Introduction

• Visual impairments have a devastating effect on individuals
• Younger and Sardegna (1994) state that a person’s past experiences will affect how he or she deals with vision loss.
• Consequences of vision loss or impairment are all-encompassing, impacting every area of an individual’s life.
• Level of preserved vision will affect the recommendations of the life care plan.
Life Care Planner

• Should understand the background information needed to develop a life care plan for individuals with visual impairments.
• Should be knowledgeable about resources
• Should have a thorough working knowledge of visual impairment, its effect and impact, and expertise regarding types of equipment and technology for the visually impaired, as well as possible surgical or pharmacological interventions that might benefit the individual.

Definitions

• Visual Impairment is divided into two main categories
  • Low Vision
    • Much more common than total blindness
    • Visual acuity better than 20/200 but worse than 20/70 with correction
  • Blindness
    • Visual acuity in both eyes of less than 20/200
    • Visual field of less than 20 degrees
    • despite the best correction with glasses (Panek, 2002; Deutsch & Sawyer, 2003)

Other Terminology

• Severe visual impairment (Nelson and Dimitrova, 1993)
• Legal Blindness
Epidemiology

- Variability in numbers
- Prevention of Blindness Database
- Numbers (Thylefors, et al, 1995)
- States with highest number of blind and visually impaired.
- Aging
- Birth and developmental

The National Information Center for Children and Youth with Disabilities.

- NIH addressed the race differences in some research in 2003.

Etiology

- Variety of conditions lead to visual impairments
- Leading causes for children, age 0-19 include retrolental fibroplasia, neoplasm, infections, and injuries.
- Over age 20, cataracts are the most common cause.
- 1992 data indicate the most common causes of blindness are cataracts, trauma, amblyopia, and macular degeneration, respectively.
- Additional conditions include diabetic retinopathy, glaucoma, retinitis pigmentosa (RP), stroke, and traumatic brain injuries.
- Low vision causes: birth defects, inherited diseases, injuries, diabetes, cataracts.
## Pediatric Patient

- Literature on the application of new technologies and surgical techniques in children.
- Pediatric ophthalmology
- Retinopathy of prematurity (ROP).
- Surgical management.
- Medications

## National Information Center for Children and Youth with Disabilities

- Social behaviors
- Early interventions.
- On going assessment
- Interdisciplinary approach
- Infant or child with loss of eye

## Psychological Impact

- Individual's reaction to loss of sight
- Common psychological reactions
- Sensory distortions
- Slow onset less impacting than quick onset
- Psychological counseling
Chronic Diseases for Individuals with Visual Impairments

- Musculoskeletal disorders
- Heart disease
- Eye disease
- Nervous system disease
- Glandular disorders
- Urinary disease
- Stomach or intestinal disorders
- Lung disease

Interventions

- Types of interventions
- Case example: tunnel vision versus macular degeneration
- Case example: retinitis pigmentosa versus photosensitivity

Functional Outcomes

- Age of onset and level of development
- Generalizations on the basis of a diagnosis
- Vision may fluctuate
- Individual assessment
Assistive Technology

- Definition of Assistive Technology
- There are low (non-electronically based) and high (electronically based) systems.
- Use of the technology

Technology for Visually Impaired

- Why do these devices exist?
- A low vision device Aids to Independent Living and/or
  - High tech
  - Low tech
- Durable Medical Equipment
  - High tech
  - Low tech

Low Tech Devices

- Braille and/or talking watches or clocks
- Braille print
- Books on tape
- Talking card systems
- Large numeral clocks and watches
- Large print books
- Large display phone buttons
- Writing guides
Low Tech Devices

- Tape recorders
- Labels
- Timers
- Measuring cups
- Cooking devices
- Rulers
- Large-dial telephones
- Talking labels
- Pill splitters
- Liquid medicine guides
- Insulin-measuring devices
- Computerized insulin pumps
- Liquid level indicators
- Elbow-length oven mitts to prevent burns
- Vegetable and meat slicing guides
- Self-threading needles
- Magnetic padlocks (use a magnet to open rather than a key)
- Letter writing templates
- High Marks: a liquid paste that hardens to make colored fluorescent raised letters for writing notes or labeling items that can be easily seen or felt

Modifications and Magnification

- Modifications:
  - Placement (use of adjustable paper stands)
  - Visual contrast (printing bold black letters on yellow paper)
  - Size of printed materials (increasing the standard print size)

- Magnification:
  - Magnifiers
  - Telescopic spectacles
  - Ultraviolet color shields
  - Polarized glasses to change the visual contrast or reduce glare

Use low technology applications with high technology devices (example: use non-glare filters attached to computer screens to improve the contrast)

High Technology

- Talking calculators, voltmeters, thermometers, levels, compasses, and oscilloscopes
- Digitized compass provides feedback in different languages
- Electronic mobility aids
- Descriptive video services (DVS)
- Tactile reading devices
- Optical character readers (OCRs) (example: Optacon)
- Portable Braille note takers
- Braille displays integrated with TDD (telecommunication devices)
- Modified computers
- Morse code
- Output systems such as screen reading programs, refreshable Braille displays, Braille prictionaries, Braille with traditional orthography print.
High Tech continued

- Recording for the Blind (RFB): Book Manager
- Closed circuit television (CCTV)
- Computers:
  - Input systems: speech recognition with speech synthesis, modified keyboard contrast, large keyboards, and/or the use of auditory signals.
  - Output systems: screen reading programs, text magnification programs large font size, flat screens

Bristow (1996) reports that a rehabilitation professional should consider three types of aids for the visually impaired:
- Tactile aids
- Auditory aids
- Visual aids

Low vision devices can be divided into optical and non optical devices.

Optical vs Non Optical

- Optical
  - Magnifying spectacles
  - Hand magnifiers
  - Stand magnifiers
  - Telescopes
  - Closed circuit television
- Non-optical
  - Large print books
  - Check writing guides
  - Large playing cards
  - Large telephone dials
  - High contrast watches
  - Talking clocks and calculators
  - Machines that can scan print and read out loud
Reading Technology

- CCTV
- Optical Screen Readers
- Daisy playback devices
- Handheld magnifiers
- Corning lenses
- Screen magnification software
- Large monitor
- Telescopes

Lighting

- Appropriate lighting extremely important
- Light directly on materials usually is optimum.
- Some individuals are light sensitive.
- Tinted lenses or a visor for glare problems.
- Different types of lighting.
- Use adjustable window coverings to regulate amount of natural light in room.

Mobility Devices

- Sighted guide technique
- Guide dogs
- Canes (low technology assistance)
- Walkers
Personal Care and Homemaker Services

- Person’s needs
- Existing family support
- Age of person
- Degree of independence
- What type of respite needed?
- Home accessibility and home modifications

Ranked List of “Most Important” Devices
(Selected from Jones, Toronto, 2004)

1. Eyeglasses
2. Cane
3. Wheelchair
4. Walker
5. Telephone
6. Grab bar
7. TV remote
8. Magnifying glass
9. Microwave oven
10. Bathroom equipment
11. Hearing aid
12. Raised toilet seat
13. 3-in-1 commode
14. Dentures
15. Hospital bed
16. Reacher
17. Scooter
18. Print enlargement system/CCT
19. Crutches
20. Computer
21. Handheld shower hose
22. Incontinence briefs
23. Oxygen tank
24. Bath mat
25. Answering machine

SMART HOMES

- Smart microwaves, refrigerators*, washer/dryer*
- Voice validation software
- Structured wiring panel
- Zone controller for temperature
- Appliance and lamp modules
- Bluetooth headset/microphone for multiple zones within house
- PR 3000 2000-watt uninterruptible power supply (UPS)
- Camera Surveillance
- Integrated security system
- Masestro/Trekkker (Humanware)
- GPS locator
- Web access
- Accessible PDA
- Victor e-reader
- Mobile Speak, Pocket (screen reading software for Pocket PC and Pocket PC phones)
- Elevators
- X-10 Units
Formal Rehabilitation Services

- Topics
  - Communication with sighted world
  - Training in personal management
  - Training in household tasks
  - Accessing printed materials
  - Meal preparation
  - Mobility (in home and community)
  - Braille instruction

- Topics
  - Training in house modifications to benefit the person
  - Training in recreational activities
  - Training in financial management (banking)
  - Training in childcare management
  - Vocational training
  - Psychological counseling
  - Computer lessons

Employment Predictors

- Education level
- Type of school attended
- Technology training
- Primary reading method
- Blind vs partially sighted
- Fewer hours of rehabilitation training
- Having dependent children
- Greatest predictor: encouragement from family and friends

Current Research

- Research (Lamoureux, 2004) shows that vision difficulties associated with reading, outdoor mobility, participation in leisure activities and shopping show the greatest areas of restriction.
- Visuo-tactile sensory substitution devices for infants who are blind
- Video Magnifier
- Software operating systems
Current Research

• Medicine: Johns Hopkins University and the Lawrence Livermore Laboratory cooperating with seven other research institutions, have developed artificial retinas.

• Education: Instructional Materials Accessibility Act (IMAA)(2004).

• Visual prosthetics

Key Issues Over Next 5 Years

• Retinal, optic nerve and cortical prostheses
• Current interfacing techniques
• Thorough understanding of the neuronal substrate following years of blindness
• Integrating phosphenes into patterns representing the visual world
• Learning new visual experiences following implantation of visual prostheses

Funding Issues

• Early Intervention
• IDEA/School services
• Medicaid funding
• Medicare Part B
• Rehabilitation services
  – Alliance for Eye and Vision Research
  – Effective treatment savings
• Research funding
Example of a Life Care Plan

- Risk factors for a person with a visual impairment during life span
  - Smoking
  - Obesity
  - Circulatory health conditions (hypertension, diabetes, and heart disease)
  - Ethnicity factors: Blacks and Hispanics have greater risk of vision impairments, while Whites have greater risk of hearing impairments (dual sensory)
  - Reduced or poor education level
  - Limited finances
  - Lower status occupations (unskilled labor)
  - Aging
  - Central corneal thickness (CCT)

Resources

- Minnesota Radio Talking Book Network and Dial-In-News
- American Printing House for the Blind, Inc.
- The Lighthouse, Inc.
- Vision Loss Resources in each state such as the TECH ACT resources

Resources

- Glossary
- Bibliography
- List of Vision Providers
- Vision section of life care plan