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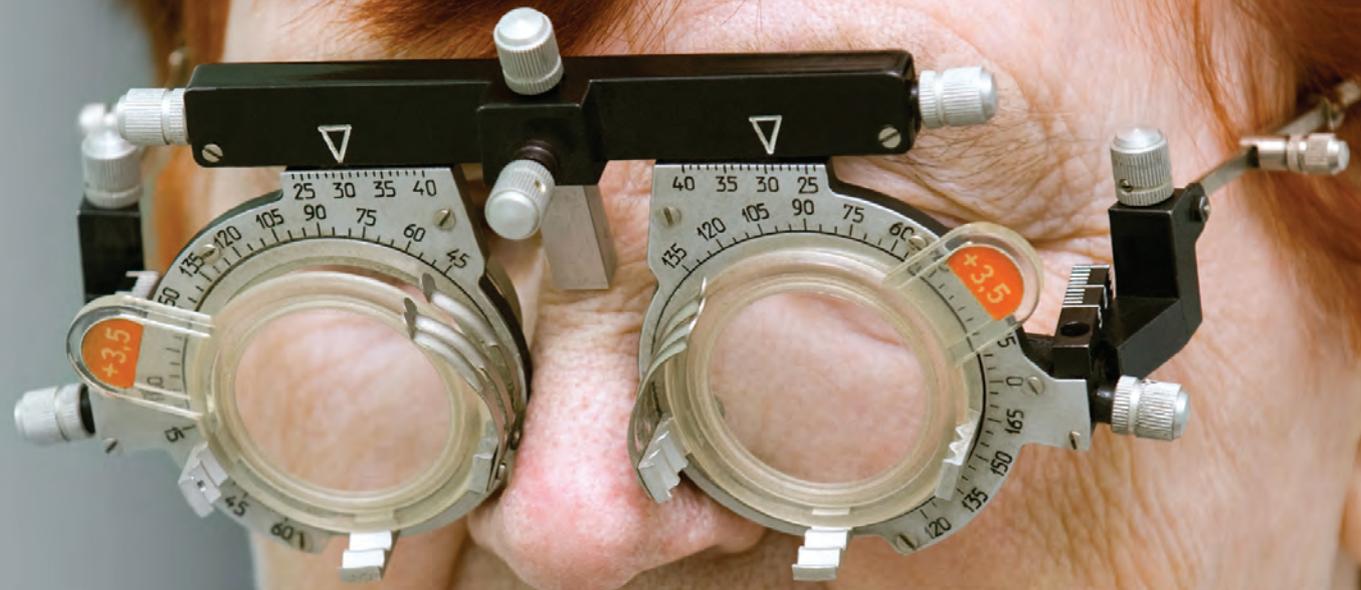
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Best Practice Statement September 2013

Screening, assessment and management of vision problems in the first 30 days after an acute stroke.



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1: A Best Practice Statement for Vision Problems after Stroke

1.1: Background

This Best Practice Statement (BPS) was proposed by the Scottish Vision and Stroke Network and funded by the National Advisory Committee for Stroke (NACS) in Scotland. It has been developed by the University of Glasgow, in collaboration with a multi-disciplinary team of clinicians, academics, voluntary organisations, and patient representatives from across Scotland. A list of all contributors is provided in Appendix 1.

1.2: Intended Readers

The statement is intended for all healthcare professionals involved in the care of adults who are in hospital following a diagnosis of stroke. The statement defines adults as people who are 16 years and older.

1.3: Purpose of the Best Practice Statement

The BPS for Vision Problems after Stroke provides guidance for the screening, assessment, treatment, and management of patients whilst they are in hospital during the acute phase of stroke. The contents of the document

are based on the best available evidence at the time of publication and on expert opinion. It is acknowledged that the extent to which particular interventions are appropriate, and can be implemented, will be dependent on each patient's physical and mental health status at the time of assessment.

The statement provides specific guidance on the following:

- Initial screening on presentation in hospital
- Visual field deficits
- Eye movement disorders
- Visual inattention/neglect

General guidance is provided in Statement 5.

1.4: Rationale for the development of the Best Practice Statement

Stroke is a '*life changing experience*' (Rosalind Jack, patient representative). In 2012, around 12,500 new cases of stroke were reported in Scotland (NHS ISD 2012).

Approximately 80% of patients who have a stroke survive the first 30 days (the Scottish Intercollegiate Guidelines Network [SIGN 118]). The resulting brain damage can

affect the visual system causing problems with visual perception, eye movement disorders, low vision and visual field loss (Rowe et al 2009), and imposes an additional burden on those who have co-existing disease or disability. Current evidence-based guidelines for stroke recommend that everyone who has a stroke should be screened for vision problems (SIGN 118, National Institute for Health and Care Excellence [NICE CG68, 2008, NICE CG162, 2013], Royal College of Physicians [RCP 2012]). However, there is no standardised approach to screening for vision problems when patients first present in hospital with a diagnosis of stroke, or for the management of stroke-related vision problems identified in the acute phase. Moreover, the best course of rehabilitation is not known, and support services are not clearly identified. This can adversely affect recovery and rehabilitation, and can negatively impact patients' quality of life and that of their family (Bambara et al 2009, Tistad et al 2012). The aim of this document is to address that gap by providing guidance for practice that is based on the evidence available from a wide range of resources and expert knowledge.

"Going from sighted to visually impaired, suddenly and without warning is traumatic"

Rosalind Jack, Patient Representative.

1.5: Methodology

The method used to produce this BPS was adapted from one previously developed by NHS Quality Improvement Scotland, now Health Improvement Scotland (NHS HIS). Key stages in the process are described fully in Section 3 (page 24) and outlined in Figure 2 (page 28).

1.6: Scope of the Statement

The BPS statement for vision problems after stroke provides current best practice guidance for the care of adults admitted to hospital following a suspected stroke. The guidance is focused on the first 30 days following acute stroke.

1.7: Format of the Statement

The document is divided into five statements:

1. Best Practice for Initial Screening of Vision Problems after Stroke;
2. Best Practice for Visual Field Deficits;
3. Best Practice for Eye Movement Disorders;
4. Best Practice for Visual Neglect/Inattention;
5. General Guidance.

A decision flow chart for the screening and assessment pathway for vision problems after stroke is provided in Figure 1 (page 23).

2: The Statements

The statements are presented on pages 4-22.

A summary of key points, the rationale for the statement, references on which the statement is based, and links to further information are included with each statement.

Suggestions for ways to demonstrate how the statement is being achieved, and key challenges for the implementation of the statement are provided.

Areas for further research are identified. Suggestions from patient representatives who continue to experience vision problems as a result of their stroke are embedded throughout the document.

Statement 1: Best Practice for Initial Screening of Vision Problems After Stroke

Key Points

1. Early detection of vision problems following a stroke is essential for rehabilitation.
2. Awareness of pre-existing vision problems is important in identifying the cause of visual loss.
3. All members of the multidisciplinary team have responsibility for identifying visual deficits.
4. All staff should have adequate training in order to recognise vision problems.

Statement	Rationale for Statement	What will demonstrate the Statement is being achieved?
Screening for visual function should be carried out as part of the initial general screen of patients following stroke.	A simple screening procedure can be successful in identifying patients with visual difficulties. Early detection of visual impairment is likely to impact on rehabilitation and functional outcome. The screening procedure should include eye movement disorders as these are often missed. ¹	Visual function screening will be documented in patients' notes. All members of the multi-disciplinary team will be aware of the vision problem.
The visual screening tool available from the STARs (Stroke Training and Awareness Resources) module may be used for initial screening.	No standardised screening exists. There is a tool (Screening for Visual Defects Following Stroke) available in STARs which is freely accessible and can be used at the bedside.	Visual function screening will be documented in patients' notes. All members of the multi-disciplinary team will be aware of the vision problem.

<p>Pre-existing vision problems (e.g. age-related macular degeneration, cataract) should be identified.</p> <p>Visual aids (including spectacles, contact lenses) should be used if appropriate, during screening.</p>	<p>Identifying any pre-existing vision problems ensures that optimum vision is tested and helps to ensure that the correct cause of vision loss is identified.</p>	<p>Pre-existing visual conditions will be documented in the case history. Where a visual aid is used this will be recorded in the patient notes.</p>
<p>If screening demonstrates that a patient has a new impairment of visual function they should be referred to Orthoptic Services for further assessment.</p>	<p>This will ensure that the vision problem is correctly identified and appropriate rehabilitation is put in place.</p>	<p>The referral will be documented in the patient notes. The number of referrals to Orthoptic services should be monitored.</p>
<p>References on which this statement is based</p> <p>The evidence base is poor. Recommendations are based on SIGN 118, and NICE 2012 CG162, Rowe 2008¹; Demaerschalk et al., 2012; Kitsos, <i>et al.</i> 2011; Cate & Richards, 2000; and expert opinion.</p>		
<p>Links and Further Information</p> <p>The STARs module screening tool is available at the following URL: http://labyrinth.mvm.ed.ac.uk/files/1384/Visual_Screen_for_Stroke.pdf</p> <p>To access the STARs module go to: www.stroketraining.org Click on 'Advancing Modules' then 'Start Advancing Modules' then 'Vision'.</p>		

Key challenges

1. Building the evidence base around screening of vision problems for patients with acute stroke.
2. Development of a standardised screening tool, with recommendations for who should carry out the screening and at what stage.
3. Ensuring staff are aware of the impact of cognitive impairment and the impact of barriers to communication on screening.
4. Communicating the nature of the patient's visual impairment to the team, patient and family/carer.

Recommendations for Future Research

1. Establish validity/reliability of the STARS, and National institutes of Health Stroke Scale (NIHSS, which is currently used in hospitals as an initial screen for stroke patients) for detecting all types of vision problems following stroke.
2. Establish who should carry out the initial assessment of vision problems in stroke patients.

Statement 2: Best Practice for Visual Field Deficits

Key Points

1. All staff should be aware of the risks to patient safety caused by a visual field deficit.
2. Early detection, assessment and intervention requires specialist knowledge.
3. Interventions to reduce risks associated with visual field deficit should be implemented.
4. A combined rehabilitation approach including visual aids, scanning training, and visual field restitution is likely to produce the best outcome.

Statement	Rationale for the Statement	What will demonstrate the Statement is being achieved?
All stroke patients identified at screening as having a visual field deficit should be fully assessed.	Visual field deficits following stroke may go undetected. ^{1,2,6}	Assessment and outcome should be documented in patient notes.
A confrontation visual field test can be carried out. The patient covers each eye in turn and looks at the examiner. The examiner moves their hand out of the patient's view and brings the hand back into view until the patient reports that they can see the examiner's hand.	The confrontation visual field test can be delivered easily at the bedside, allowing for potential visual field deficits to be quickly identified. Early detection and intervention enhances the patient's ability to engage in functional activities and promotes risk reduction. ^{3,4,10,15}	The outcome of the confrontation visual field test should be documented in the patient notes.

<p>Patients should be told that there is a chance they will experience visual hallucinations.^{7,8}</p>	<p>Telling the patient in advance will warn them about the potential for hallucinations and reduce the patient's anxiety if hallucinations occur.^{6,7,8}</p>	<p>Patient notes will state that the patient/family have been informed about visual hallucinations.</p> <p>The patient/family will know that visual hallucinations might be experienced.</p>
<p>Staff should understand the risk to patient safety caused by their visual field deficit e.g. patients might bump into obstacles on the side of their deficit. The risk should be explained to the patient.</p>	<p>Patients risk injury from falling or bumping into things if they are not made aware of their deficit.^{1,4}</p>	<p>Documentation of staff training on the risks to patient safety caused by visual field deficits. Staff and patients will be aware of the risk to safety when asked.</p>
<p>Observe the patient at mealtimes and when they are participating in personal care. Provide assistance to patients who are struggling.</p>	<p>Some patients may be unaware that they neglect personal care and are unable to see food located on the side of their visual field deficit.</p>	<p>Observed problems will be raised with multi-disciplinary team and documented in patient notes.</p>
<p>Prisms could be applied to glasses by an Orthoptist.</p>	<p>Applying prisms to glasses could improve quality of life by moving the visual field to a more suitable position.^{12,13,14}</p>	<p>Use of prisms should be documented in patient notes.</p>

Interventions can combine visual aids, visual scanning training and visual field restitution. Progress of rehabilitation should be reviewed within an agreed timescale.	A range of interventions may maximise visual deficit training and support for patients. ^{2,3,4,5,}	Interventions should be documented in patient notes along with the outcome of the review.
Patients should be referred for assessment of their visual field deficit using the Humphrey Field Analyser, Goldman or equivalent.	Examination using the Humphrey Field Analyser, Goldman or equivalent will enable the extent of the visual loss to be mapped.	Referral for visual field assessment will be documented in patient notes, along with the outcome of assessment.
Arrange a review of visual field loss at 6 months.	There is a chance of spontaneous recovery of the visual field within the first 6 months post stroke. ^{2,3,5,11}	Date of follow-up assessment will be documented in patient notes.

Evidence Base

The current evidence base is poor, and the statements are based on available non-randomised control trial research and expert opinion. A recent Cochrane review⁹ concluded that there is some evidence to support compensatory scanning interventions, but the review was unable to draw conclusions on visual restoration therapy or prisms⁹.

References on which this statement is based

Chen *et al.*, 2006¹; Ajina & Kennard, 2012²; Celebisoy, *et al.* 2011³; Berryman *et al.*, 2010⁴; Cassidy *et al.*, 2001⁵; Chen & Liu, 2011⁶; Ashwin & Tsaloumas, 2007⁷; Assadi *et al.*, 2003⁸; Pollock *et al.*, 2011b⁹ Cunningham *et al.* 2004¹⁰; Ali *et al.* 2013¹¹; Bowers *et al.*, 2008¹²; Mueller *et al.* 2007¹³; O'Neill *et al.*, 2011¹⁴; Chen *et al.*, 2009¹⁵; Ghandehari *et al.*, 2011; Hayes *et al.*, 2012; Kasten *et al.*, 2001; Keller & Lefin-Rank, 2010; Modden *et al.*, 2011; Nelles *et al.*, 2001; Romano *et al.*, 2008; Schmielau & Wong, 2007; Bendo *et al.*, 2009; Bergsma *et al.*, 2012; Bergsma & van der Wildt, 2008 & 2010.

Links and Further Information

Cochrane review - <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008388.pub2/pdf>

Read-Right is a free rehabilitation tool which aims to improve reading ability in people who have visual field deficits - <http://www.readright.ucl.ac.uk/>

Key challenges

1. Ensuring visual field problems are highlighted to all members of staff who will come into contact with the patient.
2. Availability of specialist equipment and trained staff with specialist knowledge about stroke-related visual field deficit.
3. Rehabilitative techniques for visual field restoration are time consuming, and might be difficult to do in an acute setting.

Recommendations for Future Research

1. Good quality randomised controlled trials are needed to establish effectiveness of compensatory, restitutive and substitutive interventions.⁹
2. Good quality randomised controlled trials are needed to establish effectiveness of visual restoration therapy and application of prisms to glasses.

Statement 3: Best Practice for Eye Movement Disorders

Key Points

1. All staff working with stroke patients must be aware of the potential for eye movement disorders.
2. All patients should be screened for an eye movement disorder by suitably trained staff; this may be experienced medical staff, nursing staff or allied healthcare professionals.
3. Patients with eye movement disorders should be referred to orthoptic services.

Statement	Rationale for the Statement	What will demonstrate the Statement is being achieved?
All patients identified during screening as having an eye movement disorder should be assessed by suitably trained staff; this may be experienced medical staff, nursing staff or allied healthcare professionals.	The prevalence of eye movement disorders has been estimated as 20-57% and includes strabismus, gaze palsy, cranial nerve palsy, skew deviation and nystagmus. ¹	An audit of patient notes will identify that the assessment has been carried out and that the outcome of the assessment has been recorded.
Initial assessment by healthcare professionals should include assessment of ocular movements and include a question about diplopia, saccades and reading.	The visual impairments recognised by healthcare professionals after stroke typically only include visual field loss and visual inattention/neglect. ¹	The assessments will be recorded in patient notes, and an audit of patient notes will ascertain if ocular movements, diplopia, saccades and reading ability were assessed.

<p>If a deficit is detected on initial assessment, refer for orthoptic review.</p>	<p>Early detection of eye movement disorders may enable more effective rehabilitation.</p>	<p>Referral to orthoptic department should be recorded in patient notes and the number of referrals to orthoptic departments should be monitored.</p>
<p>Patching should be considered as initial treatment for diplopia.</p>	<p>Patching is accepted best practice for the immediate management of diplopia.</p>	<p>Treatment will be recorded in patient notes. The patch will be visible on the patients glasses.</p>
<p>Patients with eye muscle imbalance/diplopia should be monitored and, if appropriate, the use of Fresnel prisms, botulinum toxin injections or strabismus surgery should be considered.</p>	<p>The use of Fresnel prisms, botulinum toxin and surgery are accepted common practice.</p>	<p>Treatment will be recorded in patient notes.</p>
<p>Evidence Base</p> <p>The current evidence base is limited and this statement has been based on current best practice. A recent Cochrane Review reported that there is insufficient evidence to reach conclusions about the effectiveness of interventions.</p>		

References on which this statement is based

Rowe 2008¹ Pollock et al., 2011a²; Rowe, 2011; Choudhvir *et al.*, 2007; Ciuffreda 2008; Bolanos *et al.*, 2004; Ciuffreda *et al.*, 2006; Kruger *et al.*, 2007; Kapoor *et al.*, 2004; Dong *et al.*, 2013; Simon *et al.*, 2003; Ali *et al.*, 2013 and expert opinion.

Links and Further Information

Cochrane review - <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008389.pub2/pdf>

Key challenges

1. Improving healthcare professionals' awareness of eye movement disorders.
2. Assessing the reliability of the screening undertaken.
3. Ensuring staff are aware that eye movement disorders may be overlooked because they are difficult to detect if a systematic clinical examination is not undertaken.
4. Patients with eye movement disorders will report that there is a problem, but will often struggle to describe exactly what the problem is.

Recommendations for Future Research

1. Studies to establish the prevalence of stroke induced eye movement disorders².
2. Systematic review of non-randomised studies to establish current evidence base to enable development of well designed randomised control trials².
3. Good quality, rigorous randomised control trials which focus on patients with eye movement disorders caused by stroke are urgently required.
4. Randomised Control Trials should focus on common eye movement disorders (disorders of cranial nerve palsies, strabismus, saccadic palsy and dysmetria, nystagmus and reduced convergence).

Statement 4: Best Practice for Visual Neglect/Inattention

Key Points

1. All stroke patients should be assessed for visual neglect/inattention.
2. A test battery, such as the Behavioural Inattention Test should be used for full assessment of patients identified as having visual neglect/inattention.
3. Patients should be observed whilst completing tasks, as visual neglect might not be apparent during formal assessment.

Statement	Rationale for the Statement	What will demonstrate the Statement is being achieved?
Where patients are able, they should be initially assessed for visual neglect/inattention using a combination of tests such as the Star Cancellation Test, Line Bisection Test and Random Shape Cancellation Test.	The Behavioural Inattention Test takes time to administer. The Star Cancellation Test and Line Bisection have been found to be sensitive enough to detect visuospatial neglect in over 76% of cases ⁹ . The Random Shape Cancellation, Complex Line Bisection and Star Cancellation Test, when used together, detected neglect in 88% of cases ⁹ .	Assessment tools used for visual neglect and outcome will be documented in patient notes.
Patients identified initially as potentially having visual neglect/inattention should be assessed using a test battery such	A test battery such as the Behavioural Inattention Test, is more sensitive for identifying neglect than a single test, as different aspects of neglect will be assessed. ^{6,7,8,9,12}	Assessment and outcome will be documented in patient notes.

<p>Patients identified initially as potentially having visual neglect/inattention should be assessed using a test battery such as the Behavioural Inattention Test.</p>	<p>A test battery such as the Behavioural Inattention Test, is more sensitive for identifying neglect than a single test, as different aspects of neglect will be assessed. ^{6,7,8,9,12}</p>	<p>Assessment and outcome will be documented in patient notes.</p>
<p>A behavioural assessment such as Catherine Bergego Scale should be used to assess for visual neglect in everyday situations and to assess the patient's awareness of their visual neglect.</p>	<p>Behavioural tests in combination with pen and paper tests have the greatest sensitivity for detecting visual neglect in addition to assessing for the functional implications of visual neglect. ^{2,3,4,5}</p>	<p>Assessment used for visual neglect and outcome will be documented in patient notes.</p>
<p>Patients should be approached from their non-neglected side and spoken to as approached.</p>	<p>This will ensure patients are aware when staff and visitors approach them ^{3,8,13,20} and will avoid startling them.</p>	<p>Staff and family will have awareness about the importance of approaching patient on their non-neglected side.</p>
<p>Patients should be observed when completing tasks.</p>	<p>Some patients might not present with visual neglect until completing complex activities of daily living. ^{14,15,16,17,18}</p>	<p>Problems identified during observation will be documented in patient notes.</p>
<p>Visual cueing, visual scanning training and prism adaptation can be used to encourage patients to</p>	<p>These rehabilitative techniques are the most feasible and generalisable for clinical practice. ^{1,19}</p>	<p>Rehabilitation for visual neglect will be documented in patient notes.</p>

Evidence base

The evidence used to develop this statement is based on non-randomised control trials and expert opinion. A Cochrane review published in 2007¹⁰ and updated in 2013¹¹ reports that the effectiveness of cognitive interventions is still unproven. However the review does report that there is some evidence that cognitive rehabilitation has an effect.

References on which this statement is based

Kerkhoff & Schenk, 2012¹; Azouvi et al., 2002²; Chen *et al* 2012³; Broeren *et al.* 2007⁴; Bickerton *et al.* 2011⁵; Ferber & Karnath, 2001⁶; Bailey, Riddoch, & Crome, 2000⁷; Beis et al., 2004⁸; Lindell et al., 2007⁹; Bowen & Lincoln, 2007¹⁰; Bowen *et al* 2013¹¹; Appelros *et al.* 2004¹²; Buxbaum *et al.* 2012¹³; Bonato *et al.* 2010¹⁴, 2011¹⁵ and 2013¹⁶; Bonato 2012¹⁷; Brunila *et al.* 2010¹⁸; Lavery and Rowe, 2012¹⁹; Dvorkin *et al.* 2007²⁰; Karnath *et al.* 2011²¹; Newport & Schenk, 2012; Luaute *et al* 2006; Bailey, Riddoch, & Crome 2004; Cooke *et al.* 2005; Appelros *et al.* 2002; Cooke *et al* 2006a and b; Agrell & Dehlin 1998,., Cherney & Halper 2001; Cumming *et al.* 2009; Song *et al.*, 2009; Cazzoli *et al.*, 2012; Ansuini *et al.*, 2006; Leibovitch 2012; Cumming et al. 2010.

Links and Further Information

Cochrane reviews - <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003586.pub2/pdf>
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003586.pub3/pdf>

Key challenges

1. Few studies address the role of healthcare professionals in managing patients' symptoms of neglect.
2. A number of the treatment methods suggested for patients who have neglect are currently under exploration. These treatment methods include sensory stimulation, optokinetic stimulation and virtual reality tools. The resource implications for setting up, maintenance, and staff training costs make these techniques limited in their application to clinical practice.

Key challenges

1. Few studies address the role of healthcare professionals in managing patients' symptoms of neglect.
2. A number of the treatment methods suggested for patients who have neglect are currently under exploration. These treatment methods include sensory stimulation, optokinetic stimulation and virtual reality tools. The resource implications for setting up, maintenance, and staff training costs make these techniques limited in their application to clinical practice.
3. Techniques which are recommended still require good quality randomised control trials to understand effectiveness of the interventions.

Statement 5: General Guidance

Key Points

1. Clear pathways for assessment and management of vision problems should be available in the ward.
2. Patients and family members/carers should be given clear information about identified vision problems.
3. Patients should be provided with a follow up appointment and directed to voluntary services before discharge.
4. Patients should be asked if they intend to drive following a stroke and, if so, assessed for driving competencies before they do.

Statement	Rationale for the Statement	What will demonstrate the Statement is being achieved?
Clear care pathways for assessment and management of vision problems should be available in the ward. Appointments for follow-up assessment should be made before discharge.	This will ensure that there is a clear pathway for the care received by the patient and that follow-up assessments are in place before discharge.	Follow up appointments will be documented in patient notes before discharge.
Physical, communication and cognitive difficulties should be taken into account when screening for vision problems and selecting interventions.	These problems are common after stroke.	Physical, communication, and cognitive difficulties will be documented in patient notes along with their impact on screening and interventions.

<p>Adequate lighting should be provided. Reading aids and corrective glasses should be worn if previously prescribed.</p>	<p>This will allow patients to recover in optimal visual circumstances.</p>	<p>Observation of the environment will identify if reading aids are available.</p>
<p>Staff should receive training about stroke related vision problems. The STARs module is freely accessible at: (http://www.strokeadvancingmodules.org/node.asp?id=advancing).</p>	<p>Provision of training will improve understanding of vision problems and help ensure the provision of appropriate support.</p>	<p>Training will be documented in staff personal development plans.</p>
<p>Ensure effective written and verbal communication between all members of the multi-disciplinary team about the extent and type of vision problem.</p>	<p>This will enable the multi-disciplinary team and others to provide appropriate support.</p>	<p>Patient notes will evidence that the vision problem has been conveyed during staff meetings. Members of the multi-disciplinary team will be aware of the vision problem.</p>
<p>Staff should be aware that patients may be experiencing anxiety problems due to their vision problem.^{1,2,3}</p>	<p>Going from sighted to visually impaired, suddenly and without warning, is traumatic (Rosalind Jack, Patient Representative).</p>	<p>Staff will be aware that the patient may be anxious.</p>

<p>Patients and their family/carer should be made aware of the type and extent of the vision problem.</p>	<p>This will increase the family/carer's understanding of the problem and ensure they have the information they need to provide the patient with appropriate support.</p>	<p>The patient notes will evidence the content of the discussion.</p>
<p>Where possible information being conveyed to the patient about the type and extent of vision problems should be communicated in the presence of a family member.</p>	<p>The patient might experience short-term memory problems and be unable to retain even simple information, particularly when they are anxious. Some would prefer a family member to be present when their condition is being discussed, as their relative can make notes for future reference.</p>	<p>The patient notes will evidence when the discussion took place and who was present.</p>
<p>Patients should have access to audio facilities, large print magazines, books and anglepoise lamps for reading where possible.</p>	<p>Access to media will provide patients with some recreation.</p>	<p>A selection of appropriate media will be available on the ward.</p>
<p>Patients and their family/carer should be advised of relevant voluntary organisations before discharge (please see page 37 for a list of some charities).</p>	<p>Voluntary services provide support after discharge and advice about how to register as partially sighted.</p>	<p>Referral will be evidenced in patient notes.</p>

Spectacles which simulate various types of visual impairment should be available to family and carers where possible.	This will improve awareness and understanding amongst family and carers as to the extent of the patient's vision problem.	Spectacles will be available on the ward.
All patients should be asked if they intend to drive following a stroke. Those who do should be assessed for driving competencies when able by a person trained in these assessments. ^{4,5}	To ensure safety of the patient and others.	Intention to drive will be documented in patient notes with referral for assessment of driving competencies.
<p>Evidence Base</p> <p>The evidence base is poor. This statement is based on good clinical practice, clinical expertise, and patient experience.</p>		
<p>References on which this statement is based</p> <p>Ashwin & Tsaloumas, 2007¹; Assadi <i>et al.</i> 2003²; Chen & Liu 2011³; Chen, Chen, & Hong, 2006⁴; Cunningham et al 2004⁵.</p>		
<p>Links and Further Information</p> <p>STARs module: http://www.strokeadvancingmodules.org/node.asp?id=advancing</p> <p>The STARs module includes the following sample visual screening form within the vision modules http://labyrinth.mvm.ed.ac.uk/files/1384/Visual_Screen_for_Stroke.pdf</p> <p>Stroke Competency Tool Kit: http://www.scotonline.org/</p> <p>Information on visual requirements for driving can be found on the DVLA website: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200395/aagv1.pdf</p>		

Key challenges

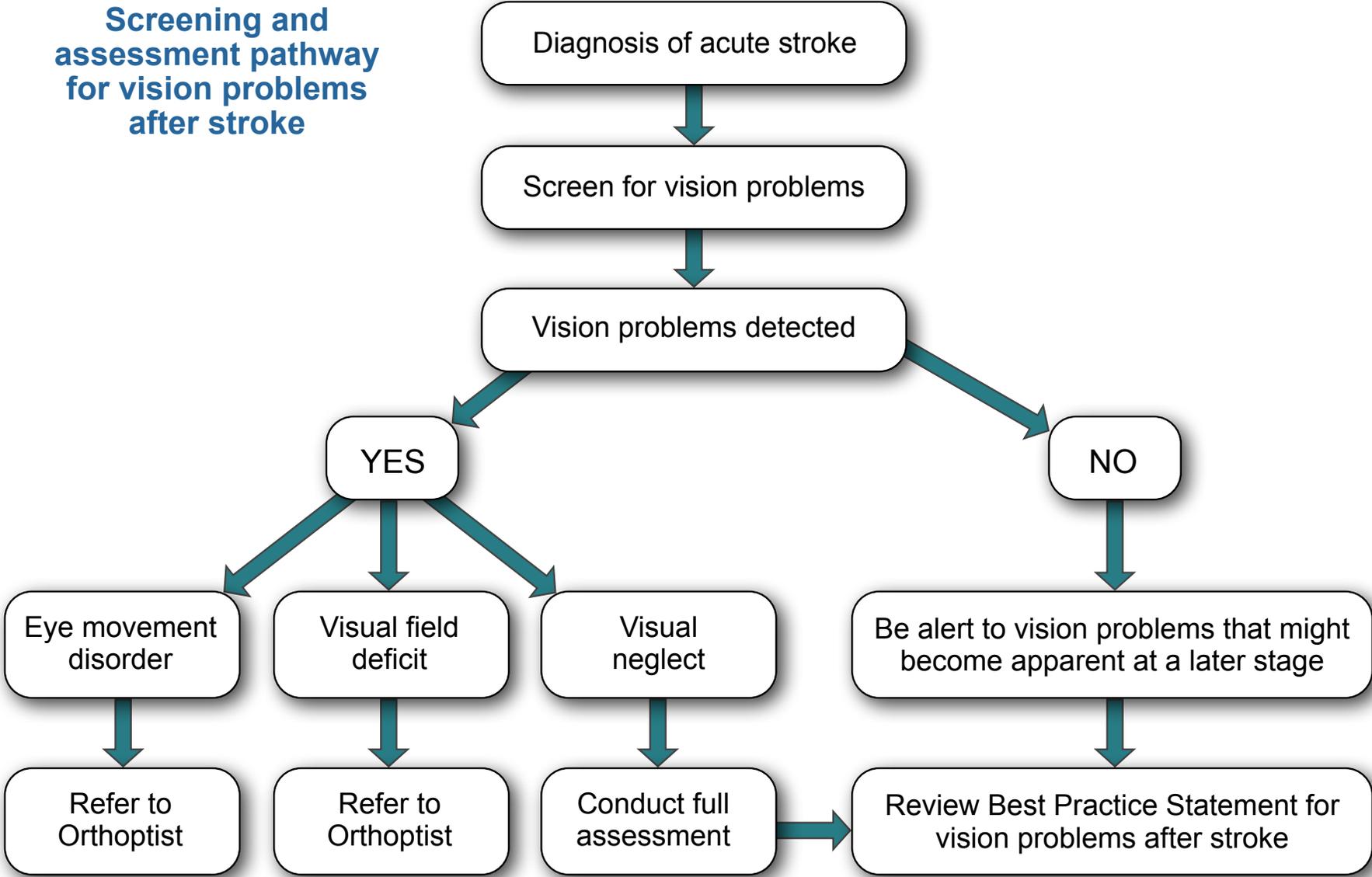
1. Ensuring that all staff who come into contact with the patient are aware of the vision problem - many vision problems are hidden and not immediately obvious.
2. Ensuring that patients not admitted to the stroke ward have their vision assessed.
3. Ensuring that family/carers understand the potential impact of the patient's vision problem.
4. Ensuring that patients and family/carers are directed to voluntary organisations.

Recommendations for Future Research

1. Evaluation of the impact of the Best Practice Statement.
2. Evaluation of the impact of stroke training.
3. Qualitative research to identify concerns of the patient and family.
4. Good quality randomised control trials and comparative studies to measure the outcome of interventions.

Figure 1: Decision Flow Chart

Screening and assessment pathway for vision problems after stroke



3: Description of the Methods

3.1 Methodology

The method used to develop this Best Practice Statement is an adaptation of one previously developed by NHS QIS.

Prior to the start of the project, three multi-disciplinary teams were formed which comprised: a Steering Group to advise on the project and to oversee the development of the BPS; a Working Group to review the literature and develop a statement for the topic they were reviewing, and a Critical Reading Group to review and comment on the draft statement. Contributors to the development of the BPS are listed in Appendix 1. The key stages in the development of the BPS are outlined in Figure 2 (page 28).

3.2: Aim

The literature review being undertaken for the purpose of developing the BPS aimed to answer the following question:

“What is the best practice for the screening, assessment and management of vision problems in the acute phase of stroke?”

3.3: Scoping the Literature

The scope of the literature search was defined by the project Steering Group. Four topics were agreed:

1. Initial screening on presentation in hospital.
2. Visual field deficits.
3. Eye movement disorders.
4. Visual inattention/neglect.

3.4: Search strategy

The search strategy was developed with guidance from the Steering Group and a librarian at the University of Glasgow. A Rapid Evidence Assessment (REA) method was used to identify literature relevant to the project. A REA is a systematic process that uses a well-defined process to search a specified range of databases for literature relevant to the topic of investigation. It is rapid because the search is narrowed to answer, identify, review, and select literature relating to specific questions and the timescale for completion is limited to 6 months. The output from a REA contributes to the development of a guideline that is based on the best evidence available at the time for the

problem being investigated.

A systematic search for each of the four topics was conducted. The following databases were searched:

- Cochrane Library
- Medline
- EMBASE
- CINAHL
- PsycINFO
- Web of Science
- British and Irish Orthoptic Journal. (Hand search)

3.5: Search Priorities

The priorities for the literature search were to:

- Identify empirical research;
- Identify literature reviews and systematic reviews;
- Identify grey literature.

3.6: Keywords

Stroke, subarachnoid hemorrhage, subarachnoid haemorrhage, clinical examination, screening, assessment, test, vision, visual perception, perceptual disorders, inattention, optic ataxia, extinction, agnosia, scotoma,

cancellation task, line bisection, patching, prism adaptation, scanning training, visual field, visual field deficit, hemianopsia/hemianopia/hemianopic, visual field enlargement, visual field loss, visual restoration therapy, visual hallucination, Charles Bonnet, low vision, depth perception, ocular motility, conjugate eye deviation, diplopia, squint, ocular mobility disorder, saccade, vestibular ocular reflex, eye movement disorder, visual pathway, strabismus, ocular cranial nerve palsy, nystagmus, gaze palsy, oscillopsia.

Keywords were combined for the purposes of the literature search.

3.7: Search Parameters

Only papers that met the inclusion and exclusion criteria were included in the initial review.

3.8: Inclusion Criteria

- Written in English
- Relate to humans
- Contain an abstract
- Published between 2000 to 2013

Literature published before 2000 was included if it was considered to be seminal work.

3.9: Exclusion Criteria

Literature relating to paediatric care and literature describing rehabilitative techniques for chronic stroke were excluded, as this best practice statement is concerned with the acute phase of stroke in adults.

3.10: Search Results

Over 9,000 references were initially identified. These were reduced by removing all duplicates, and those which did not include an abstract. Abstracts which did not contain information relevant to the BPS were also removed. The remaining papers were reviewed by members of the working group. Due to the high yield of papers relating to 'visual inattention/neglect' (n = 110), an expert member of the Working Group (Appendix 1) was asked to identify and select reviews which detailed the different types of rehabilitative techniques and their effectiveness.

Of the 9,032 papers initially identified, 234, including nine Cochrane Reviews, were reviewed by the Working Group.

The number of papers identified at each point of the review process is detailed in Figure 3 (page 29).

3.11: Working Group

The Working Group comprised academics and healthcare professionals with combined expertise in stroke care and related vision problems. Members of the review team met as a group at the start of the review process and again mid way through the process. In preparation for the first meeting, members completed a short questionnaire indicating their previous review experience and confirmed their area of expertise. This process guided the formation of four small teams of 4-6 members with expertise in the topic they were reviewing, and at least one member who had previous review experience.

In addition to two face-to-face meetings for all working group members, members of the smaller teams consulted with each other virtually, or face-to-face, to reach consensus about the quality of the papers they were reviewing. Each group was provided with a copy of The Critical Appraisal Skills Programme (CASP UK) critical

appraisal tools and an adapted version of the SIGN (2012) 'Considered Judgement Form' (SIGN 2012).

3.12: Patient Representation

Two patients with stroke-related vision problems contributed to the project by providing information and suggestions for the best practice statements. These are embedded throughout the document.

3.13: Critical Reading Group

The Critical Reading Group (Appendix 1) was asked to review the draft BPS most relevant to their area of expertise and comment on other sections where possible. A feedback sheet was provided for this purpose. Suggested revisions were notified to the Steering Group

and relevant Working Group. Following discussion with and within these groups, a consensus was reached and revisions made where appropriate.

3.14: Consultation and Dissemination

In developing this document we have consulted with a wide range of individuals and organisations across Scotland, many of whom are raising awareness of the BPS and associated Quick Summary Guide. A dissemination plan has been developed and implemented. Both the BPS and the Quick Summary Guide can be accessed at www.glasgow.ac.uk/bpsvision.

Figure 2: Key stages in the development of the BPS

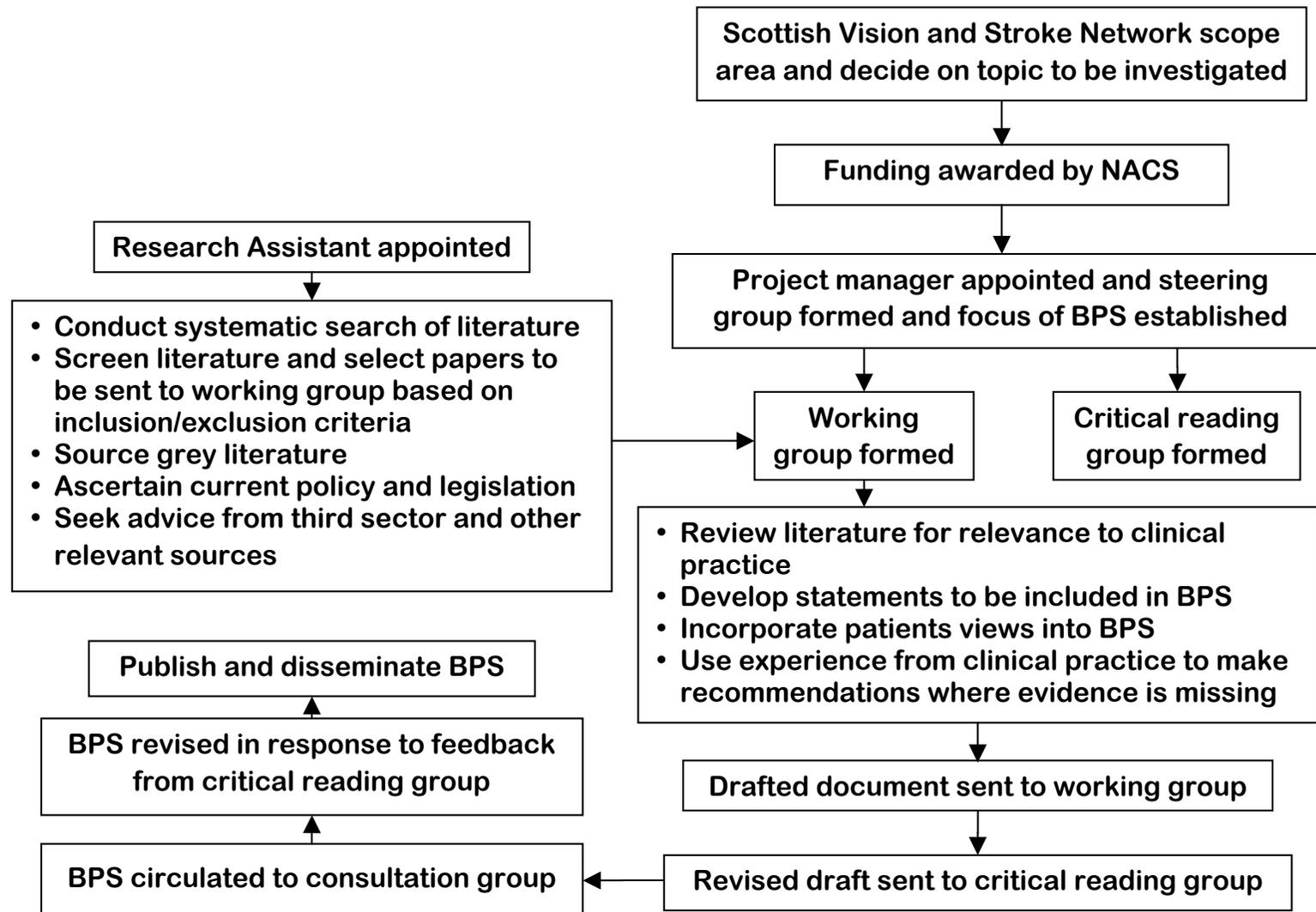
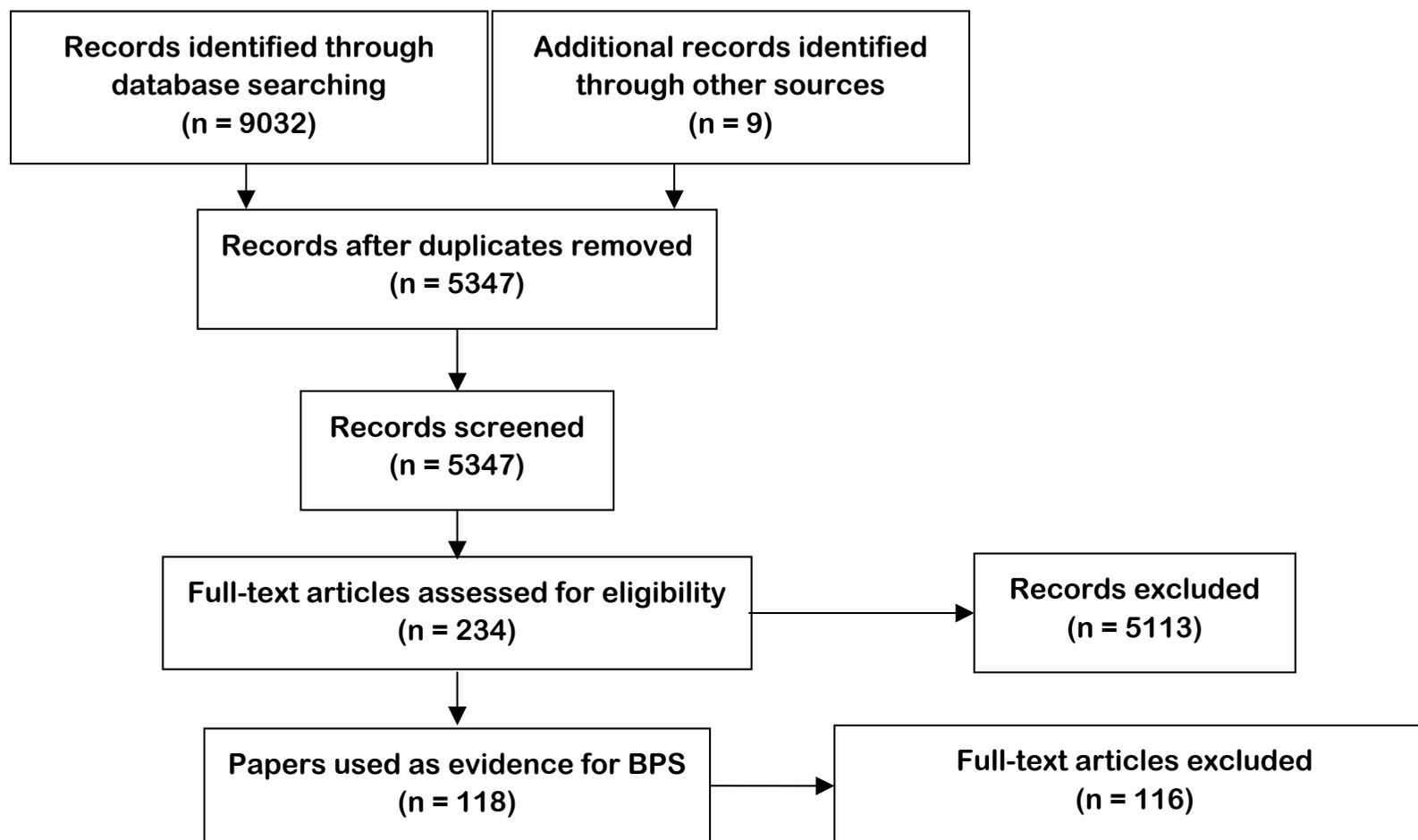


Figure 3: Review Process

Literature search strategy and number of papers included at each stage.



Appendix 1

Contributors to the development of the Best Practice Statement

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Appendix 2

Keywords which relate to vision

Word	Definition
Agnosia	Inability to recognise a sensory input despite no problem with the related sense or significant memory loss.
Cancellation Task	Assessment measure of a person's ability to actively explore the visual world. The patient is given a sheet of paper with visual targets (shapes, letters, etc) and asked to cross out a specified targeted. A patient with neglect, typically misses some or all of the targets on their affected side.
Conjugate Eye Deviation	A pathological condition where both eyes are turned to the same side as a result of paralysis or muscular spasms.
Depth Perception	Ability to see the world in three dimensions.
Diplopia	A condition where the patient sees two images of the same object (double vision).
Dysmetria	A lack of coordination when making eye movements causing an undershoot or overshoot of the eye when looking at an object/target. This can cause problems with judging distance or scale.
Extinction	A patient, normally with damage to the right parietal lobe, is unable to report an object when it is presented to their affected side at the same time as an identical object is presented to the unaffected side.
Eye Movement Disorder	Problems with the muscles of the eye. The ability to move both eyes properly in order to look at an object is impaired.
Gaze Palsy	Inability to move both eyes in the same direction. Can affect eye movements in

	horizontal and vertical directions.
Hemianopia/Hemianopsia/Hemianopic	Loss of vision in either the left or right visual field.
Inattention	Inability to notice stimuli which is presented to the affected side of the body, even though vision is intact.
Line Bisection	An assessment measure for neglect. The patient is asked to make pencil marks through the midpoint of plain horizontal lines.
Low Vision	Reduced vision, even when using the best corrective lenses.
Neglect	Inability to orientate to, respond to, or report stimuli presented on the affected side of the body.
Nystagmus	Involuntary eye movements that can result in reduced vision.
Ocular Cranial Nerve Palsy/Cranial Nerve Palsy	The oculomotor nerve (third cranial nerve) supplies the majority of muscles which move the eye. Damage to this nerve causes problems with moving the eye correctly.
Ocular Mobility Disorder	Problems with making accurate eye movements.
Ocular Motility	Voluntary and involuntary movement of the eye.
Optic Ataxia	Inability to guide the hand toward an object using visual information.
Optokinetic Stimulation	A therapy for patients with visual neglect where stimuli are presented on a horizontally moving background which is believed to temporarily move the patient's area of awareness.
Oscillopsia	Visual disturbance where objects appear to oscillate.
Patching	Eye patches are used to relieve double vision and can help to reduce dizziness,

	vertigo and nausea.
Prism Adaptation	Used to rehabilitate visuo-spatial deficits. Patients wear goggles with prisms which shift the visual field in a leftward or rightward direction. Whilst wearing the goggles the patient performs visual motor tasks such as pointing to objects.
Reduced convergence	Reduced ability for the eyes to turn towards each other.
Saccade	Series of involuntary and abrupt small movements of both eyes which change the point of fixation.
Scanning Training	Encourages patients to look systematically to the left and right of a scene to reduce the amount of visual information they miss.
Scotoma	Small blind spot in the visual field.
Sensory Stimulation	A therapy which uses multiple sensory inputs (sight, hearing, touch, taste and smell) to improve mental function and understanding of the environment.
Strabismus (Squint)	A condition where eyes are not properly aligned due to lack of coordination between extraocular muscles. Causes problems with binocular vision and can affect depth perception.
Stroke	Sudden appearance of neurological problems which results from interrupted blood flow to the brain.
Subarachnoid Haemorrhage	A type of stroke caused by bleeding in and around the brain.
Vestibular Ocular Reflex	A reflex of eye movements which stabilises images on the eye as the head moves. It produces eye movements in the opposite direction to the head movement.
Virtual Reality Tools	Use of programmed computers, visual immersion devices and artificially created

	environments to give a patient a simulated experience that reflects real-life situations.
Visual Field	Total area in which objects can be seen whilst the eyes are focusing on a central point.
Visual Field Deficit	Loss of part of the visual field.
Visual Field Enlargement	Enlargement of the damaged visual field following intervention.
Visual Hallucination (Charles Bonnet)	Common after visual field loss. Causes the patient to see things which are not there. Hallucinations are not usually permanent.
Visual Pathway	A route which visual information follows from the eye to the visual cortex at the rear of the brain (occipital lobe). Damage caused by a stroke at any point on this pathway can cause disturbance of vision.
Visual Perception	How visual information is interpreted by the brain.
Visual Restoration Therapy	Non-invasive, computer based therapy used to help patients with visual field deficits. It involves fixating on a central point whilst responding to points as they appear somewhere on the screen.

Charities and Organisations

Action for Blind People - www.actionforblindpeople.org.uk/

British and Irish Orthoptic Society - <http://www.orthoptics.org.uk/>

Chest Heart and Stroke Scotland - <http://www.chss.org.uk/>

Different Strokes – Support for Younger Stroke Survivors - <http://www.differentstrokes.co.uk/>

Guide Dogs for the Blind - <http://www.guidedogs.org.uk/>

Joint Sensory Services Scotland - http://www.rnib.org.uk/aboutus/contactdetails/scotland/vss/Pages/joint_sensory_scot.aspx

Nystagmus Network - <http://www.nystagmusnet.org/cms/>

Royal London Society for Blind People (RLSB) - <http://www.rlsb.org.uk/>

Royal National Institute of Blind People (RNIB) - <http://www.rnib.org.uk/Pages/Home.aspx>

See Ability - www.seeability.org/

Stroke Association - www.stroke.org.uk/

The Partially Sighted Society - www.partsight.org.uk/

Visibility - www.visibility.org.uk/

Vision 2020 UK - <http://www.vision2020uk.org.uk/>

Vocal Eyes - <http://www.vocaleyes.co.uk/>

Stroke for careers - Information for carers - www.stroke4carers.org

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