader whenever an implication or consequence of this manuscript’s results and conclusions may not be the same in the two countries.

5. The authors have noted in their reply to the reviewer’s original comment that: “We agree with the reviewer’s statement and we have referred readers to an actual practice clinical effectiveness evaluation of EVOTECH ECR conducted by Alfa et al. (Alfa MJ, Degagne P, Olson N, Fatima I. EVOTECH® endoscope cleaner and reprocessor (ECR) simulated-use and clinical-use evaluation of cleaning efficacy. BMC Infectious Diseases 2010;10:200 (doi:10.1186/1471-2334-10-200).)”

This article by Alfa et al. (2010) is incomplete, however, and it has been corrected. The authors are asked to reference in their manuscript, in addition to this article, the following reference/correction:


6. The authors have adequately addressed the reviewer’s comment #6.

Minor essential revisions:

1. The authors have adequately addressed the reviewer’s comment #1.

2. Based on their reply, the authors are respectfully requested to clarify for the reader that its revised manuscript’s calculations, cost analysis and conclusions are based on labor costs in Canada and, therefore, may not be applicable to the Evotech ECR’s use in the U.S. or another country.

Alternatively, the authors would include in their revised manuscript their reply to this reviewer’s original comment – namely, “Information on the cost implications for the U.S. was not included in this study. The authors concluded that a discussion of the cost implications for the U.S. would be out of place in a study reporting on actual practice and costs in Canada. If U.S. reviewers would like to understand the cost implication of the labour savings in the U.S., they could estimate the U.S. labour cost savings by multiplying the hours saved with EVOTECH ECR by their own institutional technician per hour labour cost.”

3. The authors have adequately addressed the reviewer’s comment #3.

4. The authors appear to have adequately addressed the reviewer’s comment #4, although they are asked to mention briefly in the manuscript why, if the immersion time of the Cidex OPA disinfectant was 5 minutes, its immersion temperature was not 25° C as indicated on its labeling (in the U.S.), but rather “28-29°C.” The reason for this elevated temperature is unclear.
Major compulsory revisions:

1. The authors’ comments are appreciated, but their manuscript’s focus and conclusion that the annual costs of using the EvoTech ECR are less than the Medivators DSD-201’s, as well as their statement that “the purpose of this economic evaluation was to determine the cost-efficiency of using the EVOTECH ECR versus another disinfection system, Medivators DSD-201, by comparing the total costs, including labour and consumable supplies, involved in using each reprocessor in an actual clinical practice setting in Canada,” would seemingly require including as a footnote in Table 7 the authors’ estimate of the initial purchase price of both the Evotech ECR and Medivators DSD-201 models. Alternatively, the authors would include as a footnote in Table 7 a statement, like this table’s other footnote, to the effect that: “*Does not include the initial purchase price of either device.”

If it were not to include in its calculations an estimate of the initial purchase price of both compared models, then the manuscript would be arguably incomplete, and the validity of its comparison of the total costs of the Evotech reprocessing device, compared to the Medivators DSD-201, or its conclusion that “the Evotech was … less costly to use for the reprocessing of endoscopes than the Medivators DSD-201” might be in doubt. It is important that such a comparative cost analysis as this manuscript’s include all germane costs – including both devices’ respective initial purchase cost.

The authors note in their reply that: “We agree with the reviewer that the study did not include the reprocessor purchase price and the annual cost of maintenance contracts. We have removed reference in the manuscript to the capital costs.”

Rather than removing this reference – in fact, it is requested that this be reinsert in the manuscript, – the authors are asked to discuss differences in the estimated initial purchase price between the Evotech ECR and the MediVators DSD-201 and how these differences might impact the revised manuscript’s conclusions, in general, and the following two, in particular: first, The EVOTECH ECR was more efficient and less costly to use for the reprocessing of endoscopes than manual cleaning followed by (disinfection using the Medivators DSD-201); and, second, “the increased efficiency with EVOTECH ECR could lead to even further cost-savings by shifting endoscopy laboratory personnel responsibilities but further study is required.” If the authors cannot estimate the initial purchase price of either device in Canada, then a comparison of their respective costs in the U.S. or another country of choice is recommended.

Although less suitable, the authors could alternatively discuss in the manuscript the following text, along with its implications: “the study did not include the reprocessor purchase price and the annual cost of maintenance contracts, the primary reason for which is that, in Canadian hospitals, the operating budgets do not cover capital costs and vice versa. The target audience for this paper is hospital decision makers interested in operating costs. A secondary reason for
excluding the capital purchase price of the reprocessors was the fact that, although prices appear to be publicly available in the U.S., comparative pricing was not available for Canada.” This text is important to this manuscript’s discussion.

2. The authors provide an important footnote in the revised Table 5 stating that: “Although a less costly disinfectant (such as glutaraldehyde) may be in use in other centres, they were not in use at this site and are no longer commonly used because of their association with occupational disease among cleaning personnel [23].”

This rationale presents a slippery slope. The authors are asked to clarify that their statement that they “are no longer commonly used” is referring specifically to glutaraldehyde-based disinfectants (or instead to “a less costly disinfectant”) in Canada. (That glutaraldehyde-based disinfectants remain in use in the U.S. is noted.)

Moreover, if such a statement about occupational disease is to be included in the revised manuscript vis-à-vis, for example, glutaraldehyde, then, for balance, the authors are asked to clarify whether the Evotech ECR is contraindicated for reprocessing urological instrumentation (e.g., cystoscopes) used to treat patients with a history of bladder cancer. Reports have linked anaphylaxis-like reactions among this subclass of patients to the use of Cidex OPA (which is the active ingredient of the Evotech ECR’s single-use disinfectant) to reprocess urological equipment used repeatedly on these patients.

3. The authors wrote: “We agree with the reviewer’s comment that manual cleaning is required in cases of emergency procedures (i.e., patients were not properly prepped prior to the procedure) and where soiled endoscopes are not reprocessed within one hour after their clinical use. Information was available in the introduction section of the manuscript to describe this; however, we have also repeated this information in the discussion section to ensure that readers understand the impact that the manual cleaning requirement in these two scenarios would have on the overall costs.”

In reply, the authors are requested to include in the manuscript not just an acknowledgement of these two limitations of the Evotech ECR’s, but also an estimation of the potential financial impact of both on the manuscript’s calculations and conclusions. Inclusion in the manuscript of this acknowledgement and estimation are important to ensure that its results do not feature a measurement bias that might skew its conclusions favoring the Evotech ECR’s device (one of the manuscript’s authors is employed by Johnson and Johnson Medical Companies, a division of which manufactures and markets this Evotech device).

The manuscript would lack objectivity if it were to have omitted factors (e.g., the financial costs associated with manual cleaning of those types of flexible endoscopes that the Medivators DSD-201 can reprocess, but that the Evotech ECR cannot; or, the initial purchase price of the Medivators DSD-201, which
reportedly is significantly less than the Evotech ECR) that would reduce the financial benefits and enhanced efficiency of the Evotech ECR, compared to the Medivators DSD-201.

The authors also state that: “With respect to the types of scopes that can and cannot be reprocessed with EVOTECH ECR, EVOTECH ECR can reprocess most scope types including ERCP scopes, enteroscopes and videoscopes; however, double biopsy channel scopes and ultrasound scopes must be reprocessed in another manner. A sentence was added to the discussion to state that the EVOTECH ECR cannot reprocess all scope types.”

The authors are asked to note in the manuscript, not just that “the EVOTECH ECR cannot reprocess all scope types,” but that, if true, it cannot reprocess double biopsy channel scopes and ultrasound scopes, which appear to be the only two.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I have previously declared that I am employed by a manufacturer whose products may be in competition with the two discussed in this manuscript. This association does not bias me in favor of either one over the other.