



# **PRESCRIBING SPECTACLES FOR PRESBYOPIA**

## **THINK**

A 45 year old man comes to see you for an eye examination. He tells you that he is worried because he cannot see things that are close to him as well as he used to. You know that this is probably because he has presbyopia.

You do a refraction and find that the man has a small amount of astigmatism, but not enough to disturb his distance vision. You do a near refraction and find that he also has presbyopia, which is the cause of his poor near vision. How will you decide what power spectacles to prescribe for him so that he can see clearly at near?

## **AIM**

This unit explains how to prescribe a near lens addition for a person with presbyopia so that they can have clear and comfortable near vision.

## **LEARNING OUTCOMES**

When you have worked through this unit you should be able to:

- prescribe near spectacles for a person by looking at their refraction results and by considering their case history, visual needs and previous spectacles
- adjust the add power to make it stronger or weaker depending on the person's needs
- describe the advantages and disadvantages of different types of spectacle lenses for near
- tell a person what they need to know about their new near spectacles.

## REVIEW: PRESCRIBING SPECTACLES FOR PRESBYOPIA

<b>PRESBYOPIA</b>	<ul style="list-style-type: none"> <li>The gradual (slow) loss of accommodation as we get older is called presbyopia.</li> <li>Presbyopia affects everyone and usually starts around the age of 40.</li> <li>People with presbyopia usually find it difficult to read or do other near tasks.</li> <li>If a presbyope also has hyperopia or myopia, it will affect them when they need to get spectacles for close work. Some people who have myopia may never need to wear reading spectacles.</li> </ul>
<b>CAUSE OF PRESBYOPIA</b>	<ul style="list-style-type: none"> <li>As we get older, the crystalline lens gradually gets harder and cannot change shape easily when the ciliary muscle contracts – this is a normal, natural aging process.</li> <li>This means that an older person cannot accommodate as much or as easily as a younger person.</li> </ul>
<b>PRESBYOPIA SYMPTOMS</b>	<ul style="list-style-type: none"> <li>People with presbyopia may have trouble doing near tasks such as reading, sewing, and sorting rice. This is because they have blurry vision when they look at things that are close to them.</li> </ul>
<b>CORRECTION OF PRESBYOPIA</b>	<ul style="list-style-type: none"> <li>Presbyopia is corrected with a near addition (or “add”).</li> <li>The add is a positive spherical lens power that is added to the distance correction that a person needs so that they can see their near work clearly.</li> <li>Distance Spectacle Prescription + Near Addition = Reading / Near Spectacle Prescription.</li> </ul>
<b>TYPES OF PRESBYOPIA SPECTACLES</b>	<ul style="list-style-type: none"> <li>Reading spectacles: <ul style="list-style-type: none"> <li>are only worn for close work</li> <li>make close vision clear, but distance vision blurry</li> <li>must be taken off for clear distance vision.</li> </ul> </li> <li>Bifocal spectacles: <ul style="list-style-type: none"> <li>have two parts divided by a line: the top part has power for distance vision, while the bottom part (the “seg”) has power for near vision</li> <li>allow a presbyopic person to see clearly both at near and in the distance.</li> </ul> </li> <li>Progressive addition spectacles: <ul style="list-style-type: none"> <li>do not have a line like bifocals: the distance prescription at the top of the lens gradually blends with the near prescription at the bottom of the lens</li> <li>allow a presbyopic person to see clearly both at near, far away, and at an intermediate distance.</li> </ul> </li> </ul>
<b>LENS ADDITION</b>	<ul style="list-style-type: none"> <li>Near addition (add) is not the same as near spectacle prescription.</li> <li>The add is the extra amount of plus power that must be added to the person’s distance prescription so that they can see clearly at near.</li> <li>Distance prescription + Near add = Near spectacle prescription.</li> </ul>
<b>STRENGTH OF THE NEAR ADD</b>	<p>The near add strength depends on:</p> <ul style="list-style-type: none"> <li>age</li> <li>preferred working distance</li> <li>best corrected distance VA.</li> </ul>

## REVIEW: PRESCRIBING SPECTACLES FOR PRESBYOPIA (cont.)

<b>PREFERRED WORKING DISTANCE</b>	<ul style="list-style-type: none"> <li>• This is the distance that a person likes to keep between their eyes and their close work. It is usually 40 cm, but may be closer or further away.</li> <li>• Smaller people usually have closer working distances than larger people.</li> <li>• A stronger add is needed for people who have closer working distances than for people who have working distances further away.</li> <li>• The preferred working distance needs to be determined during the case history.</li> </ul>
<b>RANGE OF CLEAR VISION</b>	<ul style="list-style-type: none"> <li>• A presbyope who wears near spectacles has a limit to how close and how far away they can see when they are wearing their spectacles.</li> <li>• The range of clear vision describes the distances where the person's near vision is clear.</li> <li>• A good pair of near spectacles is prescribed so that the person's preferred working distance is in the centre of the range of clear vision.</li> <li>• A person's range of clear vision decreases as they get older.</li> </ul>
<b>REFRACTION CHECK</b>	<ul style="list-style-type: none"> <li>• When you have finished your refraction, you need to double-check your results <ul style="list-style-type: none"> <li>– is the person's vision clear and comfortable?</li> </ul> </li> <li>• Show the person the limitations of their new spectacles <ul style="list-style-type: none"> <li>→ perhaps distance vision is clear but near vision is blurry</li> <li>→ perhaps near vision is clear but distance vision is blurry.</li> </ul> </li> </ul>
<b>BEFORE YOU PRESCRIBE</b>	<ul style="list-style-type: none"> <li>• Some conditions and medication can cause a person's refraction to change. These include: <ul style="list-style-type: none"> <li>– people with diabetes</li> <li>– women who are pregnant</li> <li>– people taking some medications (including some anti-depressants, anti-psychotics and steroids).</li> </ul> </li> </ul>
<b>PRESCRIBING SPECTACLES</b>	<ul style="list-style-type: none"> <li>• Always tell people that new spectacles take time to get used to: <ul style="list-style-type: none"> <li>→ Allow 2 weeks for adaptation</li> <li>→ Tell the person to come back after 2 weeks if they are still having difficulties with their new spectacles.</li> </ul> </li> </ul>



## PRESCRIBING SPECTACLES FOR NEAR

At the end of your near refraction, you will have decided:

- if the person's chief complaint and symptoms are caused by a near vision problem
- whether or not near spectacles can be used to correct the person's problem
- what the spectacles should be used for (such as near tasks only).

Based on the person's case history, their visual needs, and their previous spectacles you will decide whether or not to prescribe:

- spectacles for all of the person's refractive error or only some of the person's refractive error
- more than one pair of spectacles for the person's different visual needs.

<b>CASE HISTORY</b>	<p>The case history tells you what problems a person is having with their near vision.</p> <ul style="list-style-type: none"> <li>• What the person tells you about their near vision will help you decide what power near spectacles to prescribe.</li> <li>• Most people who are older than 40 years old will need spectacles to see clearly at near – but some do not.</li> </ul> <div data-bbox="432 801 560 904">  </div> <p>If the person does not think that they have a problem seeing things that are close to them: Do not prescribe near spectacles!</p>
<b>VISUAL NEEDS</b>	<p>A person probably does not need near spectacles if:</p> <ul style="list-style-type: none"> <li>• they do not need to see things that are close to them well</li> <li>• they can see N8 without spectacles</li> <li>• they have a near prescription of less than +1.00 D.</li> </ul> <p>A person probably needs spectacles if:</p> <ul style="list-style-type: none"> <li>• they cannot see N8 without spectacles</li> <li>• they say that their near vision looks better with the new spectacle prescription for near.</li> </ul> <p>You also need to consider what type of near spectacle lenses a person may need:</p> <ul style="list-style-type: none"> <li>• single vision lenses</li> <li>• bifocal lenses</li> <li>• progressive lenses</li> <li>• readymade spectacles.</li> </ul> <div data-bbox="432 1420 560 1523">  </div> <p>Sometimes a person needs more than one pair of spectacles for different tasks. <b>Example:</b> A man might like to wear bifocal spectacles to wear during the day, but he might also like another pair of single vision near spectacles to wear when he reads the newspaper in the evening.</p>
<b>PREVIOUS SPECTACLES</b>	<p>Always ask the person whether they have had spectacles for near work before:</p> <ul style="list-style-type: none"> <li>• Ask how old these spectacles are</li> <li>• Ask about their vision with these spectacles</li> <li>• Ask whether they like the spectacle frame</li> <li>• Measure the power of the spectacles</li> <li>• Let the person compare their vision with the new near prescription and with their previous spectacles.</li> </ul> <p>If the person already has near spectacles, usually you will prescribe new spectacles if:</p> <ul style="list-style-type: none"> <li>• the person cannot read N8 on the near chart with their previous spectacles</li> <li>• there is more than 0.50 D change in their prescription</li> <li>• their spectacles are more than 2 years old</li> <li>• the person says their vision is worse with their previous spectacles.</li> </ul>

## PRESCRIBING SPECTACLES FOR NEAR (cont.)

<b>PREVIOUS SPECTACLES (cont.)</b>	<p>If the person has never worn near spectacles before, you may need to adjust their prescription:</p> <ul style="list-style-type: none"> <li>If their near prescription is quite high, you may need to prescribe weaker lenses initially, to make it easier for them to adapt to their new spectacles.</li> </ul>
<b>EXAMPLE</b>	<p>A woman comes to you and tells you that she is having trouble seeing at near to sew. She has never had spectacles before. Her refraction is:</p> <p style="text-align: center;">R plano                      L plano                      Add +2.25</p> <p style="text-align: center;">You should think about prescribing only R +1.75 D    L +1.75 D</p> <p>Her vision will still be much better, and she will be able to adjust to her new spectacles more easily than she would if you had prescribed the full near add – since this is her first time wearing spectacles.</p>

## THE NEAR ADD AND THE WORKING DISTANCE

<b>PREFERRED WORKING DISTANCE</b>	<p>Although we usually measure the near addition at 40 cm (or the person's preferred working distance), we need to remember that usually people also need to see things that are a little further away from them.</p>
<b>EXAMPLES</b>	<ul style="list-style-type: none"> <li>A carpenter needs to see the wood and tools that he is working with, but he also needs to see other things that are on his work table.</li> <li>An office worker needs to be able to do her paperwork, but she also needs to be able to see the other things on her desk and her computer screen.</li> <li>A cook needs to be able to see the vegetables that he is cutting, but he also needs to be able to watch the pot on the stove next to him.</li> </ul>
<b>PRESCRIBING WEAKER AND STRONGER ADDS</b>	<p>Sometimes you will need to prescribe a weaker or a stronger add. This usually depends on the person's visual needs.</p> <p>A weaker add may be prescribed if the person:</p> <ul style="list-style-type: none"> <li>will only use their spectacles for a computer screen (this is usually further away than their normal reading distance)</li> <li>has a special job where they need to be able to see things that are a bit further away clearly.</li> </ul> <p>A stronger add may be prescribed if the person:</p> <ul style="list-style-type: none"> <li>wants to see things closer than their normal reading distance. → <i>For example:</i> A woman might like to hold her embroidery closer to her eyes than she would normally hold a book.</li> <li>wants to see very small objects. If the add is increased the range of clear vision will move closer to the person – and when we hold things closer to our eyes they appear to be larger. This is like using a magnifying glass. → <i>For example:</i> A watch repairer may need to hold the watch 20 cm away from him to see the mechanics clearly.</li> <li>has low vision. A high add may be necessary if the person cannot see clearly at a normal working distance. → <i>For example:</i> An elderly man can only see N12 with a +2.50 D add at 40 cm. If his add is increased to a high add of +4.00 D he can see N6 if he holds the reading card at 25 cm. The man will have to learn to hold things closer if he wants to wear a high add to see near objects clearly.</li> </ul>

## CHOICE OF LENS FOR SPECTACLES



Spectacles for near vision are sometimes called “reading” spectacles because they can help a person read.

However, near spectacles can also be used for other near tasks such as sewing, cooking, carving wood, weaving or making jewellery.

Different people use their vision for different tasks. This is why no one type of spectacle lens is right for every person. You need to discuss the different types of spectacle lenses that are available with the person; tell them about the advantages and disadvantages of each type of lens – then let them decide what type of lens they prefer.

### SINGLE VISION LENSES

- These can be spherical lenses or astigmatic lenses, and have just one power.
- These spectacle lenses let a person see clearly at near, but if they look in the distance with these lenses, it will look blurry.
- Near spectacles with single vision lenses must be taken off if the person wants to look in the distance.
- Sometimes, instead of taking their spectacles off, the person can look over the top of their spectacles. If the person wants to do this, it is better if they have a small spectacle frame. Spectacles like this are sometimes called “look-overs”.
- If a person decides to get single vision near spectacles, you should show the person that their vision will be blurred in the distance by using the trial frame, otherwise the person might be surprised by and disappointed with their new spectacles.



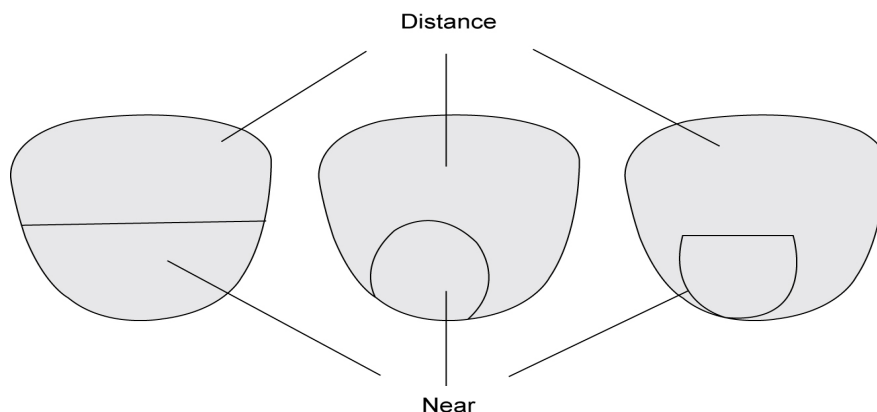
**Figure 24.1:** A man wearing look-over reading spectacles. He looks through the near spectacle prescription lenses to read his book and looks over them to see things that are in the distance.

## CHOICE OF LENS FOR SPECTACLES (cont.)

### BIFOCAL LENSES

Bifocal spectacles have two powers in the same lens: the top part of the lens is for distance vision and the bottom part of the lens is for near vision.

The bottom part of the lens is often called a “segment”, or simply a “seg”.



**Figure 24.2:** Bifocal lenses come in several different seg sizes and shapes

- Bifocal spectacles are more expensive than single vision spectacles.
- Bifocal lenses are useful if the person has a distance refractive error as well as needing a near add. Sometimes people have one pair of single vision spectacles for distance and one pair for near – but it can be inconvenient to change from one pair to the other throughout the day. Bifocal spectacles are more convenient because they can be left on all day.

**Example:** A teacher needs to see both her students and the book she reads from. Her distance refraction is  $-1.00$  D and her add is  $+2.50$  D. She will need to have  $-1.00$  D in the top part of her bifocal lenses, and a total power of  $+1.50$  D in the seg of her bifocal lenses.

- Bifocal spectacles can also be worn by people who have no distance refractive error. In this case, only the seg has focusing power – the top part of the lens has no power (plano).

**Example:** A ticket collector on the train needs to see both the passengers who get on the train, and the tickets that he needs to write. His distance refraction is plano and his add is  $+2.00$  D.

He will need to have no power (plano) in the top part of his bifocal lens, and  $+2.00$  D in the seg of his bifocal lens.

- Trifocal lenses are like bifocal lenses, but instead of having two focusing powers they have three. Trifocals have an intermediate section that is between the distance and near parts of a bifocal lens. The intermediate section can be useful for people who also want to see things that are at an intermediate distance (like a computer screen that is arm’s length away).

## CHOICE OF LENS FOR SPECTACLES (cont.)

<b>PROGRESSIVE LENSES</b>	<p>Progressive lenses are sometimes called “multifocal” or “graduated” lenses.</p> <ul style="list-style-type: none"> <li>• Progressive lenses are more expensive than both single vision and bifocal lenses.</li> <li>• Like a bifocal lens, a progressive lens has power for distance at the top of the lens and power for near at the bottom of the lens – but unlike a bifocal lens a multifocal lens has no lines on it (if you do not check carefully you may think it is a single vision lens!).</li> <li>• A progressive lens also has an intermediate section that is between the distance and the near parts of the lens.</li> <li>• Progressive lenses are useful for people who do not like the appearance of the line on bifocal lenses, and for people who wish to have clear intermediate, distance and near vision.</li> <li>• Progressive lenses must only be fitted by a trained spectacle technician. If the spectacle technician does not fit the lenses very carefully the person will not be able to see properly with their new spectacles.</li> <li>• People who wear progressive spectacles for the first time will usually need some time to adapt to their new spectacles. If the lenses have been fitted in the frame correctly they will usually adapt within 2 weeks. However, some people can never get used to wearing progressive lenses.</li> </ul>
<b>READYMADE SPECTACLES</b>	<ul style="list-style-type: none"> <li>• Custom-made spectacles (like single vision, bifocal or progressive spectacles) can be expensive. Readymade spectacles can be a good alternative for people who cannot afford expensive spectacles.</li> <li>• Readymade spectacles can be prescribed if: <ul style="list-style-type: none"> <li>- both eyes have a similar refractive error</li> <li>- the person has comfortable vision when they wear the readymade spectacles</li> <li>- custom-made spectacles are not available.</li> </ul> </li> <li>• There are no firm rules about when readymade spectacles are appropriate. The best idea is to let the person see the difference between the vision they get with readymade spectacles and the vision they get with their full refraction in the trial frame.</li> </ul>



## TELLING PEOPLE ABOUT THEIR NEW NEAR SPECTACLES

You have written a prescription for the person and the new spectacles are now ready to be given to the person. Before they leave with their new spectacles:

- Make sure the spectacles have been fitted correctly to the person's face.  
Ask the person if the spectacle frame feels comfortable.
- Check the person's vision
  - Single vision spectacles:
    - ask the person to hold a near VA chart at their preferred working distance
    - ask the person if their vision is clear and comfortable
    - show the person that their distance vision is blurred with the spectacles and tell them that this is normal for this type lens
    - tell the person that they need to take their spectacles off if they are walking or if they want to see clearly in the distance.
  - Bifocal and progressive spectacles:
    - ask the person to hold a near VA chart at their preferred working distance
    - tell the person to look at the near VA chart, but not to lower their chin  
(they must lower their eyes to look through the bottom part of the lens)
    - ask the person if their near vision is clear and comfortable
    - ask the person to look at a distance VA chart
    - ask the person if their distance vision is clear and comfortable.
- Tell the person it can take up to 2 weeks for people to get used to their new spectacles
  - especially if they have not worn spectacles previously.
- Tell the person how to look after their new spectacles:
  - show the person how to clean the spectacles
    - wash the spectacles with gentle soap and rinse in cold water
    - wipe them with a soft, clean cloth
  - tell the person not to put their spectacles down on their lenses
  - tell the person to keep their spectacles in a case or a safe place when they are not being used.
- Ask the person to come back and see you if they have any concerns.

## SUMMARY: PRESCRIBING SPECTACLES FOR PRESBYOPIA

### PRESCRIBING SPECTACLES FOR NEAR

#### Case history:

- What the person tells you about their near vision will help you decide what power near spectacles to prescribe.
- Most people who are older than 40 years old need spectacles to see clearly at near – but some do not.
- If the person does not think that they have a near vision problem – do not prescribe near spectacles.

#### Visual needs:

- A person probably does not need near spectacles if:
  - they do not need to see things that are close to them well
  - they can see N8 without spectacles
  - they have a near prescription of less than +1.00 D.
- A person probably needs near spectacles if:
  - they cannot see N8 without spectacles
  - they say that their near vision looks better with your near spectacle prescription.
- You need to consider what type of spectacles would best suit the person's lifestyle:
  - single vision spectacles
  - bifocal spectacles
  - progressive spectacles
  - readymade spectacles.
- Sometimes a person needs more than one pair of spectacles with different types of spectacle lenses.

#### Previous spectacles:

- Ask:
  - how old the previous spectacles are
  - what the vision is like with the previous spectacles
  - whether the person likes the spectacle frame.
- Measure the power of the previous spectacles.
- Let the person compare their vision with their previous spectacles and your near refraction findings.
- The person probably needs their spectacles changed if:
  - they cannot read N8 on the near chart with their previous spectacles
  - there is more than 0.50 D change in their prescription
  - their spectacles are more than 2 years old
  - the person says their vision is worse with their previous spectacles.
- If the person is wearing spectacles for the first time you may need to adjust the prescription.

### THE NEAR ADD AND THE WORKING DISTANCE

#### Preferred working distance:

- Depending on the person's needs you may want to prescribe a weaker or stronger add to move the range of clear vision closer to or further away from the person.

#### Prescribing weaker and stronger adds:

- A weaker add may be necessary if the person wants to use their spectacles to see things that are further away than a normal working distance.
- A stronger add may be necessary if someone wants to see very small objects
  - a stronger add will let the person see clearly at a closer working distance
  - objects that are closer to our eyes appear bigger.
- A high add may be necessary for someone who has low vision
  - a high add will make it easier for the person to read, BUT they will have to use a closer working distance.

## SUMMARY: PRESCRIBING SPECTACLES FOR PRESBYOPIA (cont.)

### CHOICE OF LENS FOR NEAR SPECTACLES

Spectacles for near vision are sometimes called reading spectacles, but they can be used for many other near tasks too.

#### Single vision lenses:

- have just one power
- let a person see clearly at near, but the distance will be blurry.

#### Bifocal lenses:

- have a top part for distance vision and a bottom part ("seg") for near vision
- are more expensive than single vision lenses
- are useful for people who want to see clearly in the distance and at near without removing their spectacles.

#### Progressive lenses:

- also called "multifocal" or "graduated" lenses
- more expensive than bifocal and single vision lenses
- useful for people who do not like the appearance of the bifocal line, and for people who want to have clear intermediate vision too
- require careful fitting of the lenses.

#### Readymade spectacles:

- are much less expensive than custom-made spectacles (single vision, bifocals, progressives)
- can be prescribed if they are suitable and give comfortable vision to the person, and if they are happy with the vision that they get with them.

### TELLING PEOPLE ABOUT THEIR NEW NEAR SPECTACLES

Before the person leaves with their new spectacles:

- make sure the spectacles are properly fitted
- make sure the spectacles give clear vision at near (and distance if appropriate)
- tell the person that it can take up to 2 weeks to adapt to new spectacles
- explain how to look after the new spectacles
- ask the person to come back to you if they have any concerns.

## TEST YOURSELF QUESTIONS

1. Why is the case history important when deciding whether or not to prescribe near spectacles?

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2. Write down two examples where people might need to be prescribed more than one pair of spectacles.

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3. Why should you always let the person compare their previous spectacles and the new near prescription?

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4. Give three examples of where a stronger add might need to be prescribed.

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5. A person who cannot read does not need reading spectacles – true or false? Explain your answer.

☐ True ☐ False (please tick correct answer and explain below)

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6. Complete the following table:

Lens or Spectacle Type	Advantages	Disadvantages
<i>Single Vision</i>		
<i>Bifocals</i>		
<i>Progressives</i>		
<i>Readymades</i>		