ARSAC Evaluation of Half-activity Myocardial Perfusion Imaging using Resolution Recovery Software

Invitation to participate in the audit

On behalf of the Department of Health Administration of Radioactive Substances Advisory Committee (ARSAC), the Institute of Physics and Engineering in Medicine Nuclear Medicine Software Quality Group (NMSQG) has been asked to evaluate the use of manufacturers’ Resolution Recovery (RR) software for processing myocardial perfusion studies obtained with half the standard counts. ARSAC would like us to test this software in a variety of routine clinical situations to see whether it could replace the standard method. The objective of this study is to see whether images obtained with half the normal administrated activity and processed with RR Software can give the same clinical interpretation as that obtained with normal activity and processed in the standard way.

A copy of the project protocol is enclosed, so that you can see full details of what is involved.

We are now inviting nuclear medicine departments in the UK that perform significant numbers of myocardial perfusion studies to participate in this audit. Departments need not already have RR software available on their computers, because several manufacturers have agreed to assist their users by giving access to this software for a trial period, so this is a good opportunity to try it out. Participating departments will be asked to evaluate in total 50 routine technetium myocardial perfusion SPECT studies (50 stress and 50 rest scans) from their own patients. These should be existing studies which have already been reported by their clinician in the normal way. These 100 scans will then be anonymised and sent to the NMSQG who will pass them through a software program that generates a simulated half-count scan from each original. These simulated half-count studies will then be returned to the participating department who will reconstruct them with appropriate resolution recovery software. These scans will then be re-reported blindly by the same clinician who reported the original scan. This report will be compared with the original report using a simple scoring system. If this part of the study shows very few differences in the reports then the clinician will also be asked to report the 50 half-count studies reconstructed without RR.

If you participate in this audit and find that there are a large number of clinically significant discrepancies in the reports between full count data reconstructed in the standard way and half-count data reconstructed with RR, then you may conclude that it is not appropriate to reduce your administered activity, even with the use of RR software. However, if there are very few discrepancies in the reports between full count data reconstructed in the standard way and half-count data reconstructed with RR, then you will know that you could consider reducing administered activity and using RR software without affecting your clinical results. In this case it would be advisable to also re-report the half-count data reconstructed without RR, in order to see whether it would be possible to reduce administered activity but stick with standard processing. Therefore participating in this study would be a good opportunity to help decide whether it is possible for your department to reduce administered activity (or reduce scanning time), and if so whether it is necessary to invest in resolution recovery software to achieve this. These results would be directly relevant to your own administered activity, your own scanning protocol and your reconstruction software and can be obtained without having to re-scan any patients.

If the myocardial SPECT has been acquired with ECG gating then quantitative parameters of myocardial function (EDV, ESV and LVEF) will also be compared.
Compared with most NMSQG audits there is quite a lot of work involved in taking part in this study. We therefore ask you take into account the following factors:

- You should have sufficient available resources in terms of staff and time. A local coordinator from your department should be assigned to this study.
- Co-operation of the clinician who normally reports your myocardial perfusion scans is critical as they will have to re-report 50 studies and possibly produce another report on the same 50 as well.
- In order to demonstrate that you have sufficient experience in myocardial perfusion scanning it is suggested that you should normally be doing at least 10 myocardial perfusion patients per week (10 stress and 10 rest scans). These should be performed using either $^{99m}$Tc tetrofosmin or $^{99m}$Tc sestamibi as $^{201}$Tl is not included in this study
- Your nuclear medicine computer system must be suitable for running the manufacturers resolution recovery software. Your manufacturer will be able to advise on this. Contact details are given in the full protocol.

If you are able to complete this study the results will hopefully inform you as to whether or not it would be feasible to reduce your normal administered activity and make use of RR software to obtain equivalent results in your own department. This would have the benefit of saving you money by reducing $^{99m}$Tc usage and at the same time reduce patient doses. The NMSQG will compile results from all participating centres and information on the overall evaluation of RR software will be shared with participants, but individual results will be treated in confidence. A report will also be sent to ARSAC which will enable them to consider whether it is feasible to reduce diagnostic reference levels in cases where resolution recovery software is available.

If you are willing to participate in this audit please read the full project protocol, complete the attached application form and return it to Duncan White at the address below. Please also let your regional audit coordinator know by letting them have a copy of the form. If you are not sure who your regional coordinator is you can find a list on the NMSQG web site (http://nmsqg.org). Once you have registered your interest in participating you will be sent full instructions. This will include information on how to contact your computer software manufacturer to request access to their software. If your system is not suitable or there is high demand, manufacturers may not be able to satisfy requests from all interested users, so it is important that you discuss this with your manufacturer and let the NMSQG know whether you are able to continue.

If you have any problems or queries regarding this project, please contact either of the NMSQG audit organisers (see below)

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