The Valuation of the Audiologist in the Healthcare Landscape

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Presenter Disclosures:

• Financial
  • President – Otolithic, LLC
  • Presenter has received an honorarium for presenting this course

• Non-Financial
  • Section Editor – Economics, Hearing Health & Technology Matters
  • Board Member – American Board of Audiology

• Content Disclosure:
  • This learning event does not focus exclusively on any specific product or service
Rehabilitative Goal

PERSONAL CONSEQUENCES OF AN UNTREATED DISABLING HEARING LOSS

- It has a negative effect on physical and mental health
- It has a negative impact on social life and family relationships
- It has negative consequences for work life and income
- It has a strong negative impact on quality of life

pro.signiausa.com/styletto/
If Hearing Loss Affects So Many, and is Associated with Other Health Issues, What is Audiology’s Professional Value Within the Healthcare Landscape Now and into the Future?
Learning Outcomes

As a result of this course, participants will be able to:

1) Define life expectancy, better health, and how individuals value health care;

2) Explain factors that influence the demand and supply for health care and health care seeking behavior; and,

3) Summarize the different types of health utility measurements, and audiology’s impact within the healthcare landscape.

Household Economics Example

• Consider the new purchase of a refrigerator
• What considerations would be made prior to the purchase?
  • Need/Utility – Benefit resulting from the decision to purchase
  • Opportunity cost – What purchases did you give up (e.g., vacation, furniture, kitchen remodel)?
  • Quality – What factors were important towards selecting the product or service? (Examples: brand, reliability, status, cost, color,....)
  • Efficiency – Did you seek the cheapest product or one that was reputable, reliable, and, perhaps, more expensive?
**Health Economics**

• A framework for the systematic consideration of costs and benefits across society in support of priority setting and investment decision-making as it relates to “health”

• Goal is to obtain maximum benefit (i.e., outcome) towards maximizing health status at the lowest cost (i.e., amount of resources)

• Costs and benefits are determined by decision-makers (e.g., regulatory bodies, payors [insurance, third parties], clinical practice bodies, providers, patient)

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**Elements of Value**

*Challenges: Map each element into an underlying economic framework for value assessment.*

- Value
- Quality-adjusted life-years (QALY) gained
- Net costs
- Productivity
- Adherence-enhancing factors
- Reduction in uncertainty
- Value of hope
- Severity of disease
- Insurance value
- Fear of mortality

*Lakadwala et al. (2018)*
### Table 1: Value elements inventory.

<table>
<thead>
<tr>
<th>Elements of value</th>
<th>Type of element</th>
<th>Features of medical technologies in which element is relevant in value assessment</th>
<th>Consideration under health care perspective</th>
<th>Consideration under societal perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cost</td>
<td>Care</td>
<td>All</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>QALYs gained</td>
<td>Care</td>
<td>All</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Productivity</td>
<td>Common but inconsistently included</td>
<td>Relevant when treatment has an impact on productivity</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Adverse-improving factors</td>
<td>Common but inconsistently included</td>
<td>Relevant when features of the treatment itself improve adherence with the treatment</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Value of reduction of uncertainty due to a new diagnosis</td>
<td>Novel</td>
<td>Relevant when the treatment is accompanied by a component diagnostic test</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fear of contagion</td>
<td>Fear (novel)</td>
<td>Relevant when dealing with treatments for infectious diseases</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Risk of contagion</td>
<td>Risk (novel)</td>
<td>Relevant when baseline health status is particularly poor</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Insurer value</td>
<td>Novel</td>
<td>Relevant when considering treatments for end-of-life care or high-severity conditions</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Severity of disease</td>
<td>Novel</td>
<td>Relevant when therapy loses uncertain effects that cannot be predicted beforehand by a diagnostic test</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Value of hope</td>
<td>Novel</td>
<td>Relevant when technology extends the life of patient</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Real option value</td>
<td>Novel</td>
<td>Relevant when technology identifies a new mechanism of action or mode of delivery</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

QALY: quality-adjusted life-year.

Lakadwala et al (2018)

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**Home Economics**

**Health Economics**
In 1977, Dr. Gruenberg predicted that medical research and health technologies would successfully add more years to life expectancy, but less successful when it came to adding better health to those years.

Life Expectancy (2018) = 78.7 years
Chronic Disease Prevalence and Age


US Health Economics – All Healthcare

1970s  1990s  2010s

Demand

Intervention Options

Resources
### Chronic Health Issues

<table>
<thead>
<tr>
<th>Year</th>
<th>Top 10 Causes of Disability</th>
</tr>
</thead>
</table>

YLDs, years lived with disability.


### Health Economics and Hearing Care

#### 1990s
- **Demand**
- **Intervention Options**
- **Resources**

#### 2010s
## Demand

<table>
<thead>
<tr>
<th>MarkeTrak Survey</th>
<th>MT9 - 2014</th>
<th>MT10 - 2018</th>
<th>Est - 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Population (millions)</td>
<td>318.6</td>
<td>327.2</td>
<td>347.3</td>
</tr>
<tr>
<td>Hearing Loss Incidence</td>
<td>10.6%</td>
<td>10.8%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Adoption Rate</td>
<td>30.2%</td>
<td>34.1%</td>
<td>38.0%</td>
</tr>
<tr>
<td>Active Wearer Population (millions)</td>
<td>10.2</td>
<td>12.1</td>
<td>14.6</td>
</tr>
</tbody>
</table>

Interventions

Are We Where We Want to Be?

Valente & Amlani (2017)
Service Delivery Model

Inputs
- Skilled, motivated, happy employees
- Customer requirements
- Raw materials
- Capital

Processing system
- Design of products and services
- Production of products
- Delivery of services

Outputs
- Products
- Services
- Financial results

Outcomes
- Delighted customers
- Customers' needs met

Goal
- Repeat Business

Where Audiology Service Delivery Falls Short

Inputs
- Skilled, motivated, happy employees
- Customer requirements
- Raw materials
- Capital

Processing system
- Design of products and services
- Production of products
- Delivery of services

Outputs
- Products
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- Financial results

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- Delighted customers
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Goal
- Repeat Business

Source: Brown, 1996

IMPACT

Clinical Outcomes – Clinical Trials or Meta-Analysis(es)
Utility Outcomes – QALY or DALY
Monetary Outcomes – Cost-Benefit Analysis
United States Preventive Services Task Force Recommendation for Hearing-Loss Screening Among Older Adults
An Opportunity in Insufficient Evidence

Nicholas S. Reed, Aud.D, Ellen L. O’S, MD, PhD

Resources
If Audiology Had Grown at Benchmark Rate

Bray & Amlani (2020)

If Audiology Had Grown at Benchmark Rate…

Bray & Amlani (2020)

\[ y = 94.143x - 177,242 \]

1999 = (94.143 x 1999) - 177,242
2019 = (94.143 x 2019) - 177,242
2019 value = 12,832
Growth = (12,832 - 10,942) / 10,942
20 Year Growth = 18.3%

Audiology Workforce (BLS)

29-1181 Audiology

Goal: Reduce economic costs on the health system and make costs equal across patients by altering the practice behavior of providers...without the regard to the quality of those services

https://academic.udayton.edu/health/02organ/manage01c.htm
Changing the Dialogue

Health: What is it and How is it Valued?
Definition of **Health**

- The word ‘health’ was derived from the old English word ‘hoelth’, which meant a state of being sound, and was generally used to infer a soundness of the body and absence of disease.
- Health is the level of functional and/or metabolic efficiency of a living being.
  - In humans, it is the general condition of a person in mind, body and spirit, usually meaning to being free from illness, injury or pain.
- According to the WHO (1948) – “Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”

How is **Health** Valued?

[Diagram showing various aspects of health]
**Health is Not an “Economic Good”**

Money can buy medicines only, not the health.

https://hyedisease.com/money-can-buy-medicines-only-not-health/

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**If Health Can’t be Bought, Then How is Health Care Valued**

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Amlani - Valuation of the Audiologist. 2021
MAC Conference
Health Care’s Value Proposition: Reducing Uncertainty and Risk

- Difficult to predict a decline in health (i.e., uncertainty)
  - Future health is uncertain
- Healthcare is costly
- People are “risk-averse”

- Insurance provides protection against uncertainty and risk
  - Insurance is offered as an “economic good”
### How Absolute Risk-Aversion Changes with Health

<table>
<thead>
<tr>
<th>Type of Risk-Aversion</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing absolute risk-aversion</td>
<td>As <strong>health</strong> increases (healthier), less interested in <strong>risky treatments</strong></td>
</tr>
<tr>
<td>Constant absolute risk-aversion</td>
<td>As health is stable, hold the <strong>same interest</strong> in <strong>risky treatments</strong></td>
</tr>
<tr>
<td>Decreasing absolute risk-aversion</td>
<td>As <strong>health decreases</strong> (sicker), more interested in <strong>risky treatments</strong></td>
</tr>
</tbody>
</table>

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Objective 1 - Summary

- People are living longer, but healthcare has not kept up to adding better health for those years
- Overall healthcare demand, interventions, and resources have increased
  - In hearing healthcare, demand has increased, intervention has remained stagnant, and resources have decreased markedly
- People value health with respect to a healthy life and core principles
- Health is not a commodity, and its value proposition is reducing risk and uncertainty through insurance coverage and services

Learning Outcomes

As a result of this course, participants will be able to:

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2) Explain factors that influence the demand and supply for healthcare and health care seeking behavior; and,

3) Summarize the different types of health utility measurements, and audiology’s impact within the healthcare landscape.
**Demand** Individuals Needs are Met

**Market** Matching of Competencies, Health Needs, and Ability to Pay

**Supply** Providers who are competent, Offer resources

Gross Domestic Product is the total value created through the production of goods and services during a time period.

Source: Peterson-Kaiser Health Systems Tracker


Premiums and Deductibles Rise Faster than Worker’s Wages Over Past Decade

Private Insurances Towards Hearing Aids and Services

• Most insurers do not provide coverage for hearing aids
  • Coverage varies by plan and in administration (examples below)
    1. Specified amount provided toward purchase (e.g., $x per ear), and benefit renews after a number of years (e.g., three-years)
    2. Allowance towards purchase when product/service comes from contracted provider
      • Bilateral devices total $$$$$, health plan offer $$ allowance, out-of-pocket equals $$
    3. Health plan offers negotiated discounts with contracted providers
      • Patient receives discount (e.g., 25%) off retail price from contracted provider

**Benefits of Managed Care**

Gross Domestic Product is the total value created through the production of goods and services during a time period.
Audiologists are classified as diagnosticians; not as therapeutic providers. Thus, reimbursement is provided for the former (Part B), not the latter (Part C).

Audiology services require physician order.

Medicaid Has Many Vital Roles in our Health Care System

- Health Insurance Coverage
  31 million children & 16 million adults in low-income families; 16 million elderly and persons with disabilities.

- Assistance to Medicare Beneficiaries
  9.4 million aged and disabled — 20% of Medicare beneficiaries.

- Long-Term Care Assistance
  1.6 million institutional residents; 2.8 million community-based residents.

Support for Health Care System and Safety-net
16% of national health spending; 40% of long-term care services.

State Capacity for Health Coverage
Federal share can range from 50-83%; For FY 2013, ranges from 50-73.4%.
Demand: Individuals Needs are Met

Market: Matching of Competencies, Health Needs, and Ability to Pay

Supply: Providers who are competent, Offer resources, Accessibility and affordability
HEARING AIDS: AN UNMET NEED

Current production of hearing aids meets less than 10% of the global need.

It is estimated that in developing countries, about 20% of people who have hearing loss require hearing aids, suggesting 72 million potential hearing aid users worldwide. However, current production of hearing aids meets less than 10% of the global need. In developing countries, less than 3% of people who need a hearing aid are thought to have one.

Making affordable and properly fitted hearing aids and follow-up services available and accessible in all parts of the world will benefit many people with hearing loss. Hearing aid services must also address the issue of fitting, maintenance and battery provision. It is important to ensure full access to learning and living environments for all persons with hearing loss. In particular, teaching in sign language benefits children with hearing loss, while provision of captioning and sign language interpretation on television facilitates access to information.
Objective 2 - Summary

• US private insurance premiums and patient out-of-pocket expenses have increased over time
  • US healthcare is one of the most expensive in the world
• Perceived value towards private healthcare market is low
• For hearing healthcare, there are opportunities with the “right” managed care program to provide services and be profitable

• Demand for hearing care exceeds supply on a global level
• Labor opportunities exist via audiology assistants
• Shortage of technology supply is a factor for direct-to-consumer product proliferation

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Health Economic Evaluation

- Measures the benefit of treatment interventions on improving health-related quality of life (HRQoL) through outcomes research
  - The impact of the outcomes research information to governments, payers, health ministries, intervention options

- The decision to select a given intervention is guided by assessing
  - (1) the costs associated with that treatment intervention,
  - (2) the benefits of that treatment intervention, and
  - (3) how these factors compare to all illnesses, diseases, and injuries within healthcare.
  - clinicians, and patients who, then, adequately compare and select among the available

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**Inputs**
- Skilled, motivated, happy employees
- Customer requirements
- Raw materials
- Capital

**Processing system**
- Design of products and services
- Production of products
- Delivery of services

**Outputs**
- Products
- Services
- Financial results

**Outcomes**
- Delighted customers
- Customers' needs met

**Goal**
- Repeat Business

**Input measures**
- Productivity

**Source:** Brown, 1996

**IMPACT**
- Clinical Outcomes – Clinical Trials or Meta-Analysis(es)
- Utility Outcomes – QALY or DALY
- Monetary Outcomes – Cost-Benefit Analysis
Health Economic Evaluations and Audiology

Partial Economic Evaluations

- **Cost-of-Illness (i.e., burden/costs attributed to a disease)**
  - **Huddle (2017)** – Hearing loss impacted US worker productivity between $1.8 and $194 billion, while medical costs ranged between $3.3 and $12.8 billion
  - **Ruberg (2019)** – Hearing loss equates to a loss of annual productivity equating to $9,100 per American and $9,260 per European
  - **McDaid et al (2021)** - Total global economic costs of hearing loss exceeded $981 billion.
    - 47% of costs were related to quality-of-life losses, with 32% due to additional costs of poor health in people with hearing loss
    - 57% of costs were outside of high-income countries. 6.5% of costs were for children aged 0–14
    - A 5% reduction in prevalence of hearing loss would reduce global costs by $49 billion
Health Economic Evaluations and Audiology

Partial Economic Evaluations

Cost Analysis

- Systematic and itemized break down of the fixed and variable direct (e.g., labor, materials) and indirect costs (e.g., supplies, utilities, equipment) associated with a treatment intervention
- A thorough cost analysis is a requisite before proceeding with any of the full economic evaluations

Valente (2021)
Health Economic Evaluations and Audiology

**Full Economic Evaluations**

- *Cost-Benefit Analysis (i.e., gold standard because CBA evaluates all costs and benefits using a common metric [dollars, life expectancy,...])**
  - Brent (2019) – Found that hearing aid use provided a benefit over costs by 30:1, while also reducing dementia symptoms in listeners.
Health Economic Evaluations and Audiology

Full Economic Evaluations

• *Willingness-to-pay is a CBA Approach*

  • Chisolm and Abrams (2001) – Examined how much Veterans were WTP for their hearing aids as a function of the benefit they received from APHAB
  
  • Results revealed a WTP of $203.30 with no measurable APHAB global benefit and an additional $22.06 for each point increase in APHAB global benefit

Health Economic Evaluations and Audiology

Full Economic Evaluations

◦ *Cost-Utility Analysis*

  ◦ Abrams et al (2002) compared hearing aid use alone (HA) to hearing aid use with audiological rehabilitation (HA + AR) in the Veteran population
  
  ◦ Results revealed cost of $60.00 and $31.91 for the HA and HA + AR, respectively, indicating that the latter (HA + AR) was the more cost-effective intervention
Health Economic Evaluations and Audiology

**Full Economic Evaluations**

- **Cost-Effectiveness Analysis** (i.e., compares improvement in dollars spent between varying interventions (e.g., unaided, aided) for the same health outcome (e.g., % improvement, QALY))

- Chao and Chen (2008) found hearing aids to be a cost-effective treatment in Taiwan for adults aged 50 to 80 when compared to nonuse of hearing aids at an estimated $13,615/QALY for men and $9,702/QALY for women

- Joore et al (2003) found the cost-effectiveness of hearing aid fittings compared to non-fittings in the Netherlands yielded an estimate of €15,807/QALY

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**A Cost-Effective Comparison Between Prevailing and Impending Amplification Treatment Interventions**

- **Average age = 66.0 years (SD = 4.3)**
  - Females=24; Males = 27
  - First-time Users

- **Average age = 67.5 years (SD = 4.7)**
  - Females=30; Males = 26
  - First-time Users

- **Average age = 61.3 years (SD = 5.0)**
  - Females=8; Males = 25
  - First-time Users
### A Cost-Effective Comparison Between Prevailing and Impending Amplification Treatment Interventions

<table>
<thead>
<tr>
<th></th>
<th>EC</th>
<th>RV</th>
<th>BN</th>
<th>AV</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NBP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unaided</td>
<td>43.7</td>
<td>60.1</td>
<td>56.0</td>
<td>27.6</td>
<td>53.3</td>
</tr>
<tr>
<td>Aided</td>
<td>29.9</td>
<td>50.8</td>
<td>43.3</td>
<td>4.8</td>
<td>41.3</td>
</tr>
<tr>
<td>Difference</td>
<td><strong>13.8</strong></td>
<td><strong>9.3</strong></td>
<td><strong>12.7</strong></td>
<td><strong>22.8</strong></td>
<td><strong>11.9</strong></td>
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<td><strong>BP</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Unaided</td>
<td>45.5</td>
<td>60.1</td>
<td>57.5</td>
<td>22.8</td>
<td>54.4</td>
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<td>36.8</td>
<td>21.9</td>
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<tr>
<td>Difference</td>
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<td>23.3</td>
<td>35.6</td>
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<td><strong>SF</strong></td>
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<tr>
<td>Unaided</td>
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<td>39.9</td>
<td>16.6</td>
<td>34.9</td>
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<tr>
<td>Difference</td>
<td>20.6</td>
<td>16.4</td>
<td>15.6</td>
<td>16.6</td>
<td>17.5</td>
</tr>
</tbody>
</table>
### A Cost-Effective Comparison Between Prevailing and Impending Amplification Treatment Interventions

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Mean Product Retail Price – Single Unit (SD)</th>
<th>Mean Professional Services Fee (SD)</th>
<th>Retail Costs</th>
<th>Life Expectancy (years)</th>
<th>Utility (Quality of Life)</th>
<th>Quality-Adjusted Life Expectancy (QALYs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBP (n = 51)</td>
<td>$1178 (SD = $93)</td>
<td>$800 (SD = $120)</td>
<td>$3156</td>
<td>11.2</td>
<td>0.587</td>
<td>6.57</td>
</tr>
<tr>
<td>BP (n = 56)</td>
<td>$1266 (SD = $141)</td>
<td>$830 (SD = $107)</td>
<td>$3362</td>
<td>12.7</td>
<td>0.742</td>
<td>9.42</td>
</tr>
<tr>
<td>SF* (n = 33)</td>
<td>$499</td>
<td>$249</td>
<td>$748</td>
<td>17.4</td>
<td>0.651</td>
<td>11.33</td>
</tr>
</tbody>
</table>

*Single Practice

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**Graph**: Incremental Cost vs. Incremental Effectiveness
Objective 3 - Summary

• Hearing care has demonstrated
  • Burden of hearing loss
  • ...But failed to demonstrate benefits from full economic analyses that showcase our value in the overall healthcare landscape
  • This outcome is one reason that the profession receives fewer monetary subsidies
  • *These shortcomings lend to future opportunities*

Opportunities to Enhance Valuation
Say Yes to Preventive Healthcare!
Stay one step ahead of diseases
The best way to lead a healthy & happy lifestyle is to ward off diseases before they even exist.
How Does Audiology Decrease Risk to Increase Value for Milder Losses?

Health Literacy and Prevention – *NOT* Scare Tactics or Sales Approaches
How Does Audiology Decrease Risk to Increase Value for Milder Losses?

Decouple Services from Products
“At the county level, the proportion of older adults reporting difficulty hearing is negatively associated with audiologist supply. The findings show that audiologists tend to locate in metropolitan counties with higher median household incomes, younger populations, and lower proportions of older adults reporting hearing difficulty, suggesting an inverse care-type relationship between audiologist availability and need for hearing health services.”

Thank You
E-mail: Otolithic@outlook.com