Licensed Indications
Rivastigmine is indicated for the symptomatic treatment of mild to moderately severe Alzheimer’s dementia. Oral formulations are also indicated for the symptomatic treatment of mild to moderately severe dementia in patients with idiopathic Parkinson’s disease.

Therapeutic Summary
According to NICE, rivastigmine is recommended as an option for managing mild to moderate Alzheimer’s disease. Rivastigmine is an acetylcholinesterase (AChE) inhibitor, which works by increasing the concentration of acetylcholine at sites of neurotransmission.

Medicines Initiation and Continuation
Treatment with rivastigmine must be initiated by specialists in the care of patients with dementia (that is, psychiatrists including those specialising in learning disability, neurologists, and physicians specialising in the care of older people) following a comprehensive assessment and diagnosis.

Patients should be discharged back into primary care and the prescribing responsibility transferred to primary care prescribers only when the patient’s condition is stable and maintenance doses of rivastigmine have been achieved, as per the local Nottinghamshire ‘Dementia in Primary care’ Guidelines and guidelines for Managing Behaviour and Psychological Problems in Patients with Diagnosed or Suspected Dementia.

Products Available
Generic 1.5mg capsule, 3mg capsule, 4.5mg capsule, 6mg capsule; 2mg/ml oral solution; generic 4.6mg / 24 hour, 9.5mg / 24 hour and 13.3mg / 24 hour strength patches. Use of patches is only recommended when oral preparations cannot be tolerated.

Dosages and Route of Administration

Capsule / Oral Solution
- Treatment should be initiated at 1.5mg twice a day, with morning and evening meals (to minimise cholinergic side effects). Swallow whole.
- If tolerated, after a minimum of 2 weeks of treatment, the dose may be increased to 3mg twice daily. Further dosage increases to 4.5mg and then 6mg twice daily are again dependent on tolerability of the current dose and maybe considered after a minimum of 2 weeks treatment at that dose level.
- Maintenance dose is 3mg to 6mg twice a day.
- The MAXIMUM daily dose is 6mg twice daily.
- No dose adjustment is necessary for patients with mild to moderate renal or hepatic impairment. Rivastigmine may be employed for patients with severe renal or hepatic impairment, but close monitoring is necessary – use has not been studied.
- If treatment is interrupted for more than three days, it should be re-initiated at 1.5mg twice daily and then re-titrated as above (this is to reduce the possibility of adverse reactions e.g. vomiting).
- The oral solution and the capsule preparations may be interchanged at equal doses.

Patch
- Treatment should be initiated at 4.6mg / 24 hours.
- If tolerated, after a minimum of four weeks, the dose may be increased to 9.5mg / 24 hour.
- The recommended maintenance dose is 9.5mg / 24 hour.
- If well tolerated, and only after a period of at least 6 months of treatment at 9.5mg / 24 hour, the specialist may consider increasing the dose to 13.3mg / 24 hour in patients who have demonstrated meaningful cognitive deterioration and/or functional decline whilst on the 9.5mg / 24 hour dose.
• Treatment should be temporarily interrupted if gastrointestinal adverse reactions are observed until these adverse reactions resolve. Transdermal patch treatment can be resumed at the same dose if treatment is not interrupted for more than three days. Otherwise treatment should be re-initiated with 4.6 mg /24 hour.

• Switches between the oral solution / capsules and the patches are as follows:
  - 3 mg/day oral rivastigmine can be switched to 4.6 mg / 24 hour transdermal patches
  - 6 mg/day oral rivastigmine can be switched to 4.6 mg / 24 hour transdermal patches
  - 9 mg/day oral rivastigmine can be switched to 9.5 mg / 24 hour transdermal patches – only if 9mg/day oral dose has been tolerated. Otherwise a switch to 4.6 mg / 24 hour transdermal patches is recommended
  - 12 mg/day oral rivastigmine can be switched to 9.5 mg / 24 hour transdermal patches.

After switching to 4.6 mg / 24 h transdermal patches, provided these are well tolerated after a minimum of four weeks of treatment, the dose of 4.6 mg / 24 h should be increased to 9.5 mg / 24 h, which is the recommended effective dose. It is recommended to apply the first transdermal patch on the day following the last oral dose.

• Transdermal patches should be applied once a day to clean, dry, hairless, intact healthy skin on the upper or lower back, upper arm or chest, in a place which will not be rubbed by tight clothing. It is not recommended to apply the transdermal patch to the thigh or to the abdomen due to decreased bioavailability of rivastigmine observed when the transdermal patch is applied to these areas of the body.

• In 2010 the MHRA highlighted the risk of errors with rivastigmine patches⁶. They advised that patients and caregivers should told to replace the patch with a new one after 24 hours and the previous days patch must be removed before application of a new patch to a different skin location (same location should be avoided for 14 days). The patch should not be cut into pieces. In the case of suspected overdose, all patches should be removed immediately and no further patch should be applied for the next 24 hours.

NB. Homecare workers employed by Nottinghamshire County Council (NCC) and independent providers commissioned by NCC to provide social care are not able to apply rivastigmine patches.

Duration of Treatment
Treatment should be continued only when it is considered to be having a worthwhile effect on cognitive, global, functional or behavioural symptoms¹ - see below.

Primary Care Prescribers may refer back to the Specialist Service if changes or progress are cause for concern, or to discontinue rivastigmine treatment⁴.

The prescriber would be required to discuss with the patient, carer and other professionals involved in the care of the patient before making the decision to stop treatment where there is no worthwhile effect. Gradual withdrawal over a 4 week period would be preferable to abrupt discontinuation¹.

Monitoring Requirements and Responsibilities
Baseline screening / investigations to exclude other causes of cognitive impairment will have been carried out by the GP before initial referral to the Specialist Service.

For patients with existing or suspected cardiac disease or bradycardia (including those with cardiac arrhythmias or valve problems, and patients with hypertension who are being treated with anti-hypertensives that have a rate-limiting affect e.g. beta-blockers), an ECG should be carried out by the GP, as part of the baseline investigations prior to referral. Other patients should be referred with the GP confirming the absence of these conditions.

No routine plasma monitoring is required during rivastigmine treatment.

The Primary Care Prescriber will carry out an annual patient review for all dementia patients⁴.

For those prescribed pharmacological treatment, this will include a medication review as well as cognitive, global, functional and behavioural assessments, as per NICE guidance³.

Contraindications
• Known hypersensitivity to any ingredient.

Precautions
• Cardiovascular conditions: rivastigmine may have vagotonic effects on heart rate e.g. bradycardia. The potential for this action may be particularly important to patients with “sick sinus syndrome” or other supraventricular cardiac conduction conditions, such as sinatrial or atrioventricular block.
• Gastrointestinal conditions: rivastigmine may cause increased gastric acid secretions. Patients with a history of ulcer disease / active ulcer disease / those that are predisposed to these conditions, or receiving concurrent non-steroidal anti-inflammatory medication (NSAIDs) should be monitored for symptoms.
• Genitourinary: rivastigmine may induce or exacerbate urinary obstruction.

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Approved: November 2015
Review Date: November 2018
Author: John Lawton
• Neurological conditions: rivastigmine has the potential to cause generalised convulsions, however seizure activity may also be manifestation of Alzheimer’s disease. Rivastigmine also has the potential to exacerbate or induce extrapyramidal symptoms.
• Pulmonary conditions: prescribe with care to patients with a history of asthma or obstructive pulmonary disease due to cholinomimetic actions.

Explicit Criteria for Review and Discontinuation of the Medicine

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<th>ADVERSE EFFECT</th>
<th>ACTION</th>
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| Nausea / diarrhoea / vomiting | • Advise patient to take with or after food.  
• If severe consider an antiemetic e.g. domperidone.  
• Ensure patient takes plenty of fluids.  
• If any symptoms are persistent & problematic consider a reduction in the dose to a previously well tolerated dose. |
| Weight decrease / decreased appetite / anorexia | • Monitor weight on a regular basis. |
| Dizziness | • Advise patient to take time to stand up.  
• May subside during continued therapy. |
| Application site skin reactions (e.g. erythema, pruritus, oedema, dermatitis, irritation – patch only) | • Allergic contact dermatitis should be suspected if application site reactions spread beyond the patch size and if symptoms do not significantly improve within 48 hours after patch removal. In these cases, stop treatment. |
| Abdominal pain / dyspepsia | • Ensure patient takes plenty of fluids.  
• Discuss with specialist.  
• If severe consider prescribing an antacid. |
| Headache | • Treat with a simple analgesic e.g. paracetamol. |
| Tremor | • Discuss with specialist. |
| Insomnia | • Should subside after one week.  
• Consider a dose reduction. |
| Confusion / agitation / anxiety | • Consider a dose reduction.  
• Discuss with specialist. |
| Hyperhidrosis | • Discuss with specialist. |
| Muscle cramps | • Consider a dose reduction. |
| Somnolence / fatigue / asthenia / malaise | • Consider a dose reduction. |

Uncommon - insomnia, depression, syncope, elevated liver function tests, falls.
Rare – seizures (discontinue unless taking anticonvulsants, discuss with specialist), angina pectoris, gastric and duodenal ulcers, rash.
Very rare – hallucinations, extrapyramidal symptoms, cardiac arrhythmias (e.g. bradycardia, atrio-ventricular block, atrial fibrillation and tachycardia), gastrointestinal haemorrhage, pancreatitis, urinary tract infections, hypertension.
Unknown – dehydration, aggression, restlessness, sick sinus syndrome, oesophageal rupture (associated with severe vomiting), hepatitis, pruritis, disseminated allergic dermatitis (oral, transdermal).

Clinically Relevant Medicine Interactions and Their Management
• May interfere with medications that have anticholinergic activity e.g. procyclidine, oxybutynin.
• Beta-blockers - synergistic effects, bradycardia.
• Medicines that have the potential to cause torsades de pointes – consider an ECG.
• Cholinergic agonists - synergistic effects.
• Succinylcholine and other muscle relaxants - synergistic effects.
• Rivastigmine has the potential to increase the risk for developing ulcers when co-prescribed with non-steroidal anti-inflammatory medication (NSAIDs).
**Information Given To Patient**

The patient / carer should be instructed how to safely remove and replace rivastigmine patches, to wash hands with soap and water after removing the patch and to avoid contact with the eyes after handling the patch.

All skin application site reactions should be reported to a healthcare professional.

If treatment (oral and transdermal) is interrupted for more than three days this should be reported to a healthcare professional before it is restarted.

Further written information sheets on rivastigmine can be accessed via the following site:
- [http://www.choiceandmedication.org/nottinghamshirehealthcare/](http://www.choiceandmedication.org/nottinghamshirehealthcare/)
- [www.alzheimers.org.uk/Facts_about_dementia/factsheets.htm](http://www.alzheimers.org.uk/Facts_about_dementia/factsheets.htm)

**Patient / Carer’s Role**

- The patient / carer will report any suspected adverse reactions to the GP for assessment.
- The patient / carer will report to their GP or specialist signs of clinical worsening.
- The patient / carer will attend all follow-up appointments with GP and specialist. If they are unable to attend any appointments they should inform the relevant practitioner as soon as possible and arrange an alternative appointment.

**References**


3. Exelon 4.6mg/24h, 9.5mg/24h, 13.3mg/24h transdermal patch. Novartis Pharmaceuticals UK Ltd on-line SPC (updated eMC 22.05.2015)

4. Dementia in Primary Care: Guidelines for Prevention, Early Identification and Management including Short Version. Revised July 2013, Local Nottinghamshire CCGs.

5. Nottinghamshire APC Managing Behaviour and Psychological Problems in Patients with Diagnosed or Suspected Dementia in Primary and Secondary care (September 2015).