

LETTERS TO THE EDITOR

THE EFFECT OF CYCLOSPORINE CONCENTRATION ON THE LABELING EFFICIENCY OF AN IN VITRO TECHNETIUM-99M RED BLOOD CELL LABELING PROCEDURE

To the Editor: While reviewing the recent literature on labeling of red cells with ^{99m}Tc , we noted an interesting article by Garringer (1). The article tests the effects of various levels of cyclosporine on the labeling efficiency of an in-house in vitro RBC labeling kit using ^{99m}Tc and compares the results with those obtained by Allen et al. (2) in an earlier article. Both authors used in vitro kits that contained 2 μg stannous ion (Sn^{+2}), with the major difference between the kits being that one was a commercially available kit and the other an in-house product. The article by Garringer claims to refute the results of Allen et al.'s paper by saying that there was no interference whatsoever from cyclosporine on the ability of his kit to label RBCs with ^{99m}Tc .

Close examination of Garringer's results reveal that they only confirm what was already published in Allen et al.'s article. In their article, Allen et al. state that they tested levels of cyclosporine concentrations from 500 ng/ml of whole blood up to levels of 2000 ng/ml in 500-ng increments and found no interference in labeling percentages up to 1000 ng/ml concentrations. The decline in labeling efficiency only occurred in the 1500- and 2000-ng/ml concentrations according to Allen et al. Since Garringer did not test his kit for concentrations above 1000 ng/ml, we do not know if higher levels of cyclosporine have an adverse effect on his kit. The reader can only conclude that the results of Garringer's article confirm the already published results by Allen et al.

There were two other interesting results outlined in the article by Garringer et al. First, even though he obtained labeling efficiencies above 90%, he did not obtain the 97% labeling he expected. Second, he states that when the amount of Sn^{+2} ion was increased to levels as high as 45 μg , the labeling efficiency actually became worse (as low as 75%–80%). Both of these results are probably re-

lated to the use of EDTA to remove extracellular Sn^{+2} ion. It is most likely that the EDTA is not removing all of the Sn^{+2} ion from the extracellular space. Residual amounts of the Sn^{+2} ion could cause some of the $^{99m}\text{TcO}_4^-$ ion to label to proteins that are present in the plasma. Since the labeled proteins would be associated with the liquid portion (supernate) when centrifugation occurs, it would have a net result of decreased labeling efficiency.

The use of the commercially available UltraTag® RBC kit solves the problems stated by both Garringer and Allen et al. The results reported by Gleue et al. (3) confirm that high levels of cyclosporine do not interfere with obtaining high labeling efficiencies when the UltraTag® RBC kit is used to label RBCs with ^{99m}Tc . The use of sodium hypochlorite in the UltraTag® RBC kit will eliminate all extracellular Sn^{+2} ion, thus increasing the labeling efficiency to levels above 95%.

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NMTCB DIRECTIONS

To the Editor: I am responding to the JNMT informational report and would like to share my views. First, I am the business manager for a multisite radiology department and am directly responsible for over 200 employees. My background is as a nuclear medicine technologist. I am strongly in favor of the NMTCB taking a more proactive approach to the changes in health care.

I do not believe the NMTCB has done so in the past. The implementation of specialty exams is very important. Many nuclear medicine technologists have been moving along in their careers and the NMTCB has not been moving with them. Implementation of next-order exams is crucial. I agree with your choices: advanced radiation safety, advanced instrumentation, advanced computer applications, advanced quality resources are my suggestions for names of exams, although some of these may be combined.

One final point: I feel that the NMTCB needs to develop a recertification exam to be taken, for example, every five years by technologists to show continued competency. If you are going to choose not to require CE (which may or may not be a mistake), then you must take a proactive approach to help NMTs and health care providers prove continued competency as best as you can.

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Reply: Thank you very much for your input and for sharing your ideas. It might surprise you to know that in the 5+ years that I have been with the NMTCB, yours are the first specific suggestions I have received from a CNMT as to the future direction the Board should take. Your ideas are very welcome and timely, and I'd like to share with you the Board's thinking on some of your suggestions.

I am pleased to tell you that the Board is already pursuing some of your ideas. In fact, the adoption of a computer-based exam delivery system is a preparatory step to position the NMTCB to do some of the things you mentioned. Periodic recertification is one of the issues the Board has explored and discussed at length as a means of ensuring continuing competency of CNMTs. While the Board has publically endorsed and recommended ongoing continuing education for CNMTs, some in the profession think CE is a very loose measure of continuing competency since it does not provide a standard, uniform criteria against which a technologist's competency is evaluated. Consequently, accumulating some minimum number of

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CEUs is no assurance or demonstration of professional competency. Recertification, on the other hand, does measure against a specific criterion and is one that can be determined with specificity based on appropriate input from the profession. That input in determining valid competency criteria is essential in a changing health care environment.

Some continuing education is excellent, such as the SNM VOICE-approved programs. Some "so-called" continuing education is a meaningless farce, as there is no quality control on many activities passed off as continuing education. Frankly, I question whether a mandatory continuing education system that only spot checks a small percentage of members for compliance is any more effective than the NMTCB's policy of advocating professional responsibility and voluntary continuing education as one means of maintaining competency. Technologists who do not see a need to maintain their competency will either ignore the mandatory CE requirement or find a way to beat the system, especially when no real sanctions are applied to violators. Recertification, on the other hand, does not have these shortcomings and does a demonstrably better job of measuring and ensuring continuing competency in the changing health care environment you describe. That may be why some in the profession do not favor the periodic recertification you are advocating.

The Board has looked at the resources required to implement periodic recertification as one example of looking to the future. In addition to the several hundred new technologist entering the field every year to be tested (1408 tested in 1995), recertification every fifth year of the present 17,000+ CNMTs would require an additional 3400 test administrations annually, not counting any retesting that might be necessary for unsuccessful examinees. Testing at that level of activity can much more readily be accomplished in the new computer-based year-round test delivery system and will be much more feasible in terms of examinee convenience when the additional 200 com-

puter testing sites are finally on line. Augmentation of examinee processing capacity would also be required, with implications for staffing and communication efficiencies.

Similarly, a variety of special competency examinations (such as nuclear cardiology and the others you mention) can be developed, maintained and delivered through a nationwide delivery system of computer-based testing facilities—provided there is an adequate exam item base of test materials developed by the profession. That is why the NMTCB has been making an even more concerted effort to expand the test item bank by transitioning to year-round item writing (rather than the previous annual cycle), soliciting more item writers and providing item writer training at the Society of Nuclear Medicine annual meetings and at SNM-TS chapter meetings. Professionally responsible and concerned CNMTs like yourself can participate in the solution by volunteering to write test items that you believe are representative of the level of competency necessary to ensure quality patient care and the continued viability of nuclear medicine technology as necessary to enhance its status within the medical community and with the public as a valuable component of a modern health care delivery system.

The Board is currently preparing additional Item Writer development materials and information in printed and electronic form for interested CNMTs who may be unable to attend national or regional meetings for in-person training as an item writer. In addition, the Board is requesting that CNMTs who may feel ill-prepared to actually write items due to time constraints or other reasons look for and send in good clinical images on which to base exam questions to be written by other experienced CNMT item writers. One of the benefits of computer testing is the ability to incorporate real-life clinical images into the competency evaluation in the same manner a technologist would experience them in professional practice.

In my opinion, the best way, if not the only way, to ensure the continuing

competency and appropriate recognition of nuclear medicine technologists is for CNMTs to join with the NMTCB as the catalyst, with the support of the SNM-TS, to police ourselves through voluntary recertification. The NMTCB has always offered this service to CNMTs and will be promoting it more actively as additional testing centers come on line. It is important to understand that the NMTCB will be prepared to offer advanced competency, specialized exams and is already prepared to offer recertification, but it is the CNMTs themselves who have to agree to recertification.

As a preliminary step in this direction, the Board has already developed, and has available at nominal cost, a computer-based Mock Certification Exam for self-evaluation of current competency. These Mock Exam disks contain representative certification type questions and include an explanation of correct and incorrect responses to the various test items. This software will be updated periodically and will reflect current practice based on the latest Task Analysis. To this end, a new Task Analysis Survey form is currently in development. The Board is hopeful that the Mock Exam disks will not only serve to prepare future and current CNMTs for a computer testing experience (new to all) but will serve as a means of relieving understandable test taking anxiety by long time technologists who may feel somewhat vulnerable.

I am glad that you think the profession is ready for recertification and advanced competency certification. I join you in that belief and hope that the feeling is universal, but time will tell. If we are correct, then the principle on which those far-sighted members of the SNM-TS founded the NMTCB almost 20 years ago—certification of nuclear medicine technologists by nuclear medicine technologists—will be a reality.

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