Letters to the Editor

IV Filter Debate Continues

To the Editor:

I strongly disagree with Ms. Weinstein's conclusion (Product Commentary, May 1987, pp 220-221) that IV filters are not only justified but essential. The article starts out with an erroneous statement that is not referenced. Unless there is a new guideline of which I am not aware, the Centers for Disease Control (CDC) do not "weakly recommend the use of IV filters." The CDC strongly recommends *against it* in a Category II statement from 1981.[1] For those readers who are not familiar with the meaning of the CDC categories, Category II means that: "Measures in Category II are supported by highly suggestive clinical studies in general hospitals or by definitive studies in specialty hospitals that might not be representative of general hospitals. Measures that have not been adequately studied by have a logical or strong theoretical rationale indicating probably effectiveness are included in this category. Category II recommendations are viewed as practical to implement in most hospitals."

Ms. Weinstein states that many studies address IV fluid contamination but cites only one such study. Actually, very few infections are due to contaminated IV fluids, and in-line filters may increase the risk of fluid-related infection. Filters would trap the occasional organism and allow it to multiply on the filter membrane, resulting in release of toxins and septic shock.

Most organisms that cause IV-related infections originate at the IV catheter and skin junction and are from a contaminated catheter. Small numbers of bacteria that are intermittently shed into the bloodstream from other body sites, even in healthy individuals, can become trapped in the fibrin sheath that forms around the IV catheter. They may multiply there and can then be seeded into the bloodstream causing bacteremia, septicemia, and shock. Filters will not prevent these infections.

Another nonissue for the use of filters is air in the tubing. Nurses have prevented air from causing problems in many ways, and can continue to do so now without a new and costly device.

IV-related phlebitis is due to many causes. First and foremost is the low pH of the IV solution. Use of catheters versus steel needles is another cause. These and other causes have often been discussed. Also, comments and critiques regarding Dr. Falchuck's article (cited by Ms. Weinstein) were published in an editorial,[2] and in several letters to the editor, my own included.[3] Phlebitis, although it can be very uncomfortable, causes only minor morbidity in the majority of patients and does not justify an expenditure of $80 to $100 million a year in this cost-conscious era. Instead, proven methods of prevention should be followed. They consist of: (1) large volume filtration of admixtures in the pharmacy; (2) adequate dilution of "piggyback" medications; (3) slow administration of these additive mixtures, and (4) buffering IV solutions with heparin or hydrocortisone.

The statement that particulate matter from IV fluids causes "a myriad of conditions" is not referenced, nor are the statements and examples that follow. I am aware of the origins of these studies. They are old—prior to 1965—and describe animal experiments. They have not been corroborated in the past, are outdated, and are no longer applicable because particles such as those described in these studies are now filtered out during the manufacturing process. Particulate matter as a cause of phlebitis also is not a demonstrated problem in centrally delivered TPN solutions, especially if they are filtered at the site of admixing—in the pharmacy. I can, therefore, see no advantage to filters in that situation either. I would like to recommend, however, that manufacturers address the low pH of IV solutions, other than by having nurses add buffers at the time of administration. The problem of phlebitis would then probably disappear and patients would be spared the discomfort of this condition.

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REFERENCES

1. Centers for Disease Control: Guidelines for the Prevention of Intravascular Infections, 1981.
2. Friedland G: Infusion-related phlebitis—Is the in-line filter the solution? *N Engl J Med* 1985; 312:113-115.
3. Letters to the editor. *N Engl J Med* 1985; 312:1452-1454.
4. Tanner WA, et al: The influence of heparin on intravenous infusions: A prospective study. *Br J Surg* 1980; 67:311-312.

To the Editor:

I am writing about the quality of a recent article in *Infection Control* concerning IV filters.[1] I believe that the article is so biased and of such poor scientific quality that it should be followed by an opposing view. The article strongly suggests that IV filters are a standard of practice and says that the Centers for Disease Control (CDC) endorse the use of IV filters. In fact, the CDC opposes the use of these filters ("Using IV in-line filters is not recommended as a routine infection control measure. Category II.") I am disturbed by the medical-legal pressure created by the publication of such an article in a quality scientific journal. I feel that lawyers will use such an article to suggest that filters are a standard of care, especially since this journal published another article saying "filters should be an integral part of the IV administration set."[2] I don't believe that filters are a standard of care; I suspect that the large majority of SHEA (Society of Hospital Epidemiologists of America) members, for instance, do not work in hospitals that

routinely use filters. There is a lot of evidence to suggest that filters are not necessary.[3] None of this evidence was discussed in the recent article about filter usage. The article, supported by only six references, seemed most designed to voice an opinion rather than generate scientific discussion. One of the best articles supporting the use of IV filters[4] was not even mentioned. I would invite further discussion on this important topic.

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REFERENCES

1. Weinstein S: Intravenous filters. *Infect Control* 1987; 8:220-221.
2. Chrystal C: Selecting an IV tubing system. *Infect Control* 1985; 6:384-385.
3. Simmons BP: Alternatives to IV filter usage. *Infect Control* 1985; 6:342-343.
4. Quercia RA, Hills SW, Klimek JJ, et al: Bacteriologic contamination of intravenous delivery systems in an intensive care unit. *Am J Med* 1986; 80:364-368.

Ms. Weinstein responds to Ms. Gurevich and Dr. Simmons:

I appreciate the opinions voiced by Ms. Gurevich and Dr. Simmons concerning my Product Commentary on IV Filters. I will address one of Dr. Simmons' comments first: "The article is so biased and of such poor scientific quality that it should be followed by an opposing view." Perhaps, Dr. Simmons is unaware of the fact that a Product Commentary is not, nor is it intended to be, a "scientific paper." It is exactly what it states: "a product update," intended to stimulate discussion and interest on the part of the reader. Also, as familiar as Simmons is with professional publications, he must know that published material does not always reflect the view of the editor or publisher. If an editor were to publish *only* his or her own views, available reading material would be quite biased and limited, would it not? The editor of *Infection Control* should be applauded for recognizing the importance of sharing articles such as mine and Ms. Chrystal's with the readership. (Chrystal C: Selecting an IV tubing system. *Infect Control* 1985; 6:384-385.)

Contrary to Gurevich's interpretation, the article does not "start out with an erroneous statement that is not referenced." It begins with a description of the purpose of IV filtration, which is entirely correct. The CDC guideline states that "using IV in-line filters is not recommended as a routine infection control measure." A Category II classification is applied; this classification has already been explained by Gurevich as "that which has not been adequately studied but has a logical or strong theoretical rationale indicating probable effectiveness." I believe that the question is one of interpretation. While Gurevich is correct in that the Category II rating is not a *weak* recommendation, Category II is also not a *strong* recommendation. By her own admission, a Category II classification is inconsistent with her statement that the "CDC strongly recommends *against* it in a Category II statement from 1981." The CDC categorized the use of IV filters as "Category II: moderately recommended for adoption." The CDC's recommendations are often interpreted as contraindicating the use of IV filters, or indicating that such filters are worthless. It is apparent that the CDC's main area of concern is infectious disease, transmitted under normal circumstances. These comments apply to Simmons's criticism as well.

While no IV filter can replace good sterile technique, nor protect a patient against infection transmitted below it in the line or on the skin, the filter *can* protect against extraordinary, potentially catastrophic contamination of an IV solution or line by an opportunistic pathogen. My comments addressed this issue: "the filter is not a panacea; it should never be considered a substitute for quality care and excellent technique." The filter additionally can protect the patient against the particulate matter seen in all IV infusions; this is the primary use of IV filters today. My article did point out that "while filters can undoubtedly reduce phlebitis due to particulate or chemical substances, studies to prove their value in clinical infection have not yet been done." Gurevich's concerns address the subject of clinical infection; because I stated that these studies had not yet been done, her criticism lacks substance.

As far as her comments relevant to IV fluid contamination, Gurevich again misread my material. I cited two studies, both Rapp (a classic in IV filtration and elimination of which would have been inappropriate and unjustified), and Falchuk, whose study addressed not only phlebitis, but *microparticulate-induced phlebitis* resulting from particulate contamination of IV fluids. Again, Gurevich refers only to infections; infections were not the subject of my manuscript although I briefly addressed the fact that "most studies indicate that infection is associated with the insertion site and the use of the IV cannula, areas that can be enhanced by excellent technique on the part of the IV specialist." I make no attempt here to weigh the merits of steel needles over IV catheters. I state instead that insertion of any IV infusion device should be limited to those who have been properly trained in the use of such products and that the quality of IV care is enhanced when an IV team is responsible for the delivery of such care. As far as the "nonissue for the use of filters is air in the tubing," I challenge Ms. Gurevich to publish "the many ways that nurses have prevented air from causing problems." One need only do a literature search to recognize the plethora of court cases citing infusion of air into the bloodstream as a cause of malpractice litigation and the patient's injury or demise. I have testified as an expert witness in several of these cases, and I can only assume that Ms. Gurevich is uninformed on this matter.

Ms. Gurevich is correct that "IV-related phlebitis is due to many causes." I addressed IV phlebitis by citing studies by Falchuk, Friedland, and Rusho. I stated that "according to Friedland, filters may well have an important role in selected patient groups." My entire article addressed the use of IV filters in specific patient groups! I bring to Gurevich's attention a paper by Quercia (*Am J Med* 1986; 80:364-368) in which a double-blind study was described. The study included patients admitted to a surgical intensive care unit; patients were randomly assigned a final filterset containing either a 0.22 micron bacterial retention filter (IVEX®-2) or an identical in-line cartridge without a filter. The study concluded that "(1) a significant level of extrinsic contamination of intravenous infusion deliv-