

preserving landfill areas and maintaining air and water quality.

Although the results of our investigation suggest that modest cost reduction is possible from separation of noninfectious waste from the operating room, this is only a first step in finding solutions. We still feel very strongly, as we summarized in the article, that the use of separated bags for paper and plastic, along with recycling, can greatly reduce the burden on hospital personnel, incineration costs, and ultimately can decrease the burden on our environment. Reducing waste generation by the strategy of increasing use of reusables is certainly an area that must be explored in the future.

Alan David Kaye, MD, PhD
Tulane University Medical Center
New Orleans, Louisiana

Biohazardous Waste: Risk Assessment, Policy, and Management

To the Editor:

Dr. Keene's recent review¹ of *Biohazardous Waste: Risk Assessment, Policy, and Management*, by Wayne L. Turnberg,² has prompted our response in this letter to the editor. It is Dr. Keene's prerogative and obligation to advise Journal readers of his opinions of the merits of this text. Concomitantly, we believe that it also is essential for us, as professionals involved in the management of biohazardous waste, to present alternative views of Mr. Turnberg's work so as to provide a more balanced evaluation.

First, Dr. Keene repeatedly cautions readers throughout his review that "both the regulatory framework provided, and the technology of alternative treatment systems discussed, are in a constant state of flux." Taking the liberty of paraphrasing this statement, Dr. Keene would appear to be advising readers that the information contained in the text may be outdated and therefore of little current value. However, owing to the lengthy and tedious process involved in the publication of scientific works, this same criticism can be made about any reference text. A more positive view would note that there is no other single reference text presently available that contains such detailed informa-

tion on as great a diversity of alternative medical-waste-treatment technologies. Furthermore, Mr. Turnberg provides his perspectives on the numerous and highly variable local, state, and federal regulations dealing with the handling and treatment of this form of solid waste. Without this information, those interested in the processing of medical waste would have to contact individually more than 40 manufacturers of treatment systems in order to gather the data presented in Mr. Turnberg's text. Additionally, attempting to obtain legible and inexpensive copies of all applicable regulations would be an expensive and frustrating project. Mr. Turnberg has overcome all of the governmental hurdles for the readers. He presents the often-conflicting statutes and rules in a clear and concise manner and includes information to enable the readers to contact each state regulatory agency. We believe that readers of the Journal are sufficiently sophisticated to understand that treatment systems enter and leave the commercial marketplace and that regulations are subject to the proceedings, albeit impetuous actions, of state and federal legislators.

Second, Dr. Keene expresses a similar cautionary tone concerning the State and Territorial Association on Alternate Treatment Technologies (STAATT)³ guidance document and its inclusion in *Biohazardous Waste*. He points out in the summary of his review that, "Finally, the STAATT document, published in its entirety in this book, has not had a rigorous scientific peer review, nor has it been the subject of public comment. It should not be accepted as a basis for regulatory promulgation until it has been subjected to such review and comment." However, Dr. Keene fails to note that the STAATT guidance manual represents the combined efforts of over 20 state and federal regulators, as well as some of the most informed consultants in the area of biosafety and hazardous-waste management.

He does not inform the readers that the document was the first and only attempt, until the publication of *Biohazardous Waste*, to bring some degree of order and stability to a chaotic area after the sunset of the federal Medical Waste Tracking Act in the early 1990s. He also does not indicate that it required five separate 2- to 3-day conferences over 2 years

before the participants reached a consensus on standardized approaches for the regulatory oversight of all phases of biohazardous-waste management. Furthermore, Dr. Keene did not note that many of the members of the STAATT committee would be the same individuals who would be requested to provide peer reviews of the document. The review does not discuss the fact that the STAATT report has been adopted, either in part or in its totality, by many state regulatory agencies and those of several foreign governments.

Finally, the guidance document was published in 1994 and, except for the negative comments contained in Dr. Keene's review, has received positive responses from those concerned with handling, treating, and disposing of biohazardous waste.⁴ Consequently, rather than assuming Dr. Keene's negative view of the publication of the STAATT document in *Biohazardous Waste*, we believe that its inclusion can have only the positive consequences noted by Mr. Turnberg, ie, "The publication of this guidance document is an important step in establishing a network of state, local, and federal agencies all working toward the same goal; approving for use in their jurisdiction medical waste treatment and/or destruction technologies that are effective, reliable, environmentally friendly, and safe for workers and the public."

In summary, we believe that Dr. Keene's cautionary statements concerning *Biohazardous Waste* and the STAATT guidance manual are unwarranted and ill-founded. Additionally, we are concerned that this review may deter interested persons who may lack training and experience in this area of waste management from obtaining a text that represents a valuable resource for regulators, manufacturers, scientists and the public.

REFERENCES

1. Keene JH. A review of *Biohazardous Waste: Risk Assessment, Policy, and Management*. *Infect Control Hosp Epidemiol* 1997;18:530.
2. Turnberg WL. *Biohazardous Waste: Risk Assessment, Policy, and Management*. New York, NY: John Wiley and Sons, Inc; 1996.
3. State and Territorial Association on Alternate Treatment Technologies. *Technical Assistance Manual: State Regulatory Oversight of Medical Waste Treatment Technologies*. 1994.
4. Slavik NS. Use of germicides in medical waste treatment. In: Rutala WA, ed. *Chemical*

Germicides in Health Care. Morin Heights, Ontario, Canada: Polyscience Publications, Inc; 1994.

Ira F. Salkin, PhD

New York State Department of Health
Albany, New York

Edward Krisiunas, BS, MT, CIC, MPH

Spectrum
Burlington, Connecticut

Phillip R. Morris, BS

South Carolina Department of Health
and Environmental Control
Columbia, South Carolina

The author replies.

In response to Dr. Salkin's letter concerning my recent review of *Biohazardous Waste: Risk Assessment, Policy, and Management*, by Wayne L. Turnberg, I would like to say first that I have the utmost respect for Mr. Turnberg and his work. Mr. Turnberg and his associates, in their study of medical waste in the state of Washington, have produced perhaps the most in-depth study conducted to date of the potential hazards of medical waste. In the review's introductory paragraph, I stated that "In keeping with the stated purpose and the intended audience, the author provides an in-depth and critical discussion of potential medical-waste hazards, medical-waste handling procedures, and the regulatory framework surrounding treatment and disposal of medical wastes."¹ I also agree with Dr. Salkin, with the caveats discussed later, that the STAATT document could be an important guidance document for persons who must deal with the problems, both political and scientific, of medical waste.

I realize, as does Dr. Salkin, that reference books, such as Mr. Turnberg's, may contain some outdated information. Departments change, personnel change, telephone and fax numbers change, and one cannot necessarily rely solely on this type of reference source for such information. In consideration of the stated audience, I felt it was important to bring this to the reader's attention.

With regard to the various treatment technologies covered in the book, I cautioned potential readers to understand that "While this information is good from an historic perspective, it is subject to significant change as some technologies are discontinued

and others are introduced." In my opinion, it is important for a reviewer to ensure that the audience is informed of potential problem areas.

Dr. Salkin seems to think that Turnberg's book would simplify information retrieval regarding medical waste-treatment systems when he states that "Without this information . . . [one] would have to . . . contact more than 40 manufacturers . . ." In light of the timeliness of the information provided, I would encourage anyone who was interested in getting up-to-date information to do just that.

In addition, Dr. Salkin appears to be saying that Turnberg's book is a source of ". . . legible and inexpensive copies of all applicable regulations . . .". It is not. The book provides names and addresses of the various state departments and personnel that were responsible for medical-waste regulatory compliance, *applicable at the time of publication*. One would still have to contact appropriate federal, state, and local agencies to obtain copies of applicable regulations, a job more efficiently performed by looking in the local telephone book.

The major thrust of Dr. Salkin's concern appears to be regarding the reviewer's warning that a major portion of the book consists of the STAATT guidance manual,² which has not been peer-reviewed appropriately. Time and space do not allow for an in-depth discussion of the STAATT document in this rebuttal. I would, however, like to make a few pertinent points considering Dr. Salkin's statements regarding it.

1. I agree, as mentioned previously, that there are some sections of the STAATT document that do, in fact, serve to alert the reader to areas that should be addressed in the handling of medical waste. However, I also believe there are some areas, particularly those dealing with the microbiological testing of alternative treatment methods, that should be evaluated critically prior to being "cast in stone" in either state, local, or federal regulations.

2. Dr. Salkin states that the development of the document was a joint effort by over 20 state and federal regulators, and intimates that this is a consensus document. In fact, the core states only numbered 6 or 7, while the other 13 or 14 states were represented only at the final meeting of the group. At least 30 states were not represented in the development of this document.

My discussions with some of the participants indicated that there was not agreement among all of those in attendance as to either the content or the necessity for this particular document, another reason for further review and comment prior to publication and universal acceptance.

3. Dr. Salkin states correctly that I did not ". . . note that many of the members of the STAATT committee would be the same individuals who would be requested to provide peer reviews of the document." I know of no scientific journal that allows the authors of an article to review their own papers. There has been, to my knowledge, no published review of the STAATT document by members of the Society for Healthcare Epidemiology of America, the American Biological Safety Association, the American Society for Microbiology, the American Hospital Association, the Association for Practitioners in Infection Control, or any other like organization. I believe that the STAATT document should, at a minimum, have been sent out for review by persons who are knowledgeable in the field and were not involved in the document's development.

4. Dr. Salkin states that the STAATT document was ". . . the first and only attempt, until the publication of *Biohazardous Waste* to bring some order and stability . . . after the sunset of the federal Medical Waste Tracking Act . . .". Please note that the Agency for Toxic Substances and Disease Registry (ATSDR) report confirmed that medical waste was not a significant public health problem. The ATSDR findings and the fact that the federal Environmental Protection Agency did not expand the Act or develop new regulations should have indicated that a document such as this was not entirely necessary. The chaos Dr. Salkin was concerned about should have been stabilized by these facts.

5. Finally, the danger of publishing the STAATT document without some further review was demonstrated when at least one state incorporated a "draft" of the document into regulation without any external review, and in spite of public comment by knowledgeable people to the contrary, because "It is what everyone else is going to do, and we don't want to be the last"—an example of political pressure overcoming scientific reason.

In conclusion, I continue to praise Mr. Turnberg and his book with regard to the historical perspective provided for the handling of medical waste in an appropriate manner. However, I also would continue to caution the reader "... against unilateral acceptance of any single part of the recommendations . . . without

review of current, applicable state, local, and federal regulations . . .", and to push for peer review of the STAATT document.

REFERENCES

1. Keene JH. A review of *Biohazardous Waste: Risk Assessment, Policy, and Management*. *Infect Control Hosp Epidemiol* 1997;18:530.

2. State and Territorial Association on Alternate Treatment Technologies. *Technical Assistance Manual: State Regulatory Oversight of Medical Waste Treatment Technologies*. STAATT; 1994.

John H. Keene, DrPH
Biohaztec Associates, Inc
Midlothian, Virginia

Correction

Primary Prevention and Rubella Immunity: Overlooked Issues in the Outpatient Obstetric Setting

In the September 1997 issue of *Infection Control and Hospital Epidemiology*, there were two errors in the article "Primary Prevention and Rubella Immunity: Overlooked Issues in the Outpatient Obstetric Setting" (1997;18:633-636). This new correction supersedes the correction that appeared in the December 1997 issue (1997;18:808).

Page 634, column 2, line 22,

should have read, "Respondents from states with legal requirements for rubella immunity had a significantly higher rate of self-reported immunity compared to physicians from states without such laws (90.5% vs 78.7%, respectively; OR, 2.58; 95% confidence interval [CI₉₅], 1.70-3.92)."

Page 635, column 1, line 36, should have read, "The higher rate of immunity (90.5% vs 78.7%) among

physicians in states with legal requirements suggests that enacting legislation may improve rubella immune status among practicing physicians, but this should be interpreted with caution, because there is insufficient evidence that a legal requirement will assure immunity."

We apologize for any inconvenience these errors may have caused our readers.