



# e-Network Forum

## CALIFORNIA BLOOD BANK SOCIETY

"We help save lives of people who need blood"

Search CBBS Website

### ***Transfusion practices during and after reinfusion of blood salvaged during surgery***

**A California blood banker** reports that salvaged red cells collected from patients undergoing surgery in their hospital are collected in bags and then re-infused through an appropriate filter but without washing the collected blood. The blood is usually collected from trauma patients, abdominal aortic aneurysm patients, or those undergoing back surgery. In addition to the blood salvage scheme outlined above, their current practice is to ALSO transfuse 3 units of FFP and 1 unit of plateletpheresis for every 4 units of salvaged blood that are reinfused. The inquiring blood banker is wondering if the described "cookbook" approach is justified according to any published evidence or expert experience.

In response to the above, the following replies were submitted. Clearly, this is a contentious topic, and the e-Network Forum Editor & Moderator has attempted to keep the discussion collegial.

1. **One blood banker** suggested that the e-Network read the information about ultrasound to filter fat from blood just published at [Nature \(Science Update\)](#).
2. **An anesthesiologist in San Francisco** commented that, in his opinion, the use of non-washed salvaged "blood" from surgical wounds has been addressed, in part, in the review by Stowell DP, Giordano GF, Renner SW, Thurer RL, and Weiskopf RB - An annotated bibliography on autologous transfusion second edition. Transfusion 88:400-409, 1998. According to the anesthesiologist, many experienced clinicians would be of the opinion that the amount of non-washed material being infused at the inquiring institution is greater than recommended. He continues by suggesting that **washed** salvaged material is preferred. In addition, as far as he is aware, there is **no support for the formula described**. All practice parameters/ guidelines of which he is aware (e.g. American Society of Anesthesiologists Task Force on Blood Component Therapy Practice guidelines for blood component therapy. Anesthesiology 84:732-747, 1996 and the CAP publication) state specific well-known criteria for the administration of FFP or platelets and advise against any specific formula. Furthermore, the anesthesiologist believes that one would not expect a coagulopathy based on dilution of coagulation factors or platelets until much greater blood loss and transfusion than is represented by 4 units (in a normal sized adult), even though such collected material is generally defibrinated.
3. **A transfusion medicine physician in Chicago** says that to his knowledge there is **no published evidence to support the approach used** at the inquiring blood banker's institution. To quote "If compelling data existed, it would be the standard of care. Most published guidelines, in fact, recommend avoiding use of such cookbook approaches. With regard to not washing salvaged blood, there are data and published experience to indicate that not washing salvaged blood is problematic. These RBC's contain anticoagulant (usually heparin) and other naturally occurring degradation products of in situ clotting, such as activated plasminogen, fibrin degradation products, etc., other middle molecules that may be either anticoagulant or prothrombotic in nature." He adds that he does not know of reports analyzing the supernatant materials of un-washed salvaged RBC specifically for D-dimers, but he would bet that they contain D-dimers, too.

The Chicago physician offers the following **summary** (edited) of his opinions:

- Published guidelines warn against such approaches because doing so is based on little or no evidentiary validity.
- From a blood conservation approach, the reported practice is not indicated (i.e., risks and costs outweigh benefits) and a waste of blood.
- At the Chicago physician's institution they salvage (and wash) 25-40 cases per month (typically the heavy bleeders, such as re-do orthopedic joint surgeries, scoliosis surgeries, triple-A's and CABG-valve replacements, chiefly). In the last 12 years of their experience, they have never provided such replacement on a cookbook basis. And although they haven't studied it scientifically, they are not in the midst of an on-going and progressive deluge of post-operative coagulopathy cases either.
- Such institutionally invented approaches set a false standard of care.

4. **The Director of an Intraoperative Autotransfusion Service in Ohio** believes that the transfusion of platelets and plasma at the inquiring blood banker's institution is **compensating for the DIC which is being caused by the readministration of unwashed product**. In the responding individual's opinion, unwashed cell salvage should be used in very, very limited quantities, if at all. In Ohio, they perform transfusion of post-operative unwashed cell salvage with devices such as the Gish and Stryker drains because they generally only retransfuse a few hundred mls. The respondent believes that the human body has the ability to compensate for limited amounts of such material being readministered. Even with these devices where minimal quantities of readministered blood are given, there have been reports of DIC occurring.

Please submit comments to the [e-Network Forum](#).

Ira A. Shulman, MD  
CBBS e-Network Forum Editor & Moderator



**Printable PDF of this page**

**Posted:** October 10, 2002

**Addenda:**

**Link Updated:** May 26, 2005

The e-Network Forum is supported by the California Blood Bank Society (CBBS) and endorses collegial discussion among blood banking and transfusion medicine professionals. However, the CBBS does not necessarily endorse the specific views and opinions expressed in the forum. The forum is not intended as a substitute for medical or legal advice and the content should not be relied upon for any medical or legal purposes. Readers should make their own determinations as to: (i) what constitutes appropriate medical, technical, and administrative practices, and (ii) how best to comply with laws and regulations relevant to their questions. For the latter, they should consider consulting, as to any medical matters, a qualified physician, and, as to any legal matters, an attorney familiar with related state and federal laws. The user of the forum, by accessing same, assumes all risks arising out of such use and releases CBBS and their respective members, directors, officers and agents from and against any loss, damage, claim or liability arising out of such use of the forum.