



Professionals for Visually Impaired Persons Training XL  
and Knowledge Sharing

**KnowProViP**

**GUIDE DE FORMATION**

Thème:

***Déficiences visuelles et spécificités  
chez la personne âgée***



Guide officiel de formation pour le cours KnowProViP

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**Auteurs :**

*CHENTOUF, R.*, Institut Montéclair, Angers, France

*GREISER, P.*, Berufsförderungswerk, Halle, Allemagne

*LEROUX, G.*, Institut Montéclair, Angers, France

*SCHIMRIK, D.*, Berufsförderungswerk, Halle, Allemagne

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**Partenaires du projet KnowProViP**

**Instituttet for Blinde og Svagsynede**

(Project coordinator)

Rymarksvej 1

DK-2900 Hellerup, Denmark

<http://www.ibos.dk>

**Berufsförderungswerk Düren gGmbH**

Karl-Arnold-Str. 132-134

D52349 Düren, Germany

<http://www.bfw-dueren.de>

**Berufsförderungswerk Halle gGmbH**

Bughagenstraße 30

D06110 Halle/Saale, Germany

<http://www.bfw-halle.de>

**Institut Montéclair**

51, Rue du Vallon

49000 Angers, France

<http://www.monteclair.fr>

**National Council for the blind in Ireland (NCBI)**

PV Doyle House, Whitworth Rd

9 Dublin, Ireland

<http://www.ncbi.ie>

**Royal Visio**

Amersfoortsestraatweg 180

1272 RR Huizen, The Netherlands

<http://www.visio.org>



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## 0 Informations générales pour les intervenants

Cette formation est conçue pour des professionnels travaillant auprès de personnes déficientes visuelles et qui souhaitent mieux connaître la spécificité de la personne âgée.

Les personnes qui sont amenées à travailler avec des personnes très âgées, ressentent souvent le besoin de mieux comprendre le processus de vieillissement, les besoins, potentialités et limites de cette population.

Le protocole qui suit va permettre de vous guider sur le contenu de ces 2 jours de formation.

C'est un recueil d'idées de professionnels de terrain, dans le champ de la basse vision et de la gériatrie, et de sources théoriques.

Il est conçu pour que les intervenants élaborent leur propre contenu en fonction de leurs connaissances et de leurs pratiques professionnelles.

### 0.1 Objectifs de cette formation

- Avoir une idée assez générale du processus de vieillissement normal et pathologique, de la problématique de la personne âgée et de la personne âgée déficiente visuelle.
- Avoir conscience des particularités ou des difficultés que l'on peut rencontrer en travaillant avec elles.
- Connaître les principales stratégies pour faire face à ces difficultés.
- Savoir comment adapter les modalités de rééducation.

### 0.2 Présentation du groupe et des intervenants

- Tour de table.
- Présentation de la formation dans son ensemble ou du module en particulier et de ses objectifs.
- Le protocole de formation peut suivre les éléments déclinés dans les pages suivantes.

# 1 Particularités de la personne âgée et discussion

Intervenant : Gériatre

## 1.1 Objectifs de ce module

A travers les expériences et connaissances des participants, comprendre ce qui fait la particularité et la spécificité de la rencontre et du travail auprès d'une personne âgée ou très âgée.

Aider les participants à identifier les problématiques de la personne âgée :

- Santé physique et mentale
- Vie sociale
- Environnement familial et social

Connaitre les indicateurs et outils de mesure de la dépendance et/ou du vieillissement (ce qui peut être très spécifique à chaque pays et permettre l'attribution éventuelle d'aides financières). Les outils de mesure de la dépendance, les indicateurs de vieillissement, les méthodes d'évaluation, pourront être étudiés dans ce chapitre.

## 1.2 Support de cours, matériel

1. Vidéos
2. Entretiens
3. Photos
4. Cas cliniques, exemples
5. Démonstration des outils d'évaluation et de mesure

## 1.3 Contenu

- Echanges d'expériences entre participants, en groupes de travail, ou par brainstorming, débats et discussions.
- Démonstrations et explications des outils de mesure du vieillissement ou de la dépendance s'ils existent (grille AGGIR en France par exemple), explications des différents niveaux....
- Visionner une vidéo d'entretiens réalisés avec des personnes âgées et/ou des personnes âgées mal voyantes serait intéressant à mettre en place pour ouvrir la discussion.

## 2 Processus de vieillissement

Intervenant : Gériatre

### 2.1 Objectifs de ce module

- Pouvoir différencier le processus de vieillissement physiologique et normal, du pathologique
- Connaître les différentes modalités du vieillissement.

### 2.2 Support de cours, matériel

Diaporama, présentation power point

### 2.3 Contenu

- Le vieillissement normal, les données bio – médicales sous-tendant le processus de vieillissement : modifications des cellules, des organes, durée de vie génétique, facteurs environnementaux...
- Le vieillissement pathologique : Alzheimer, Parkinson, dépression, accident vasculaire cérébral, hypertension artérielle, diabète, arthrose, ostéoporose, poly - pathologie comme accélérateur du vieillissement...
- Spécificités psychologiques chez la personne âgée : à quel âge se sent-on vieux ? Savoir rebondir même après un choc, une perte, un deuil...Conséquences psychologiques de la mal voyance chez la personne âgée et très âgée.
- Vieillesse neurosensorielle : les personnes âgées sont très souvent affectées de baisses visuelle et auditive sévères, ce qui les fragilise et perturbe leur qualité de vie. Les déficiences visuelles et auditives accentuent le risque de dépendance dans les activités de la vie quotidienne, dans les déplacements, dans la communication avec autrui avec un risque accru d'isolement.
- Vieillesse sociale : comprendre que vieillir n'est pas seulement une question d'âge et que les aspects psychosociaux jouent aussi un grand rôle : l'environnement, les capacités d'adaptations, de faire face aux épreuves...

Les poly-pathologies chez la personne âgée réclament un parcours de soins spécifique : informations sur le parcours de soins, les stratégies de soins, ou comment hiérarchiser les besoins, comment développer des parcours de prise en charge avec des personnes qui souffrent de poly-pathologies. Cette hiérarchie du soin est très importante au très grand âge puisqu'on va privilégier la qualité de vie.

Intérêt du travail en réseau avec les acteurs de la gériatrie mais aussi ceux du handicap visuel et auditif pour un apport mutuel. Sur le champ de la communication avec des personnes très âgées, il y a matière à collaborer.

## 3 Personnes âgées et environnement

Intervenant : Gériatre

### 3.1 Objectifs de ce module

- S'attarder sur l'importance de tenir compte de l'environnement familial, social de la personne âgée.
- Comprendre en quoi nos actions rentrent dans le domaine de la prévention face à la dépendance.

### 3.2 Support de cours, matériel

- Exemples de cas pratiques
- Support vidéo

Si besoin, selon le groupe et les desiderata, faire des simulations du double handicap si spécifique de la personne âgée : prévoir lunettes de simulation et bouchons d'oreilles.

### 3.3 Contenu

Les conséquences de la mal vision quand on est âgé dans les domaines suivants :

- les déplacements
- Les loisirs
- La lecture
- Les activités de la vie quotidienne
- Le risque de chute
- La communication sachant que les problèmes auditifs s'ajoutent souvent...

#### Notions de prévention

Faire reculer le plus possible le moment de la dépendance.

L'approche rééducative rentre dans le domaine de la prévention, en particulier quand on agit sur les lieux de vie.

Les différents milieux de vie possibles de la personne âgée : le maintien à domicile, le foyer logement, la maison de retraite, le placement en institution...

Nécessité de coordonner les actions des différents intervenants, services qui gravitent autour de la personne âgée et de son environnement social et familial.

### Fin de la première journée

Discussion et évaluation

Connaitre les impressions et critiques des stagiaires sur cette première journée.

## Deuxième journée

Cela commence par une présentation du contenu de cette deuxième journée de formation, et par les éventuelles questions relatives à la journée précédente.

### 4 Expériences et Adaptations de travail avec des personnes âgées

Intervenants : Professionnels de la déficience visuelle  
Orthoptiste, AVJiste, Instructeur en locomotion, Psychologue, Formateur aides techniques...

#### 4.1 Objectifs de ce module

- Echanger les expériences entre le groupe de stagiaires et les formateurs.
- Comprendre les attitudes et comportements, les difficultés, liées à la malvoyance, et plus particulières à la personne âgée.
- Trouver des idées de solutions pour pallier aux difficultés des personnes âgées déficientes visuelles.
- Conclusion : trouver les adaptations spécifiques quand on travaille avec des personnes âgées déficientes visuelles.

#### 4.2 Support de cours, matériel

- Diaporama, présentation power point
- Bandeaux et lunettes de simulation
- Petit équipement de la vie quotidienne (sets de tables colorés, assiettes, verres, livres et revues, journaux etc.)

#### 4.3 Contenu

- Discussion avec le groupe de participants à propos de leurs expériences de travail avec des personnes âgées, si tel est le cas, et comment/si ils arrivent à repérer les éventuels problèmes visuels.
- Comprendre le vieillissement physiologique de l'œil.
- Parler des indicateurs de basse vision comme ci dessous :

Indicateurs
Prescription médicale par un spécialiste basse vision
Utilise des aides techniques comme loupes, filtres, canne...
Se plaint de problèmes visuels
Se plaint de la lumière (pas assez, ou trop), besoin de lampes, éteint la lumière, baisse les stores...
Ne reconnaît pas les gens
Se cogne dans les obstacles, trébuche, chute

<b>Indicateurs</b>
Se désoriente, se met en danger par rapport aux véhicules
N'est pas en confiance dans ses déplacements avec un accompagnateur
Refuse de sortir
Ne fait plus de courses
A des maladresses à table
Refuse certains plats (viande avec os, poissons...)
N'a pas conscience de son apparence physique (association de vêtements de couleurs, tâches, coiffure...)
Ne fait plus certains actes de la vie quotidienne (téléphoner, lire, écrire, jouer aux cartes, payer)
Est en difficulté pour retrouver ses affaires
N'a plus les moyens de savoir quelle heure il est
Ne parvient pas à contrôler l'état de propreté de la maison
S'isole

- Discuter comment repérer les éventuelles difficultés visuelles, comment trouver les bonnes questions, par exemple :

Vision de près :

- + Quand avez-vous lu le journal la dernière fois ?
- + Avez-vous des difficultés pour vérifier le ticket de caisse ?

Capacités de repérage :

- + Avez-vous des difficultés pour savoir ce qu'il y a dans votre assiette ?

Vision de loin :

- + Avez-vous des difficultés pour reconnaître les visages ?
- + Pouvez-vous reconnaître quelqu'un à l'autre bout de la pièce ?
- + Est-ce que vous pouvez repérer les escaliers ?

- Les différents professionnels relatent et expliquent comment ils ont adapté leurs modes d'intervention avec des personnes âgées déficientes visuelles
- En pratique : adaptations dans le quotidien quand on voit très mal et qu'on est âgé : aménagements possibles pour préparer et servir le repas, pour les déplacements d'un lieu à l'autre, pour les loisirs et la détente (mots croisés, lecture...).

## 5 Lumière, environnement et accessibilité

Intervenant : professionnel de la déficience visuelle

### 5.1 Objectifs de ce module

- Connaître l'influence de la lumière sur la vision, tout spécialement pour les personnes âgées, et savoir comment adapter la lumière et l'environnement en conséquence.
- Comprendre comment un bon environnement lumineux augmente la sécurité de la personne et son indépendance.
- Connaître les différents types d'équipement lumineux et les normes d'éclairage.
- Comprendre comment on peut adapter un environnement aux contraintes visuelles de la personne.

### 5.2 Support de cours, matériel

- Diaporama, présentation power point
- Films et vidéos
- Salle de lumière

### 5.3 Contenu

- L'intervenant présente les différents aspects de la lumière:
  - ▶ Qu'est ce que la lumière : éclairement, luminance, flux, intensité, couleurs de lumière, mode d'éclairage
  - ▶ La lumière et la basse vision : un éclairement suffisant et non éblouissant, une recherche d'uniformité dans l'éclairage...
- Expérience pratique dans une "salle lumière" : différentes ambiances lumineuses pour différentes activités (lecture de livres, mots croisés, lecture du journal...)
- Exemples d'adaptations de différents environnements : lieux publics, lieux de travail, domicile (photos, vidéos)
- Discussion : expériences des participants, projets de travailler sur cet aspect dans l'environnement des personnes âgées.

## 6 Informatique et nouvelles technologies

Intervenant : Formateur aides techniques expérimenté dans le domaine de la déficience visuelle (accessibilité et adaptations)

### 6.1 Objectifs de ce module

- Comprendre comment les technologies informatiques peuvent faciliter l'autonomie et limiter l'isolement des personnes âgées
- Comprendre quelles adaptations et outils peuvent aider les personnes âgées déficientes visuelles à utiliser de façon autonome un ordinateur
- Connaître les outils communs de communication et leurs adaptations (téléphones fixes, portables, télévision...) pour les personnes âgées (déficiences visuelles et auditives).

### 6.2 Support de cours, matériel

- Ordinateurs équipés de :
  - + logiciels d'agrandissement
  - + logiciels de revue d'écran
  - + Plage tactile
- Accès à Internet
- Aides techniques (téléphones, télécommandes etc.)

### 6.3 Contenu

- Introduction par l'intervenant et présentation des différentes aides techniques
- Expérience pratique en utilisant un ordinateur :
  - + Paramétrages de Windows (taille de police, contraste, couleur, écran, loupe...)
  - + Logiciel d'agrandissement et de revue d'écran (Zoom Text, Lunar, Magic, Jaws... )
- Information et présentation pratique d'aides techniques adaptés aux personnes âgées (mal - voyantes et/ou mal - entendants)

## Fin de la seconde journée

Discussion et évaluation

Connaitre les impressions et critiques des stagiaires sur cette deuxième journée

Questionnaire d'évaluation.

Discussion avec le groupe sur ce qu'ils ont appris durant ces deux jours, ce que ça peut changer dans leur quotidien professionnel...

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## Annexe 1

## Programme

<b>Première journée</b>			
Sujet	Contenu	Intervenants	Durée
Introduction	Présentation du groupe et de l'intervenant		0,5 h
1 Particularités de la personne âgée. Discussion	- Partir de la pratique et des expériences des participants pour échanger sur la personne âgée en général. - Identifier les problématiques de la personne âgée : santé physique et mentale, vie sociale, environnement familial et social... - Les outils de mesure du vieillissement et de la dépendance	Gériatre	1,5 h
2 Processus de vieillissement	- Vieillesse physiologique et normal - Vieillesse pathologique - Aspects psychologique du vieillissement... - Le double handicap auditif et visuel quand on vieillit - Aspects sociologique du vieillissement..	Gériatre	2 h
3 Personnes âgées et environnement	- Les conséquences de la mal vision, quand on est âgé : dans les déplacements, les loisirs, la lecture.... en lien avec les problèmes auditifs, souvent associés, et les risques de chute... - Les modes de prévention de la dépendance - La coordination des soins	Gériatre	1,5 h
Bilan	Commentaires et discussions sur cette première journée	Gériatre	0,5 h

<b>Deuxième journée</b>			
Sujet	Contenu	Intervenants	Durée
4 Expériences et adaptations de travail avec des personnes âgées	- Comment repérer les difficultés en lien avec des problèmes visuels chez les personnes âgées. Influence de l'âge sur la vision. Discussion sur les expériences du groupe. - Les différents professionnels relatent et expliquent comment ils ont adapté leurs modes d'intervention avec des personnes âgées déficientes visuelles : outils, méthodes, environnement dont il faut tenir compte...	Rééducateurs ou professionnels de la déficience visuelle : orthoptiste, AVJiste, Instructeur locomotion, psychologue	2,5 h
5 Lumière, environnement lumineux et accessibilité	- Comprendre comment les conditions lumineuses influencent la vision en particulier chez les personnes âgées - Comment adapter l'environnement lumineux à la personne âgée ?	Spécialiste de la lumière et de la déficience visuelle	2 h
6 Informatique et nouvelles technologies	- Aides techniques et conseils pour utiliser un ordinateur et Internet avec une vision faible, en lien avec les intérêts et problématiques des personnes âgées.	Formateur aides techniques	1 h
Bilan et évaluation	Discussion à propos de tout ce qui a été appris pendant ces 2 jours	Formateur	0,5 h

## **Annexe 2** **Publication sur le sujet**

(avec l'accord des auteurs)

### **VISUALLY IMPAIRED ELDERLY**

T.J.M. Blom, PhD & C. Diepeveen, MSc

#### **Introduction**

A chapter examining visually impaired elderly suggests a difference between low vision at younger age and low vision in the elderly. However, with regard to the technique of visual aids no differences exist. The way to find out which visual aids are most suitable is the same for both groups. From a technical point of view this chapter could be disregarded. Focussed on the age distribution of the population requiring visual aids, the old to very old aged population is represented abundantly. In a country like The Netherlands visual impairment is often an age related problem. Over two thirds who request visual-aid advice are older than 65 years. Moreover, the elderly will be a relative larger group of the population in the future, especially people over 80 years-old. From 1990 till 2005 an increase of 39% was expected. In these age categories especially, severe eye diseases occur considerably more often than in the younger population. Concerning the prevalence of eye diseases in the elderly a dynamic cumulative impact occurs. Several estimations have been made about population prognoses, table 1 shows the middle variant (CBS, 1993). People aged above 45 and above 65 will represent a relative large group of our community. The ages 45 and 65 are not chosen randomly, an increased risk of several eye diseases exists. Particular eye diseases as ocular hypertension, glaucoma and diabetic retinopathy occur more often above the age of 45. Estimated increases from 1990 to 2005 are respectively 30%, 28% and 45%. Cataracts and macula-degeneration occur more often above the age of 65, estimated increases from 1990 till 2005 are both 26% (CBS, 1995).

Furthermore to define the elderly as a single group is not appropriate. The elderly do not have concrete corresponding group characteristics as other age groups have, like children, youngsters or adolescents. Concerning child-research it can be advantageous to compare same age groups on their behaviour and possibilities, like in educational research. This is not applicable in research in elderly because more differences than similarities exist between elderly. Some elderly of 90 years old are very independent and actively involved in their environment and some elderly of 60 years old are complete dependant on intensive care. Despite the differences among the elderly, issues concerning the elderly should be considered. There actually are very active people of 90 years-old, but the chance of being needy at ninety years old is greater than at sixty years old. For this reason, statements about the elderly can only be made in statistical terms and no hard conclusions can be made on an individual base. The only strict criterion is that the elderly are older than younger people. It appears futile but it is often the criteria one is judged upon. Subsequently, the elderly are generally no longer involved in economic society. Furthermore, in the elderly the process called ageing is more progressive than in younger people. The ageing process does not always occur in the same way or at the same pace.

#### **Identity and balance**



Everyone has a certain identity and everyone tries to maintain that identity, despite any kind or amount of ageing. Any help damaging the identity will not be appreciated. Besides the identity people also try to maintain certain balance in their life. That balance will not persist automatically.

Identity or self image is the idea or image one has about oneself. It is the combination of personality characteristics and behaviour styles which are experienced by one.

### ***Identity characteristics***

- A) Our personality is experienced as a constant: we know we change permanently during our life. A child's perception is totally different from an adult's one, like a student's perception differs from a parent's one, and an elderly perception differs from a middle-aged one. Nonetheless, we feel that we constantly remain the same person. We keep acting the same although situations differ all the time. Despite changes, permanency is a feature of identity.
- B) We experience ourselves as unique. It's difficult to exemplify the uniqueness of the personality to someone else. Everyone feels his or her own identical identity, which is totally different from others and which is fundamental to his or her behaviour and relationship to others.

It can be concluded that the notion of identity is diffuse. Therefore, it is meaningful to discuss a few parameters or components which shape the notion of identity. It is possible to describe many self images with limited different fundamental components. One person uses many typical X-components to form his or her identity (for example financial profit), while others wish many typical Y-components (many education for example). Important is that everyone has an identical and unique pattern of components which in mutual ways create an absolute individual identity. Tempelman (1986) lists eleven components:

1. Physicality
2. Personality
3. Gender
4. Personal history
5. Values and standards
6. Ideals
7. Activities
8. Participation, membership of a group
9. Knowledge, skills and level of education
10. Interests
11. Material property

### **Unstable balance**

In every phase of their life many influences affect people. Those influences can make it difficult to maintain a balanced state. Depending on the individual, the amount and intensity of influences can be valued differently. Based on the balance of an individual Tempelman (1986) formulated the model of unstable balance. The model of unstable balance tries to view systematic at forces which can disturb or stabilise the balance. Following three parameters determine the stability of the balance:

1. Physical state
2. Mental state
3. Social state

These three parameters are in balance with each other. The term unstable balance refers to the fact that balance is not stable and changes when one of the parameters changes. So the parameters are not independent. Changes in one parameter can effect changes in the other. For example, social problems, like conflicts with family members or stress, can cause physical problems such as stomach ulcers. In addition, social problems such as loneliness can be a cause of mental problems like fears or phobias. One of the features of getting older is that the interdependence of the parameters increases. In contrast with younger people, influenza can have disastrous consequences in the elderly. In some situations a relatively small change in one parameter can cause a large change in the other. Complete loss of balance is the consequence (decompensate).

### **Ageing**

In conclusion, people have an identity and their balance is maintained by their physical health, mental health and social capabilities. Both processes are influenced by ageing. Last statement can actually not be made as long as it is not clear what the definition is of ageing. Ageing and getting older are not identical. Ageing means that a complex of irreversible processes take place in the organism during life after maturity.

Still it is a complicated gerontologic issue whether physical changes can be attributed to ageing or not. Therefore age-related changes have to meet the following four criteria before it can be considered part of the basic ageing process. Age-related changes are:

- A) Universal. This rules out hereditary changes and environmentally induced changes.
- B) Intrinsic. It must be attributable to changes inside the organism.
- C) Progressive. Age-related changes generally occur gradually over time. During development processes occasionally slow down over time and stop at the time of maturity.
- D) Deleterious. Most age-related changes contribute to the increased probability of death. This criterion eliminates many developmental processes, because those age-related changes are not deleterious and do actually improve survival capacity.

### **Physical ageing**

Ageing is as well a physical process as a mental process. Physical ageing is a loss of function of all organs. The more complex the (system of the) organ, the sooner loss of function will happen. Physical ageing can be caused by extrinsic factors, like quality and composition of nutrition. People who eat poor and limited food age more quickly than people who eat high-quality and diverse food. Climate is also an influential factor as ageing processes go slower in temperate areas than in extreme cold or hot areas. In addition, it is assumed that air pollution and other kind of environment pollution also contribute to ageing. The longer ageing occurs, the more susceptible people are to extrinsic factors, for example an increase of infections. Also intrinsic factors, like cell loss, exhaustion of essential elements (elasticity) and molecular changes can cause ageing. Intrinsic factors can also affect health by a speeding up ageing process, just like metabolic disorders (as diabetes or thyroid diseases) can lead more quickly to mental confusion, dementia and psychiatric disorders in the elderly.

Most prominent physical features of ageing are:

- 1) Integument: less elastic, drier and pigmentation spots.
- 2) Skeletal system: osteoporosis, decrease in length.
- 3) Muscular system: decrease in muscle mass, partly replaced by fat.
- 4) Circulatory system: arteriosclerosis (thickening and hardening of the arterial walls, thrombosis and cerebral infarcts).
- 5) Respiratory system: decrease in vital capacity (total amount of air that can be moved in and out of the lungs). Obesity, decreased elasticity, and changes within the blood vessels and skeletal system may contribute to this.
- 6) Nervous system: one year after birth the amount of nervous cells does not increase anymore. Research indicates a loss of weight of the brain of 6-7% between the age of 25 and 75. An important measurable neurological change is a reduction of nerve conduction velocity (10%).
- 7) Sensory system: changes in the visual, auditory, tactile and olfactory system.

### **Ageing of the eyes**

Visual impairment is one of the fundamental ageing processes. As one ages, several degenerative changes can be observed in the structure and, therefore, the function of the eye.

#### *Cornea*

The cornea tends to flatten and often the corneal epithelium degenerates. Both changes can impair vision, the former through astigmatism and the latter through severe discomfort. (...)

#### *Sclera*

The sclera becomes less elastic with age and turns more yellow because of the accumulation of fat. A decreasing elasticity during the ageing process is also found in several other tissues.



### *Iris*

Similar to other tissues, the iris thickens and becomes more rigid with age. This resolves in reduced dilatation and a smaller opening of the pupil. (Atropine induces pupil dilatation artificially.)

### *Anterior chamber*

Due to the thickening and sclerosis of the trabecular meshwork in the angle of the eye's anterior chamber, there can be some obstruction in the canal of Schlemm, which drains aqueous fluid from the eye. Fortunately, a concomitant decrease in the production of aqueous fluid seems to take place, so that intraocular pressure is not normally elevated.

### *The lens*

The lens of the eye continues to grow with age and enlarges, becomes stiffer, and tends to turn yellow. The result is a decreased accommodation and an increased opacity of the lens. The yellowing also results in a decreased colour perception of blue colours (Pokorny et al., 1979) and opacities lead to cataract and loss of contrast sensitivity.

### *Choroidea*

Hyaline or colloid bodies develop in the layer of blood vessels known as the choroids and show up as rounded, yellow spots in the retina (Feeney-Burns et al., 1990).

### *Retina*

As a combined result of the ageing processes in the lens and iris, less light reaches the photoreceptor cells of the retina, especially in the peripheral field and in the macula (reduces visual acuteness).

### *Vitreous humour*

In later years, the body loses hydration and sometimes detaches from its connections to the retina, a situation which can eventually lead to a more serious retinal detachment from the choroids. An additional complication can be haemorrhaging of retinal blood vessels into the vitreous. Another common occurrence with vitreal degeneration is the appearance of opacities in the vitreous that take the form of dots, lines, or cobwebs and are referred to as "*mouches volante*" or "floaters". Although annoying to the individual, the presence of "*mouches volante*" ("floaters") are normal and not a serious health concern.

### *Combined result*

The combined result of age-related changes in the iris, retina and media is that less light gets to the photoreceptor cells of the retina. Therefore, older people tend to need more intense light to see as well as they once did.

### *Adnexa*

Dry eye is another age-related complication associated with the lacrimal apparatus. Dry eye is a condition resulting from a decrease in the secretion of tears from the lacrimal glands and is seen more often in elderly women than in elderly men. The result can be discomfort and possible inflammation. The usual treatment, hourly

administration of artificial tears, is not always a satisfactory solution to the condition.

### ***Mental ageing***

In addition to physical ageing mental ageing also occurs. Several relevant parameters of mental ageing are:

1. Evaluating the balance of life for the second time. First evaluation happens around middle age and chosen lifestyle will persist until it becomes dysfunctional, around the age of 65.
2. Change of life perspective. Functioning is effected by experiences in the past. Long-term thinking decreases and the notion of future perspective gets another meaning.
3. Maintain the identity. More energy is necessary to maintain the identity, because of all physical, mental and social threats.
4. Personality. A lot of research has been done on gerontology and it can be concluded that differences between individuals increase with age. There are more differences within age groups than between age groups. Human beings are unique, but older people appear to be even more unique. Overall life situation, including biographical and social elements, seems to be more crucial on personality characteristics than physical age is. Research suggests an integrated personality develops until the age of 50 or 60. The elderly tend to avoid risks and, although indications also point out a certain declining flexibility, this tendency is not equal to rigidity. In problematic situations they prefer known solutions, even if they are inactive.
5. Intelligence doesn't increase or decline with age, but changes. In particular, the speed related parts of intelligence are affected by nervous system changes. Verbal intelligence remains unchanged or even increases with age. Intelligence at an older age depends on the following factors: original intelligence, education, stimulating (work) environment, health (less healthy people score lower on all parts of intelligence) and a positive attitude toward the future.
6. Ageing includes a decrease of memory and the ability to learn. Problematic ageing, which can be caused by loneliness, partner loss or depression, is associated with an increase in mental confusion. There are a significant number of single elderly with feelings of loneliness and insecurity, and elderly with mourning, loss and depressive problems. Related confusion is marked by:



- Tempo loss: slower formulations, apathy and loss of initiative.
- Difficult imprinting: talk a lot about the past and rely on old solution strategies, which can be wise as well as rigid.
- Emotional instability: a diminishing *perception*, depressive features increase suicide chances.

### ***Ageing of the visual function***

Age-related sensory and perceptual changes can greatly influence daily functioning. Keep up a common lifestyle and maintaining balance can be very difficult, and ageing processes may influence these. Following ocular functions change with increased age and lead to visual impairment:

#### *Visual acuity*

It is presumed visual acuity declines gradually in a linear way between the age of 30 and 80. A famous longitudinal research at Fozzard (University of Baltimore, USA) tested a randomized population and demonstrated an average visual acuity of 1.4 at 25-year old people. Most people older than 80 have a visual acuity just above 0.5 and 12 % have a visual acuity of 0.4 or less. As a result of decreased visual acuity, road signs and instructions, for example, have to be closer in order to be read. Same counts for rephrase accommodation, but most reduction occur between the age of 45 and 70.

#### *Contrast sensitivity*

Visual acuity is investigated with the help of *low vision charts*. These charts measure someone's ability to distinguish between subtle details in a situation with optimal lightning and maximum contrast. Such a situation hardly ever occurs in daily life because the contrast of lightning is much lower then. The contrast sensitivity value is the required brightness difference between the object and its background to recognize an object. That difference grows with age. Studies have shown that, with low contrast photos, the elderly have more difficulties with recognizing faces. Significantly more time was needed before recognizing. Marron and Bailey (1982) demonstrated that deteriorated mobility, caused by visual impairment, more often is a result of low contrast sensitivity or a small vision field, than low visual acuity. When someone can not judge the depth of steps anymore, for example, it is more often a result of contrast sensitivity than of low visual acuity.

#### *Luminance*

As mentioned before, a result of changes in the media and iris is that less light reaches the retina.

This can partially be compensated by increasing the illumination in the environment or using light separately. Even with a common visual acuity, a typical sixty-year-old person requires approximately twice as much illumination as does a twenty-year-old. A typical eighty-year-old even needs approximately three or four times as much. During counselling, sometimes an optometrist prescribes visual aids in a different lighting situation as the home environment. Subsequently the visual aids may not have the right effect. Hence, it is important to take into account the lighting of the home environment.

Practical consequences of age-related changes in visual acuity, contrast sensitivity and luminance become clear when drivers were asked to read road

signs at night. The 60-and-over-age group required 75% less distance to read a road sign than people around the age of 25.

### *Colour vision*

Research has consistently reported, as a result of a yellowing lens or retina affections (as glaucoma), a differential loss of discrimination for the colours of short wavelengths, such as green, blue, and violet. Colours with longer wavelengths, such as red, orange and yellow, may seem less faded (Pokorny et al., 1979).

### *Depth vision*

Another important aspect of human vision is depth perception. The localization of objects in the visual field can be made using different cues of relative object size, overlay of near or far objects, light, shadows, and differences in colour and texture. Interpreting and integrating different visual stimulants is usually an unconscious process and provides a lot of information about the person related to his environment. To move from one point to the other this is essential. A loss of depth vision can have negative consequences to mobility, especially at elderly, when falling can lead to severe complications. Instead of age, it is reliable that impaired depth vision is a function of the parameter reduction mentioned above.

Physiological changes have functional consequences. A few will be exemplified below.

### *Perception*

One of the most obvious aspects of reduced visual perception is the reduced reading speed, usually noticeable when reading subtitles. Elderly frequently complain that, as a result of reading difficulties, there is no time left to see the images. Also changes in the other sense organs contribute to vision difficulties, like hearing, smell, taste and touch (reduced smell, taste and hearing of high and low). The individual can become isolated because of sense reduction, and that may lead to complex psychological reactions as depression, apathy and loneliness.

Another aspect is more difficulties with accomplishing complex visual functions. Complex visual functions include organizing, processing and interpreting of visual information. Visual searching problems derive from ageing. More time is needed to scan the environment and filter relevant information (as searching a grandchild on a group photo). Elderly are presumed to have more problems with ignoring irrelevant stimuli.

Different studies demonstrate significant changes in visual perception of more complex patterns at ageing (Ordy & Brizzee, 1979). Visual perception does not only refer to recognizing complex patterns, but also to visual memory and visual learning. However, how ageing is related to brain changes, personality changes or psychosocial changes is unclear.

## **Prevalence of visual impairment and blindness**

In the Netherlands extensive research has been carried out examining physical disabilities using a sample of 55,000 of all ages. (CBS and Nimawo, 1990). Respondents were asked to fill in a questionnaire about bodily functions and arrange them according to importance. 86% of the participants rated visual faculty as most important. The research also indicated that over 30% of the participants lacked something physically. These participants were then questioned orally to evaluate whether they met the criteria of disability. Different questions determined also how serious the disability was. Regarding visual impairment, people could choice the following statements:



- a. I only can distinguish light from dark.
- b. I cannot read large headlines or distinguish illustrations.
- c. I cannot read usual headlines (10 pts. letters).
- d. I cannot recognize someone's face on the other side of the room.
- e. I have (some) difficulties with seeing.
- f. I do not have difficulties with seeing.

When a or b was chosen, the researchers called the visual impairments 'extremely severe', c or d was called 'severe', e 'light' and f 'no impairment'.

Table 2 shows that, extrapolated to the total population, 625,000 people lack something visually. Even 0.4% of the population (59,000 persons) assessed their visual impairment as extremely severe. Furthermore, table 3 shows an age dependency: older people report more problems.

Besides visual defects, the research also focussed on walking impairments, hearing impairments and overall fitness. Table 3 also shows that impairments increase with age. Combinations of physical and visual impairments are shown in table 3b. Within the categories 'severe' and 'extremely severe' visual impairment (estimated at 158,000 persons), 56.9% reported at least one additional impairment. The research suggests that a substantial percentage of people who visit the optometrist for visual impairment also have other physical impairments, which is important with counselling. It appears that in approximately 18% of cases, the advice given is inadequate, like using the ears more than before through taped books.

Remarkable in the CBS- and Nimawo-research is the almost consequent gender difference. At every age women show more often impairments than men. However, the higher the age, the smaller that difference. In the age category 'older than 85' men even score higher than women.

### ***Elderly in need of help***

The research mentioned above was based on a random population. A different research (Hoogmoed et al., 1990) was typically focussed on elderly in need of help. On a geriatric department in a general hospital (GAAZ) 99 elderly were tested on the prevalence of visual disorders. Hospitalized participants entered the hospital because of other diagnosis than visual impairment, which makes the research representative for elderly on a GAAZ with co morbidity. Also patients with light to moderate memory disturbances were included. 64 Participants did not report visual complains, 30 participants did and 5 participants reported an unclear answer. 73% of the group who reported 'no visual disturbances' (47 persons) had a normal vision. Remaining 27% is noticeable visually impaired. The participants who did report visual disturbances (30 persons), 67% of them was diagnosed with an evident handicap and 33% was not.

Hoogmoed correctly concludes that the questionnaire is not a reliable method to discover visual impairments. It is remarkable that little to no relation exists between visual impairment and problems with daily activities and mobility.

An odd phenomenon with of age diseases and disorders is the difference between the professional's diagnosis and the individual bodily experience. The amount of professional diagnosis shows little correlation with the subjective well being. Recent research shows that approximately 50% of people above 65 evaluate their health as 'well'. Among those who report health problems, just retired men and women feel less well than the elderly above 80 years old. Just retired men



feel less well and the eldest men most well. So, elderly above 80 years old evaluate their health more positively than younger elderly. A clear positive correlation exists between objective diagnosed diseases and age. People above 80 years old have significantly more diseases than people around 65 years old. A clear (second) correlation was found between bad physical health, bad mental health and reduced social networks. In other words, lonely elderly report worse mental health and have significantly more diseases than elderly who have social contacts on a daily basis.

### **Prevalence of visual impairment and blindness in the Dutch elderly**

As shown by the study of Hoogmoed et al., a difference between objective impairments and subjective limitations accounts especially in the elderly. Hence, questionnaires focused on the opinion of the (elder) participant indicate subjective experience instead of an objective diagnoses.

An extensive study has been done in Rotterdam among the population above 55 years. They attempted to abolish the methodological complications of self report as mentioned above. In all 7.983 participants were questioned about possible vision problems and 6.775 of them were extensively ophthalmological examined. The ophthalmological examination includes refraction, *visusbepaling*, *oogdrukmeting*, *spleetlamponderzoek*, *fundusscopie*, *fundusfotografie* and eye-range research. With this, the research is the only elaborated study in the Netherlands which collects both subjective self report data and objective ophthalmologic data. The study no longer defined visual impairment and blindness by subjective data, but the principle is the objective ophthalmologic data. The latter are tested on the WHO-criteria of visual impairment and blindness. Mentionable is the Working group on the prevention of blindness, who invented the WHO-criteria, mainly includes ophthalmologists. It is thought that the criteria are too strict because some people who are not able to engage in certain activities because of visual impairment do not meet the criteria. Because of this criticism and in comparison with other studies the authors use the US-criteria of visual impairment and blindness. A visual acuity between 0.5 and 0.1 on best eye means visual impairment and a visual acuity below 0.1 on best eye means blindness.

As shown in table 5, according the WHO-criteria, 1.9% of the participants in the Rotterdam study is visually impaired or blind, and according to the US-criteria 4.3% is. It is interesting to combine these results with Klaver et al.'s research (1998) and the population prognoses of 1993 (CBS), and to calculate the extrapolated amount of visual impaired and blind Dutch elderly. An additional complication is that the middle variant of the prognoses only includes people older than 65 years old. In 2000 this is 13.8% of the population (over 2.2 million). When leaving the youngest category of Klaver et al.'s study out of consideration, an estimation of people above the age of 65 can be made. Dependent on the (WHO-

or US-) criteria, between 2.2% and 5.9% is visually impaired and between 0.7% and 1.1% is blind. In all, this means that between 64,000 and 154,000 people above 65 are visually impaired or blind, which does not differ a lot from the estimation of the CBS- and Nimawo research (158,000 of the population). Klaver et al. mention their estimation has a somewhat low prevalence because of their population, and because people who did not respond appear to be relatively more often visually impaired than people who did respond.

In the Rotterdam study, a gender difference in prevalence is also examined. Different to the CBS- and Nimawo research, no significant gender difference of

visual impairment has been found in this study. Above the age of 55, women and men are equally visually impaired.

### **Causes of visual impairment and blindness in the elderly**

Table 6 shows that cataract is the main cause of visual impairment in elderly, like former research also indicated. Generally, it is believed that cataract is not a main cause of visual impairment anymore because of the current availability of good therapy. Klaver et al. concluded that more people with cataracts than presumed do not visit an eye-doctor. A more active ophthalmological policy may prevent visual impairment by cataracts. Focussed on the causes of visual impairment of people who visit a low-vision practice, many people with cataracts will not consult because of visual aids.

Second distinct issue is that diabetic retinopathy is less often a cause of visual impairment than it was thought. The authors emphasize diabetes mellitus does appear often, but it is not an important cause of visual impairment.

### **Conclusion**

Adaptation of visual impairment is very diverse in the elderly and the intensity of visual deterioration varies per individual. That is why it is not only important to know the intensity of visual deterioration, but also to focus on the effects of visual deterioration on daily functioning (Rumney et al., 1994). The process of managing the deterioration and seeking to master the conflicts of daily functioning is referred to as coping.

Disorders as reduced *scherp zien* (*contrast sensitivity?*), reduced colour vision and reduced depth vision do not necessarily lead to enormous limitations, but from a psychological point of view they do can have radical social consequences. Often certain adaptation occurs spontaneous when deterioration is noticed. When adjustment appears to be insufficient, low-vision visual aids, coping skills and environmental adaptation can maintain an acceptable balance for a long time, promoting independent functioning. Verstraten (1993, 1994) notices correctly that it is important that eye care specialists and service providers inform the elderly about possible visual assistance and aids, and motivate them to use the low vision devices. After all, only when knowing the possibilities, good decisions can be made.

Great variance exists among the elderly concerning plasticity, social expectations and desires about daily tasks. Therefore, professional attention does not only need to focus on measuring visual abilities and suggesting visual aids, but especially focus on lifestyle, interests and personal goals of the elderly person. For example, focus on the activities of the individual that he or she would like to, and is able to, manage.

The assumption that reduction in visual abilities always leads to the same limitation in activities is not true, especially for the elderly.

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**Tables**

Year	1990	1995	2000	2005
Older than 65 (%)	12,5	13,4	13,8	14,2
Expension index	100	107	110	114
Older than 45 (%)	33,5	36,2	38,2	40,6
Expension index	100	108	114	121

Table 1. Middle variant of obsolescence of the Dutch population (CBS, 1993). Expected percentages of the population above 65 years old and above 45 years old.

**A) Visual Impairments. To determine the seriousness, participants could choose one of the following answers.**

Extremely severe

- a. I only can distinguish light from dark.
- b. I can not read large headlines or distinguish illustrations.

Severe

- c. I can not read usual headlines.
- d. I can not recognize someone's face on the other side of the room.

Light

- e. I have (some) difficulties with seeing.

**B) Percentage of the respondents (sample 55,000) with visual disturbances, and amount of people extrapolated to the total population.**

Value judgement of the visual impairment Amount

Value judgement of the visual impairment Amount	Answer	%
Extremely severe 16,000	a	0.1
Extremely severe 43,000	b	0.3
Severe 70,000	c	0.6
Severe 29,000	d	0.2



Light	e	3.4
467,000		
Total		
625,000		

Table 2. (CBS and Nimawo, 1990).

A) Percentage of respondents with physical impairments per age-group. The total amount of people was 100% in every sample group.

Age	Vision	Audition	Walking
Overall			
fitness			
25-34	0.7	0.4	0.7
0.8			
35-44	0.4	0.9	1.1
1.0			
45-54	0.9	1.9	2.0
2.6			
55-64	1.4	2.5	3.9
5.6			
65-74	3.1	5.1	8.4
8.9			
75-84	7.1	15.6	18.5
15.2			
85+	24.2	35.0	45.3
17.1			

B) Percentage of extremely severe visual impaired people, with additional impairments.

Difficulties with:	%
Walking	
25.7	
Rising or sitting	
14.3	
Keep standing up or sitting	
22.6	
Arm- and hand use	
13.0	
Audition	
18.0	



Speaking  
4.2  
Overall fitness  
19.0

Table 3.

Age (years)	Visual impaired women (%)	Visual impaired men (%)
25-34	0.4	0.4
35-44	0.6	0.2
45-54	1.2	0.6
55-64	2.1	0.7
65-74	4.0	1.9
75-84	7.8	5.8
85+	22.9	27.2

Table 4. Gender differences in visual impairments per age category.

W.H.O. (1979, 1992) criteria:

0.3 > visual acuity > 0.05      low vision  
20° > visual field > 10°  
0.05 > visual acuity              blindness  
10° > visual field

U.S. Criteria

0.5 > visual acuity > 0.1      low vision  
0.1 > visual acuity              blindness

Age	impairment Amount	Blindness		Visual
		W.H.O.	U.S.	W.H.O.
55-64	2,561	0.1	0.2	0.1
65-74	2,408	0.2	0.2	0.4
75-84	1,398	0.6	1.4	2.6
85+	408	3.9	5.9	11.8
Total 55+	6,775	0.5	0.8	1.4



3.8				
Total 65+	4,214	0.7	1.1	2.2
5.9				

Table 5. Prevalence of visual impairment and blindness among the elderly from (the neighbourhood of) Rotterdam. Numbers are percentages of the age groups (age group is 100%) (Klaver et al., 1998).

	Blindness (visual acuity < 0.05)	Visual impairment (0.3 > visual acuity > 0.05)
Age-related macular degeneration	58	25
Cataract	6	36
Primary <i>open-hoek</i> glaucoma	8	2
<i>Myope</i> degeneration	6	6
Optical neuropathy	6	1
Retinitis <i>pigmentosa</i>	3	-
Diabetic retinopathy	-	1

Table 6. Main causes of visual impairment and blindness among people above the age of 55 and from (the neighbourhood of) Rotterdam Numbers in the left column are percentages of the total amount of blind people and numbers in the right column are percentages of the total amount of visually impaired people.