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- Fast Breaking News →
- Contacts →
- CBBS Meetings →
- Education Fund
- Corporate Support →
- Jobs & Sale Listings →
- Useful Links →
- Site Help/Info →
- Member Area Login

HOME

Using a microwave to thaw FFP

A transfusion service has been requested to consider using a microwave to thaw FFP. Is any facility currently thawing FFP using such a device, and if so, which one, what has been the performance of the device, and how do you assure the device does not cause uneven heating or damage to the plasma product?

The following replies were submitted in response to the above:

1. **A blood banker in California** reports that since 1993, her hospital transfusion service has been using a microwave oven to thaw FFP. She adds that replacement parts and newer models of the microwave oven are supplied by **ARK Bio-Medical Canada Corp.** In her transfusion service's hands, the device performance has been excellent with very short thawing times (1 unit of FFP is thawed in approximately 7-8 minutes, and 2 to 3 units are thawed in less than 15 minutes). It enables rapid deployment of FFP in emergency situations, and the microwave oven automatically shuts itself off when the thawed blood product reaches 24C. QC is performed daily by thawing a frozen expired plasma and then immediately taking its temperature. The average recorded temperature of the thawed unit is between 20 and 21.5C. The responding blood banker reports that her transfusion service was told by an AABB inspector that coagulation studies were not required by the hospital transfusion service in as much as the microwave oven manufacturer had fulfilled that requirement. The responding blood banker adds that there are 2 potential disadvantages to using their current microwave oven: (i) the donor center must provide plasma with the portals flat, and (ii) their model does NOT allow the thawed FFP to be confined within a protective plastic bag. Their current microwave oven will be retired and be replaced with an updated model later this year. The new unit (model 72A ARK Microwave) will have 2 bag holders instead of 3. It also will have a dropped bottom to accommodate spills (which she says will be a nice feature).
2. **A blood banker from the Midwest** provided the following two **references** to studies that were done to investigate microwaved plasma. Sherman, L. A. and Dorner, I. M.: A rapid method for thawing fresh frozen plasma. *Transfusion* 14:595-597, 1974. Sherman, L. A., Thompson, K., O'Kell, R. T., Albro, P., and Inkster, M.: Phthalate levels in microwave-thawed fresh frozen plasma. *Transfusion*. 5,22:401, 1982. In the first paper, the feasibility to microwave frozen plasma was evaluated, as was the stability of the coagulation factors during the thawing process. The second paper was done in collaboration with another research group and answered FDA concerns about increased plasma phthalate levels resulting from the microwaving, as compared to standard thawing. Microwaving the frozen plasma did not cause phthalate release. The Midwest blood banker also adds that rotation and/or movement of the bag is important to avoid overheating. The latter becomes apparent when white particles appear, which are probably fibrinogen which precipitates at 56 degrees C. There have been microwaves marketed in the past few years, which keep the bag moving to avoid uneven heat distribution.
3. **A blood bank physician in Texas** wrote that the only microwave device that should be used to thaw FFP is one that has been approved by the FDA for such use or one that has been validated for this use by the facility using it. Do not put FFP in your lunchroom microwave!
4. **A blood banker in Michigan** reports that his hospital stopped using the microwave because too many bags broke along the fold lines. He believes that using the microwave is "a neat idea, however". He concludes that newer models may simply need some advanced programming of the emitter to thaw so that the bag softens with or slightly ahead of the contents.

ADDENDA Sept. 21, 2007

5. **A blood bank lead technologist at a medical center located in Georgia** reports that they use a microwave oven to thaw FFP. They want to **replace their existing (but very old) microwave with a new device**. Their current microwave was purchased over 13 years ago, and they want to know **which companies are currently distributing microwave ovens that are FDA approved for thawing FFP**.



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

[Ira A. Shulman, MD](#)

CBBS e-Network Forum Editor & Moderator

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