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The authors reply.

Dr. Tietz and his associates state that the values in the figure do not correspond with statements in the text. In fact, they do. Although the lines of the graph may appear to reach zero in accordance with the statement by Dr. Tietz and his associates, in actuality, 10^5 *Pseudomonas aeruginosa* gave 2,135 RLUs, 10^6 *Escherichia coli* gave 1,369 RLUs, 10^3 *Candida albicans* gave 582 RLUs, and 10 red blood cells gave 14,274 RLUs. All were within the detectable range of the instrument. In addition to the quantitative data listed, quantitative studies were also performed with *Staphylococcus xylosus*, *Erysipelothrix rhusiopathiae*, *Enterococcus durans*, *Streptococcus bovis*, *Streptococcus pyogenes*, *Staphylococcus aureus*, and *Streptococcus pneumoniae*. Data from these studies were presented to the editor as a note in proof, but were omitted from the publication because they provided no additional significance to the data given.

We chose not to mislead readers into thinking that the bioluminescence assay is an exact quantitative measurement of colony-forming units. At least in our laboratory, we could not demonstrate precise quantitative numbers using this assay. The results we obtained for RLUs did, however, demonstrate approximate numbers of organisms on the logarithmic scale that best indicated high versus low microbial load.

The culture of endoscopes in this study included brushing the internal channels and the exterior of the endoscopes to dislodge any organisms. All were cultured or tested by gene probe technology. Therefore, the sampling for cultured endoscopes was the same as for the LUM-T assay with the exception that the entire internal channel was not sampled for the LUM-T assay. Five endoscopes that had negative results on the LUM-T assay were also cultured and had negative results. These five endoscopes served as the negative control, and if the sterile water used to rinse endoscopes had been contaminated, cultures would have revealed this. Therefore, the culture of the sterile water as suggested by Dr. Tietz and his associates is irrelevant.

We agree with Dr. Tietz and his associates that the cutoff values for sterile, clean, and contaminated were based on our observations, and we stated in the article that "other institutions may choose to set different limits based on their experiences with the LUM-T system."

High-level disinfection of endoscopes is a controversial issue. High-level disinfection does not equal sterility. Some argue that endoscopes should be rendered sterile and that only sterile endoscopes be used for patient care. Is this practical in the clinical setting?

Our findings showed that once endoscopes were reprocessed, they were not maintained in a sterile environment but rather a clean environment. Thus, our discussions with physicians indicated that some environmental contamination of endoscopes does reoccur prior to patient use. The level of recolonization then becomes a concern and an issue to be addressed. At what microbial load do we then deem an endoscope "improper for reuse?" How do we measure that in real time? Microbial culture of endoscopes requires days to weeks and is impractical. The bioluminescence assay can demonstrate contamination above that of normal skin flora and may prove to be the best rapid method available to demonstrate this phenomenon.

We have not stated or implied that a negative result on LUM-T assay equals sterility. The concept that not a single vegetative cell should exist on or inside the instrument before patient reuse is an idealistic one. We do not argue that conceptually sterility is the best practice, but rather that it is not the current standard. The question that then arises is whether it is feasible to create such standards. Unless standards are changed so that high-level disinfection imparts sterility and that sterility is maintained throughout storage and handling, we cannot ensure that infections will not arise from reprocessed endoscopes. Therefore, the decision to assume that all endoscopes are sterile because they have been high-level disinfected and to not monitor this process is misleading and possibly harmful.

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Epidemic Parenteral Exposure to Volatile Sulfur-Containing Compounds at a Hemodialysis Center

To the Editor:

In the March issue of *Infection Control and Hospital Epidemiology*, Selenic et al. reported that an epidemic became manifest during 30 minutes beginning approximately 1 hour after reverse osmosis units were returned to the treatment loop during dialysis of 16 patients.[1] Their symptoms included chills, nausea, vomiting, hypotension, hypoxemia, tachypnea, fever, leukopenia followed by leukocytosis with a profound left shift, toxic granulations, and Döhle bodies. Two patients died and two had positive blood cultures, one for *Citrobacter*. Some water samples at the site contained excess endotoxin, and others contained excess viable aerobic bacteria.

The authors obtained samples 6 days after the dialysis center had been closed and the reverse osmosis unit had been sitting without water circulation. A "sulfur" odor was detected, which had been noted only once previously by an attendant, and the presence of four sulfur compounds, which the authors note may have been generated by growth of anaerobic bacteria in the inactive reverse osmosis unit, was detected by gas chromatography and mass spectrometry.

The authors stated that this was the first reported hemodialysis outbreak linked to sulfide exposure. They reviewed the toxicology of the sulfides they detected, given by non-