Quality Assurance of Analysis of DMSA Imaging

The Data

This data set contains the DMSA scans from ten patients. Each patient has two views of the kidney, anterior and posterior in a 128x128 matrix. The data is presented in interfile version 3.3 format.

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Anterior filename</th>
<th>Posterior filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>p1ant</td>
<td>p1post</td>
</tr>
<tr>
<td>2</td>
<td>p2ant</td>
<td>P2post</td>
</tr>
<tr>
<td>3</td>
<td>p3ant</td>
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</tr>
<tr>
<td>4</td>
<td>p4ant</td>
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<td>p5ant</td>
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<td>6</td>
<td>p6ant</td>
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<tr>
<td>7</td>
<td>p7ant</td>
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<td>8</td>
<td>p8ant</td>
<td>p8post</td>
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<tr>
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<td>p9post</td>
</tr>
<tr>
<td>10</td>
<td>p10ant</td>
<td>p10post</td>
</tr>
</tbody>
</table>

Each interfile image is stored in two files, one containing the header (.hdr) and one containing the image data (.img).

For example, patient 1 has four files containing the data for the two views:

- p1ant.hdr   header file for anterior
- p1ant.img   image data for anterior
- p1post.hdr   header file for posterior
- p1post.img   image data for posterior

The patient age can be determined from the header file.

Reading the Data

The data should be converted from Interfile format to that of your own computer system. Most systems should have this facility. If in doubt, ask the manufacturer of your system who should be able to show you how to transfer the data. As DICOM is fast becoming the principal medium for medical image data transfer, the audit data will be made available in this form in the near future.

To test that the process of reading the files has worked correctly, the images of patient 1 should appear as in the figure below. The total count in the anterior image should be 68757 and the total in the posterior image 87847.
Analysis of the Data

The data enables evaluation of software for assessing the relative renal function from DMSA images. The main purpose is to allow centres to test the analysis system they use routinely. Therefore if your current process only uses the posterior image data then the anterior image should be ignored. The data should also be useful for comparing the performance of different systems particularly when changing from one system to another.

Evaluation of the Data

The results of the UK analysis of this data have been published in Nuclear Medicine Communications. The reference is:


This gives the distribution of values from centres in the UK for each of the ten sets of data. Although the correct results of these studies are not known, it is assumed for the present that the UK national mean is a reasonable estimate of truth. Therefore your results should be as close to this value as possible and certainly within the 10-90 percentile interval for each study.

If you have any questions about this audit please contact the audit organiser

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INSTITUTE OF PHYSICS AND ENGINEERING IN MEDICINE

Nuclear Medicine Software Working Party

Quality Assurance of Analysis of DMSA Imaging

APPLICATION FORM (Please use one form per computer system)

Name of Site:

Name and address of person co-ordinating participation for site:

Tel: Fax: email:

Regional Audit Coordinator:

Computer system manufacturer:

Make and model:

Version of software:

Name and version of DMSA analysis programme:

Suggested medium for receiving data from manufacturer (please tick appropriate box):

Tape [ ] Please specify:

Optical disc [ ] Please specify:

3½” floppy [ ] Internet [ ]

Modem [ ] Don’t know [ ]

Please return completed form to your manufacturer with a copy to your regional coordinator
Name of Site:  
Operator Identifier (e.g. 1,2, etc):

**Computer System**

Manufacturer:  
Make and Model of computer:

Name and version of DMSA software:

**Details of analysis (Please tick appropriate box in each case)**

Software used:
- Commercial  
- User written programme 
- User written protocol 
- Don't know

Images used for calculation of relative function:
- Posterior only  
- Geometric mean 

ROI:  Please briefly describe method and **enclose a copy of the results presented to the radiologist/nuclear medicine consultant for reporting**

Is background subtraction used:  Yes / No (Delete as applicable)

**Operator experience (Please tick appropriate box in each case)**

How long have you been routinely processing DMSA scans ?
- < 6 months  
- 6 months - 1 year  
- > 1 year 

How many DMSA scans do you process per month ?
- 1-10  
- 11-30  
- >30

**DMSA Analysis Result Form contd**
If the images have been transferred correctly they should be in the conventional orientation as shown below:

![Orientation Diagram](image)

Please return this form to your Regional Audit Coordinator

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Percentage of Total Renal Function for Right Kidney</th>
<th>Comment on Analysis (if necessary)</th>
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</thead>
<tbody>
<tr>
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