

**For personal use only. Not to be reproduced without permission of the editor (permissions@pharmj.org.uk)**

# Radiopharmacy

This issue's special feature, on which these questions are based, was commissioned from independent authors. The Life-long Learning scheme is supported by an educational grant from Mayne Pharma but the company has no editorial input. The scheme is open to all pharmacists. The information in the box below (right) should help readers to identify knowledge gaps and undertake continuing professional development. Readers are also invited to complete the questions overleaf on radiopharmacy, to test their knowledge of the articles, and send their answers, together with a stamped and addressed A5 envelope, to:

**Life-long Learning — Radiopharmacy  
Hospital Pharmacist  
1 Lambeth High Street  
London SE1 7JN**

Entries must be received by Monday, 24 October. Results will be returned with a certificate of completion.

Mayne Pharma is offering a place as part of its delegation to the European Association of Hospital Pharmacists conference in spring 2007 to the entrant who achieves the highest marks overall in this series of exercises. The best eight scores from the 10 exercises in the series (September 2005–July/August 2006) will



be taken into consideration. This is the first set of questions.

The runner-up will receive registration and expenses for the *Hospital Pharmacist* conference in autumn 2006. Third and fourth place, respectively, will receive Pharmaceutical Press vouchers and British Society for the History of Pharmacy china mugs. Further details on this scheme can be found in *Hospital Pharmacist* (2004;11:436) and at [www.pjonline.com/noticeboard/lifelong](http://www.pjonline.com/noticeboard/lifelong).

Your name, address and scores will be held on a database for the purpose of awarding prizes. Should you wish your details not to be held in this way, please tick the box. If you do this, you will be sent a certificate, but you will be ineligible for a prize.

Name \_\_\_\_\_

College member: Yes  No

RPSGB registration number: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Post code: \_\_\_\_\_

## Continuing education

This article is accredited as suitable for continuing education (CE) by the College of Pharmacy Practice. Completion of the questions will count towards the CE requirements of College members. Should you wish us to pass your scores to the College for this purpose, please tick the box (top right) showing that you are a College member.

Completion of the questions entitles undergraduates to one point towards the Professional Development Certificate, a joint initiative between the British Pharmaceutical Students' Association and the College.



## Continuing professional development

### Identify knowledge gaps

- ◆ To understand how radiopharmaceuticals are used in the diagnosis and treatment of disease
- ◆ To appreciate the various ways in which radiopharmaceuticals have the potential to cause harm

### Act

- ◆ Read the articles in this issue
- ◆ Test your knowledge by answering the multiple-choice questions overleaf

### Evaluate

- ◆ What have you learnt?
- ◆ How has it added value to your practice?

- ◆ What will you do now and how will this be achieved?

The Royal Pharmaceutical Society's areas of competence for pharmacists are listed in "Plan and record", (available at [www.rpsgb.org/education](http://www.rpsgb.org/education)).

The assistance of the College of Pharmacy Practice is acknowledged in producing the CPD elements of this month's special feature. Further information on how hospital pharmacists are approaching the challenges of CPD can be found in articles in the February issue of *Hospital Pharmacist* (2005;12:65–72).



To answer the questions, tick either the True or False column

	True	False		True	False
<b>1. Technetium-99m (<sup>99m</sup>Tc) sestamibi can be used for imaging:</b>			<b>6. For a therapeutic radiopharmaceutical, a good radioisotope:</b>		
a) The heart			a) Has gamma emissions and a short half-life		
b) The kidneys			b) Is yttrium-90 ( <sup>90</sup> Y)		
c) The parathyroid			c) Is <sup>99m</sup> Tc		
d) Lung cancer			d) Has an abundance of non-penetrating radiations		
e) Bone metastases			e) Can form complexes with or be incorporated into biological molecules		
<b>2. National guidance on the use of radiopharmaceuticals includes:</b>			<b>7. The following radiopharmaceuticals are used in the treatment of non-Hodgkin's lymphoma:</b>		
a) A National Institute for Health and Clinical Excellence (NICE) guideline that 2- <sup>18</sup> F-2-deoxy-D-glucose ( <sup>18</sup> FDG) positron emission tomography (PET) scanning be performed to investigate solitary pulmonary nodules			a) Indium-111 octreoscan		
b) A NICE guideline that, in the diagnosis and management of coronary artery disease, myocardial perfusion scintigraphy with positron emission tomography be used			b) <sup>90</sup> Y ibritumomab tiuxetan		
c) Dosing advice from the Administration of Radioactive Substances Advisory Committee			c) Iodine-131 ( <sup>131</sup> I) tositumomab		
d) A NICE guideline that every cancer network should have a system of rapid access to <sup>18</sup> FDG-PET scanning			d) <sup>131</sup> I sodium iodide		
e) A NICE guideline that recommends single photon emission computed tomography in patients in whom stress electrocardiography poses a particular problem			e) <sup>89</sup> Sr -chloride		
<b>3. Non-imaging radiopharmaceutical studies include:</b>			<b>8. Recognised adverse effects of radiopharmaceuticals include:</b>		
a) Multiple gated acquisition cardiac study			a) Local allergic reactions for <sup>99m</sup> Tc parabutyl iminodiacetic acid (BIDA)		
b) Oesophageal transit times			b) Dyspepsia for <sup>99m</sup> Tc methoxy-isobutyl isonitrile (MIBI)		
c) Bile acid breath test			c) Pruritus for <sup>99m</sup> Tc human immunoglobulin (HIG)		
d) Parathyroid scan			d) Dizziness for Iodine-125 ( <sup>125</sup> I) human serum albumin (HSA)		
e) Glomerular filtration rate study			e) Transient metallic taste for <sup>99m</sup> Tc tetrofosmin		
<b>4. In the imaging of the liver and kidney:</b>			<b>9. Potential drug/radiopharmaceutical interactions and effects include:</b>		
a) Radiopharmaceutical liver imaging is becoming more common			a) Levodopa binds to the dopamine transporter affecting studies with Iodine-123 ioflupane (DaTSCAN)		
b) The biliary system is investigated using gallium-67 citrate			b) Atropine increases gall bladder emptying in <sup>99m</sup> Tc BIDA studies		
c) Renal excretion is best determined by <sup>99m</sup> Tc hexamethylpropylene amine oxime (HMPAO)			c) Metoclopramide can affect the distribution of <sup>67</sup> Ga (gallium citrate)		
d) Renal parenchymal function is best determined by <sup>99m</sup> Tc dimercaptosuccinic acid (DMSA) renal study			d) Labetalol reduces the uptake of <sup>125</sup> I HSA		
e) Glomerular filtration rate is best determined by a chromium-51 ( <sup>51</sup> Cr) ethylenediamine tetraacetic acid (EDTA) study			e) Bleomycin reduces the uptake of <sup>51</sup> Cr EDTA		
<b>5. For a diagnostic radiopharmaceutical, a good radioisotope:</b>			<b>10. In the treatment of patients using radiopharmaceuticals:</b>		
a) Has gamma emissions and a short half-life			a) The unit used to define the radioactivity of a radioisotope is the becquerel		
b) Can form complexes with or be incorporated into biological molecules			b) Acute effects of radiation occur after whole-body exposures of 100 milligray		
c) Is <sup>99m</sup> Tc			c) Diagnostic procedures with <sup>99m</sup> Tc pertechnetate result in a whole-body dose of 20 milligray		
d) Has an abundance of non-penetrating radiations			d) Therapeutic procedures with <sup>131</sup> I (sodium iodide) result in a whole-body dose of 142 milligray		
e) Is strontium-89 ( <sup>89</sup> Sr)			e) Alpha emitting isotopes are normally used		

