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AMERICAN
ACADEMY OF
AUDIOLOGY



Improving Adult Hearing Care in the U.S. Through Multidisciplinary Collaboration, in partnership with the American Academy of Audiology

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Disclosures

- **Presenter Disclosure:** Financial: Sarah Sydlowski is employed by the Cleveland Clinic, Program Director, Institute for CI Training (ICIT), and is a funded research/consultant for Cochlear Americas. Non-financial: Sarah Sydlowski is Co-Chair, Hearing Health Collaborative. She is a Past President of the American Academy of Audiology. Financial: Erin Miller is employed by the University of Akron. Non-financial: Erin Miller is the Secretary, Hearing Health Collaborative, the AAA representative to the American Medical Association HCPAC, and is Past President of the American Academy of Audiology. Financial disclosures: Ian Windmill is employed by the University of Kentucky and DMC, Regeneron Therapeutics. Non-financial: Ian Windmill is the Treasurer, Hearing Health Collaborative, and Past President, American Academy of Audiology. Financial: Matthew Carlson is employed by the Department of Otolaryngology at the Mayo Clinic (Rochester). Non-financial: Matthew Carlson has no non-financial disclosures.
- **Content Disclosure:** This learning event does not focus exclusively on any specific product or service.
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Limitations/Risks

- The applicability and accuracy of the course content may vary by the clinical, geographical, and cultural context; you should evaluate the course accordingly.
- As healthcare is rapidly evolving, new findings may change the validity of the information presented in this course. Providers should always consult the latest research and guidelines from professional associations.
- The interventions discussed in this course may be limited in generalizability, requiring practitioners to consider specific individual and population factors.
- The course may not cover all possible risk factors, diagnostic methods, or treatment options, and complex cases may require additional considerations.
- Healthcare providers should apply cultural competence and sensitivity to ensure effective and respectful care based on their patients' diverse needs.
- Providers should always evaluate the limitations of diagnostic and screening tools, considering their potential for false results as well as any ethical implications.
- It is the responsibility of course participants to critically evaluate the evidence from multiple sources to guide professional practice.



Learning Outcomes

After this course, participants will be able to:

- Discuss the public health crisis that is the current status of hearing healthcare in the United States.
- Summarize the A3 process and its application to identifying the root causes of hearing device underutilization in the United States.
- List three identified countermeasures that could effectively close the gap on under-identified and under-treated hearing loss.



There is a public health gap for hearing care.

Current state

Optimal hearing care



Adult Hearing Care in the U.S.

<https://www.nidcd.nih.gov/health/statistics/quick-statistics-hearing>

Nassiri AM, Sorkin D, and Carlson M:
Current estimates of cochlear implant
utilization in the U.S., Otol Neurotol. Jun,
022; 43(5): e558-e562.

Nassiri AM, Sorkin D, and Carlson M:
Current estimates of cochlear implant
utilization in the U.S., Otol Neurotol. Jun,
022; 43(5): e558-e562

75% of hearing loss is undiagnosed and
untreated

Approximately 29 M could benefit from
hearing aids

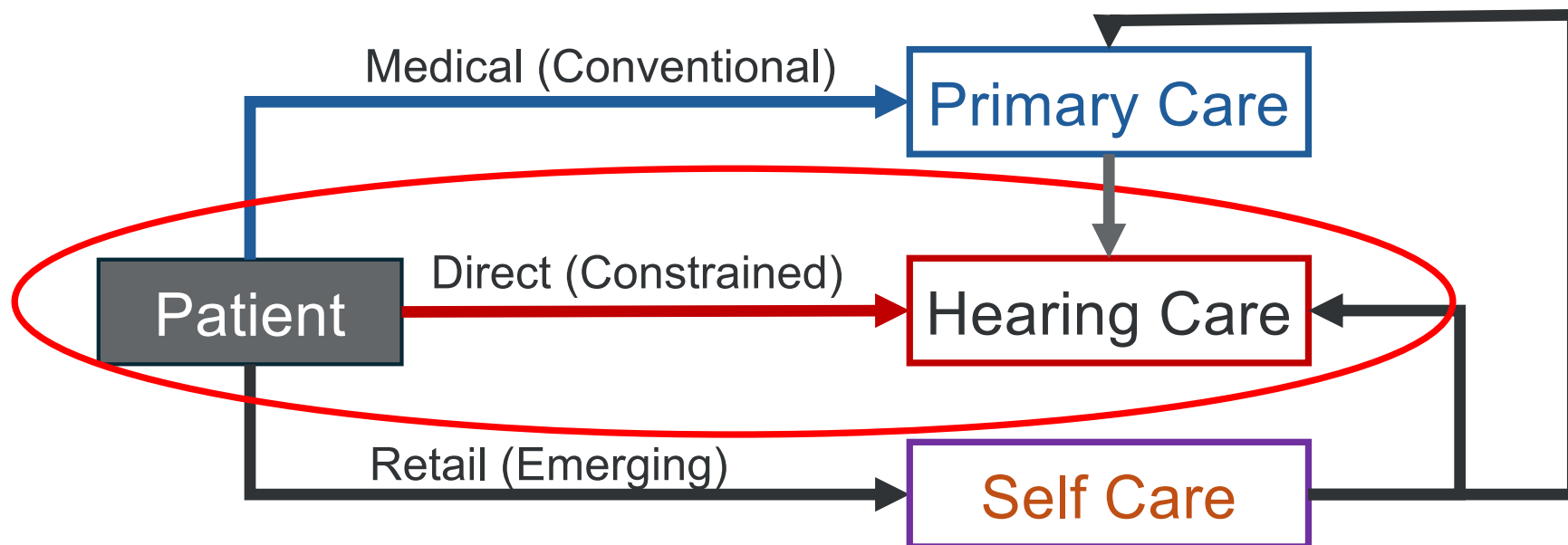
Hearing Aid Utilization:
16% of adults 20-69 y.o.
<30% of adults 70+ y.o.

CI Utilization:
Traditional Criteria = 12.7%
Expanded Criteria = 2.1%

Problem Statement

- In the U.S., approx. 29M out of 38M adults with hearing loss are untreated or undertreated, frequently there is a delay of 10 years or more when addressing hearing loss.
- It is important to close the gap because hearing loss has been associated with communication difficulties, lower health related quality of life, and decreased physical and cognitive function.

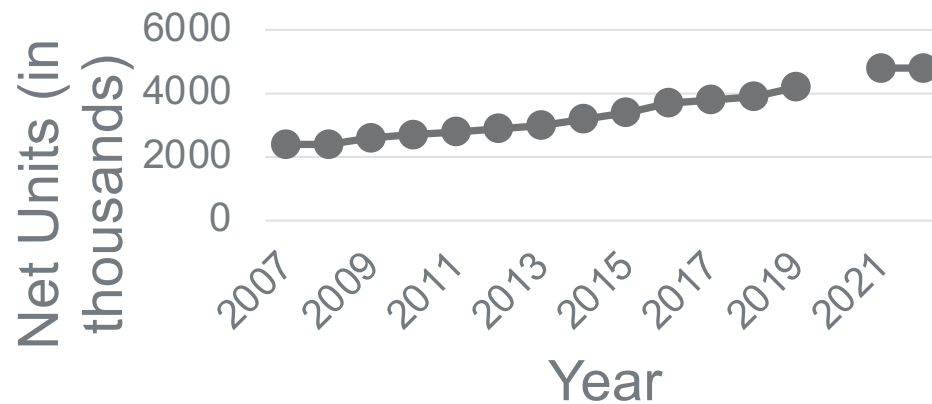
How do persons access hearing care?



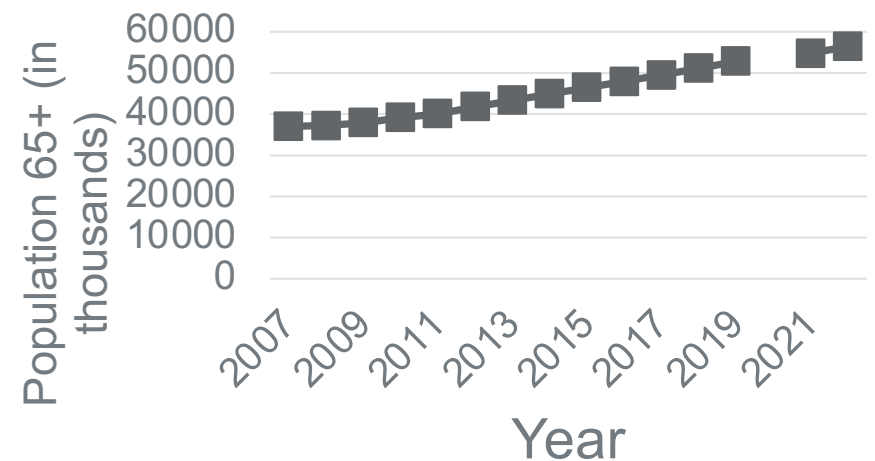
The business/political approach to increasing access to hearing care

- Local Level
 - Regional demographics
 - Pricing strategies
 - Competition
 - Social media engagement
 - Search engine optimization (SEO)
 - Practice Advertising
- National Level
 - National brands
 - Medicare Advantage programs
 - Organizations
- Political
 - State and national legislation
 - Lobbying payers

Net Unit Hearing Aid Sales in the U.S. (Private + VA)



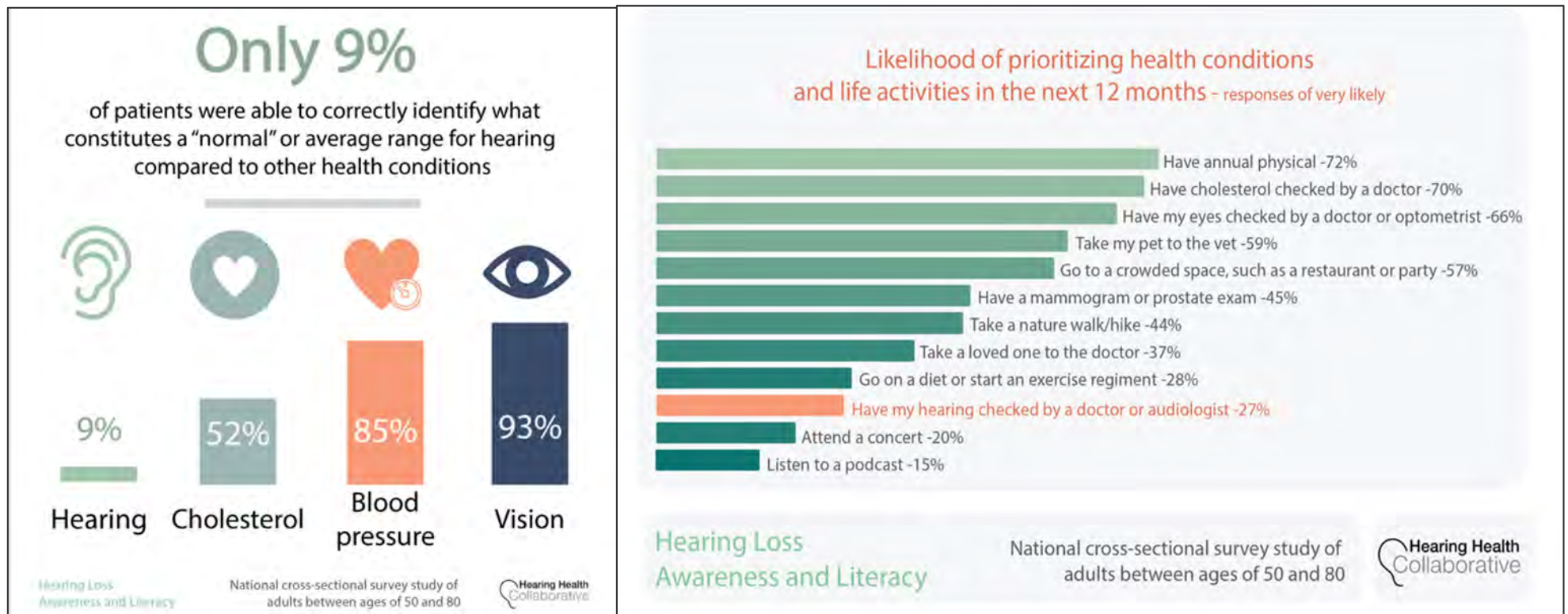
65+ Population in the United States



Net Unit Hearing Aid Sales: Data from the Hearing Industries Association (HIA)

US Population: <https://www.macrotrends.net/global-metrics/countries/usa/united-states/population>

Awareness, Perceptions, and Literacy Surrounding Hearing Loss and Hearing Rehabilitation Among the Adult Population in the United States

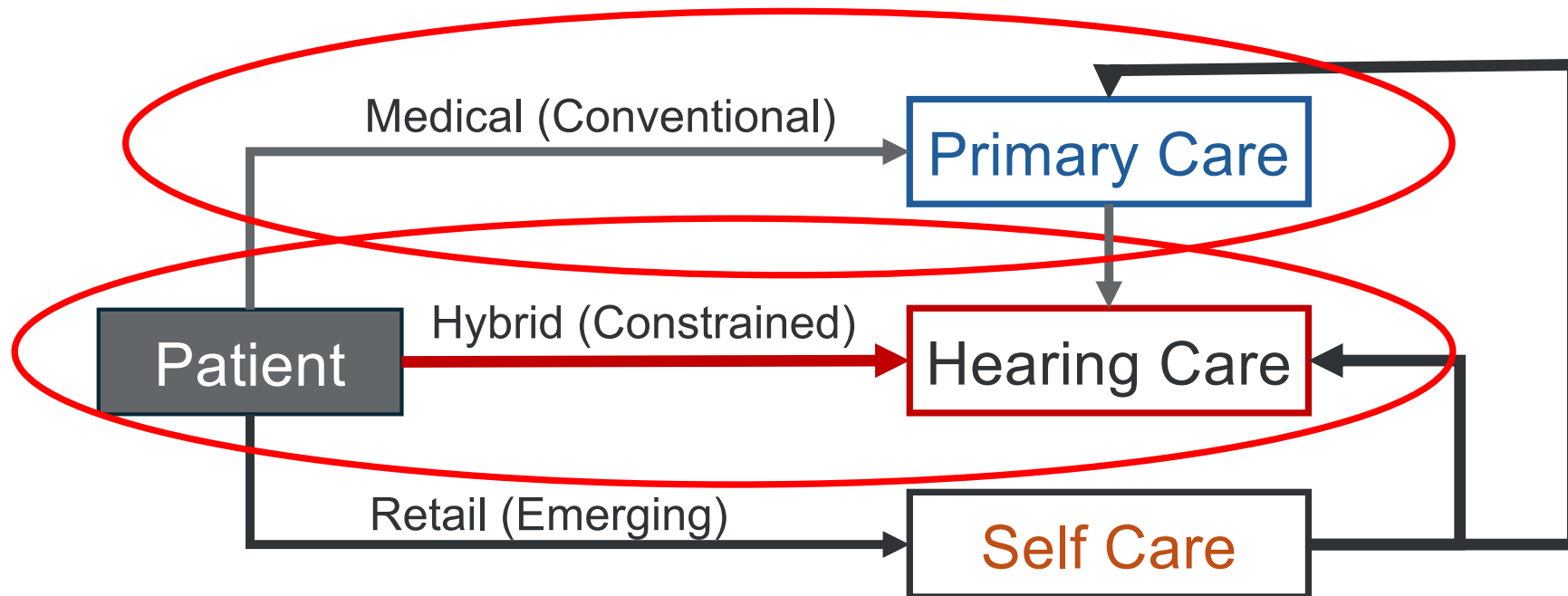


Older adults' perceptions of current and future hearing healthcare services in Australia, England, US and Canada

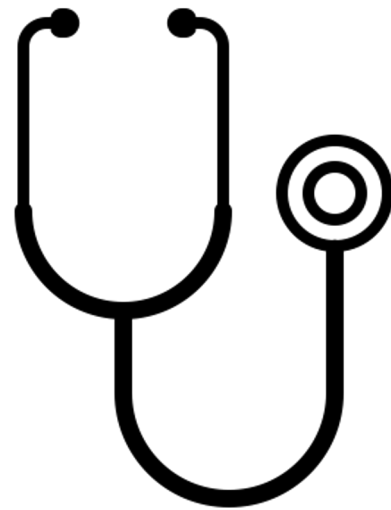
- Participants overwhelmingly equated HHC service with purchasing hearing aids.
- Poor promotion of hearing screening, hearing devices and HHC by healthcare providers
- Desired a physician's recommendation to see a HHC provider or obtain a hearing aid
- More (and trusted) information about HHC services and treatment options for hearing loss.

McMahon CM, Mosley CL, Pichora-Fuller MK, Adrian C Davis AC, Baylor CR, Yorkston CM, Tremblay KL. Public Health Res Pract. 2021;31(5):e3152128.

How do persons access hearing care?



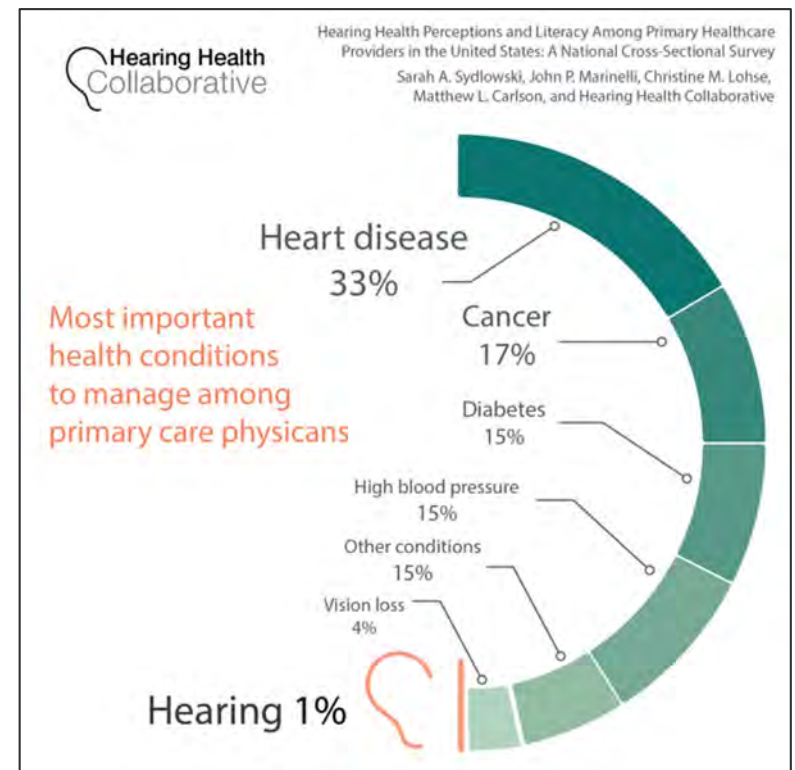
Gaps within the medical pathway



Hearing Health Perceptions and Literacy Among Primary Healthcare Providers in the United States: A National Cross-Sectional Survey.

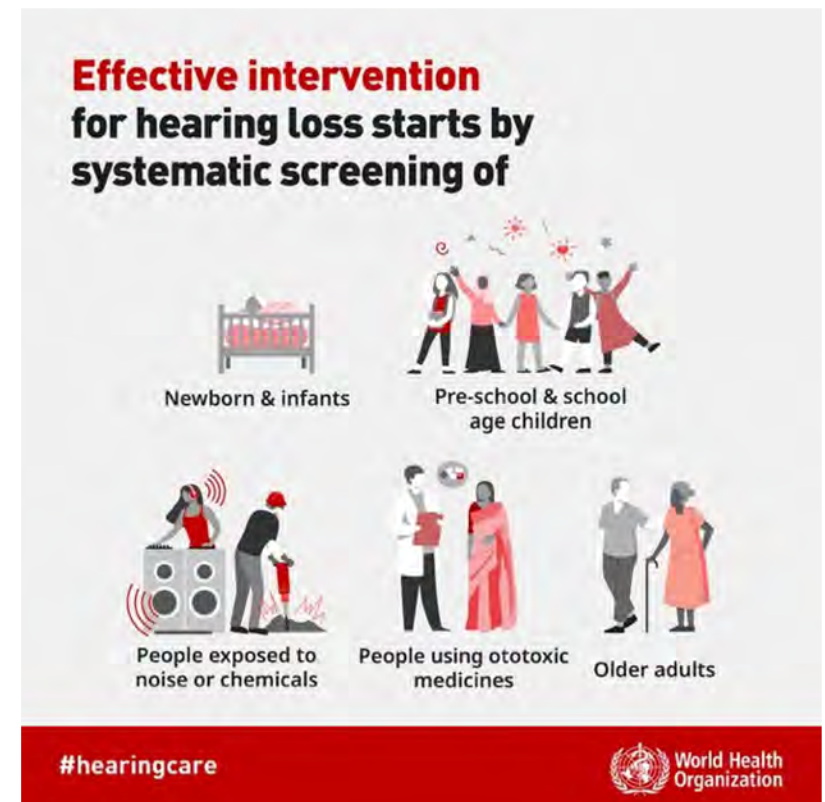
Knowledge of “normal” hearing health metrics

- Think “normal” hearing is important for patients to know: 95%
- Know “normal” hearing: 57%
- Think hearing loss is treatable: 40%
- Think hearing loss is preventable: 17%



Hearing screening in primary care?

- Screening in Primary Care
 - 20% screen for hearing loss
 - <5% refer
- Screening Options
 - Finger rub
 - Whisper Test
 - Pure tone
 - History questions
 - Questionnaires



US Preventive Services Task Force (USPSTF) 2021 Recommendations on Hearing Screening

For adults 50 years or older who have not noticed any issues with their hearing: The USPSTF found that the evidence is insufficient to assess the balance of benefits and harms of screening for hearing loss in older adults. More research is needed.

- PCPs generally agreed that hearing loss negatively affects patients but reported low screening rates.
- PCPs reported barriers to screening and treatment include lack of knowledge, poor perception of HHC, lack of time, and lack of reimbursement.
- Patient barriers include a lack of awareness of hearing loss; confusion about options for accessing hearing-related care and decision-making related to treatment options, preferences, and cost.

Effective Hearing Loss Screening in Primary Care: The Early Auditory Referral-Primary Care Study

- Early Auditory Referral-Primary Care (EAR-PC) study implemented Best Practice Alerts in EMR
 - Appropriate referrals of all patients aged ≥ 55 years increased 6x
 - 78% of those referred had hearing loss
 - 60% received hearing aids

Communication between PCP and HHP

“Mild, low frequency, mixed loss with a precipitous drop to a moderate to severe sensorineural hearing loss in the right ear, and a mild to moderate sensorineural loss in the left ear.”

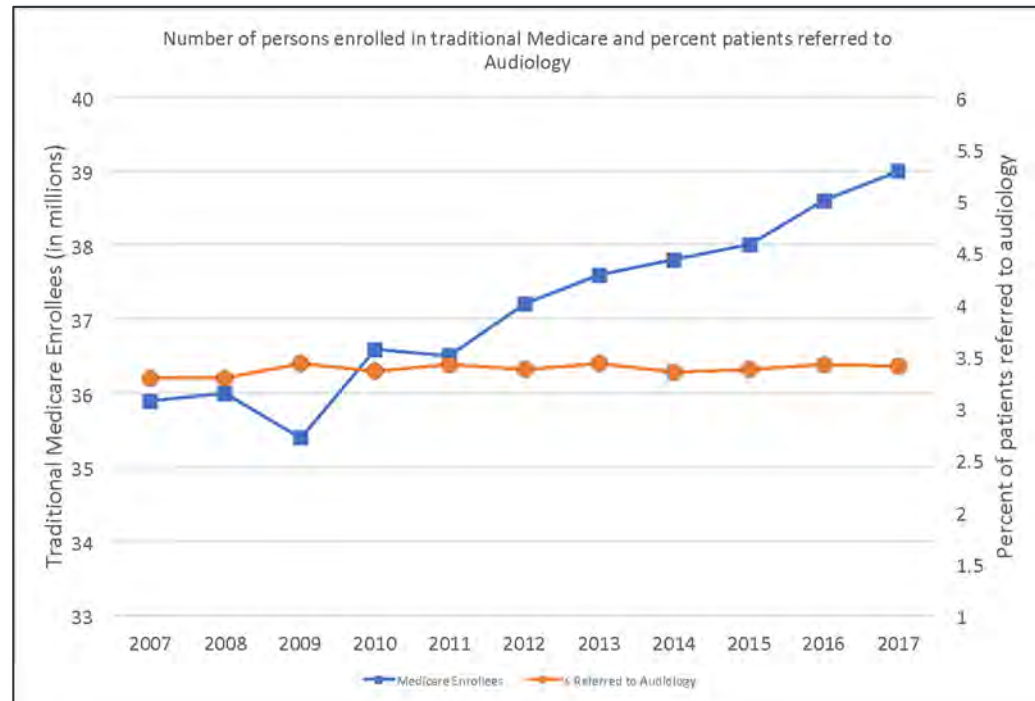
- Hard to understand by those not trained in otolaryngology and audiology
- Variable language confuses healthcare professionals, those with hearing loss and the general public.
- Creates ambiguity in how and when to treat with variable solutions - even within audiology and otolaryngology



Traditional Enrolled = 35,270,914
with HL = 10,816,834
Audiograms = 1,274,678
Referral Rate = 3.61%

2022 Data

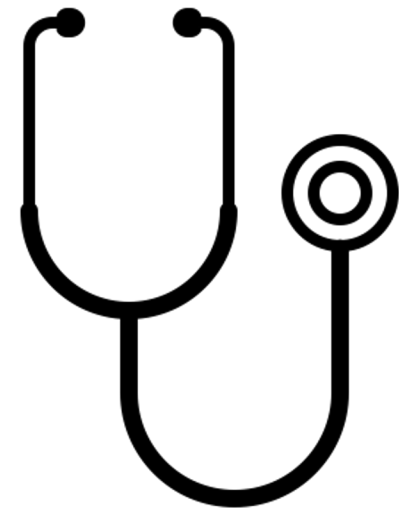
<https://data.cms.gov/summary-statistics-on-beneficiary-enrollment/medicare-and-medicare-reports/medicare-monthly-enrollment/data>





Gaps within the medical pathway

- Knowledge about hearing loss
 - Normal hearing
 - Treatment options
 - Provider options
- Screening options
- Communication/language





How to bridge the Gap?

**Hearing
Health
Collaborative**



A broken bridge by Malcolm Neal, CC BY-SA 2.0 <<https://commons.wikimedia.org/licenses/by-sa/2.0/>>, via Wikimedia Commons





Hearing Health Collaborative

A STANDARD OF CARE INITIATIVE
FOR THE UNITED STATES OF AMERICA

<https://adulthearing.com/hearing-health-collaborative/>

Audiology, Otolaryngology, Geriatric Medicine,
Family Practice, Internal Medicine, Epidemiology,
HLAA, Industry, AAA, ASHA

- and still expanding



BHAG Goals:

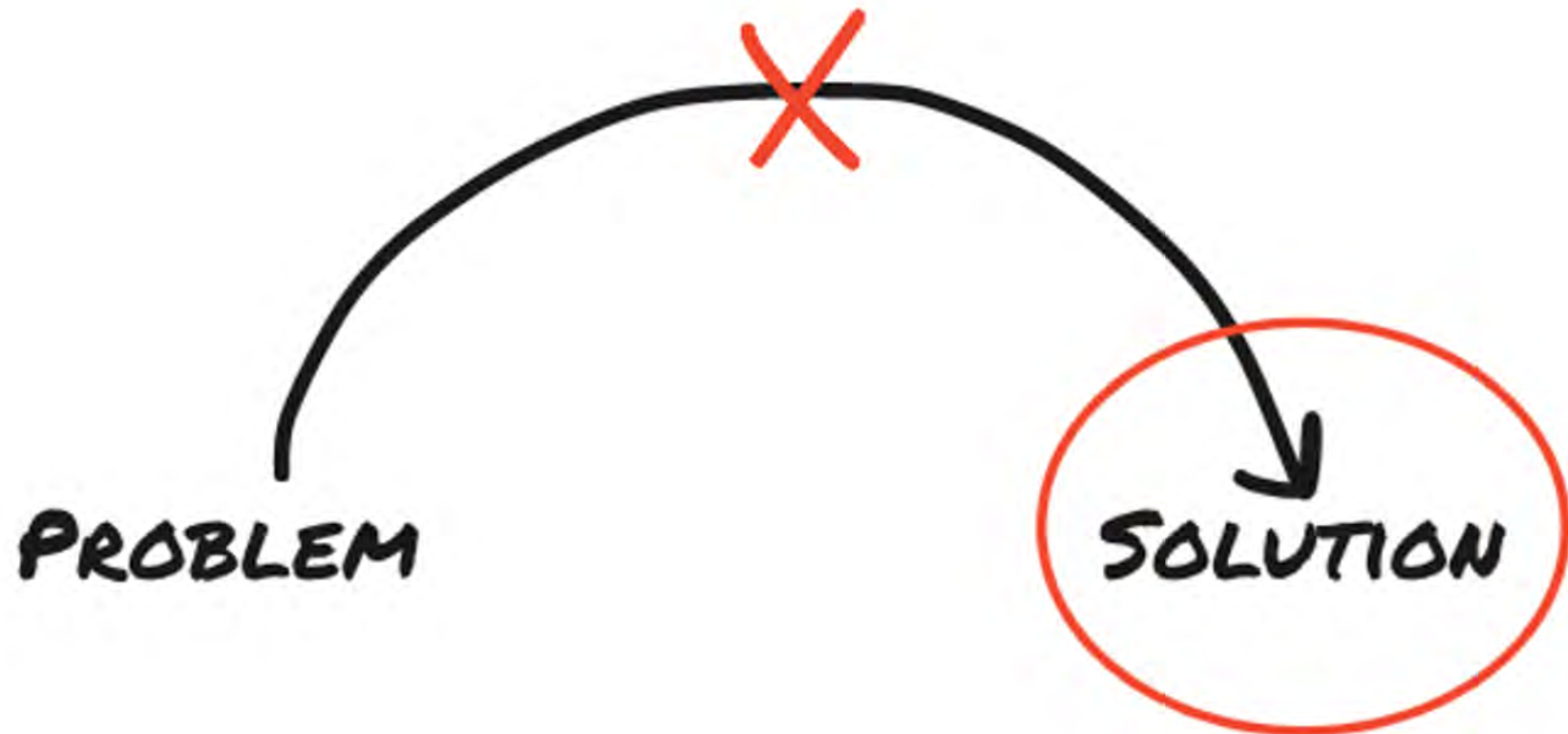
Decrease
undiagnosed
hearing loss by
50%

Double the
persons using
hearing aids

Double the
persons utilizing
cochlear
implants



**INSANITY: DOING THE SAME
THING OVER AND OVER
AGAIN AND EXPECTING
DIFFERENT RESULTS**



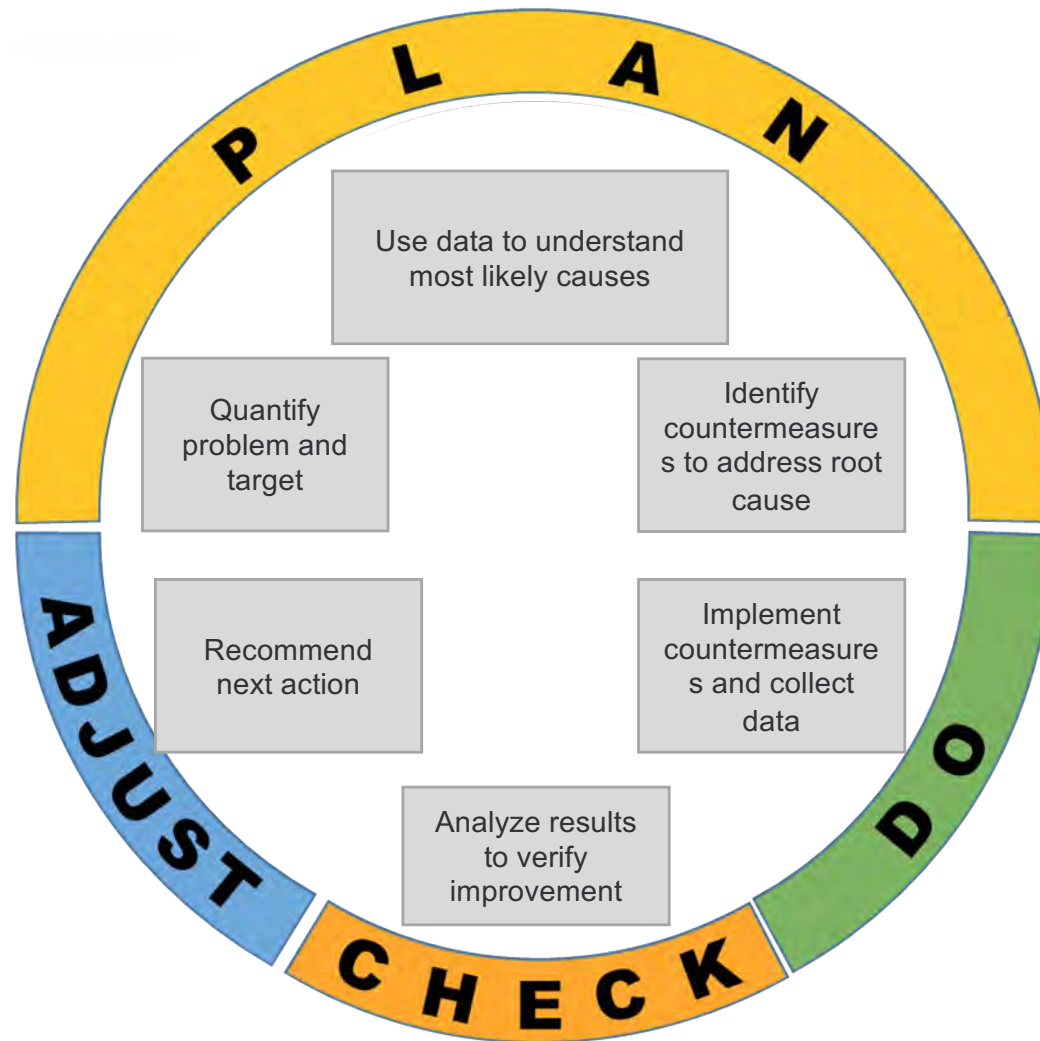


HHC 2021-present

“If I had 9 hours to cut down a tree, I’d spend the first 6 hours sharpening the ax.”

- Abraham Lincoln

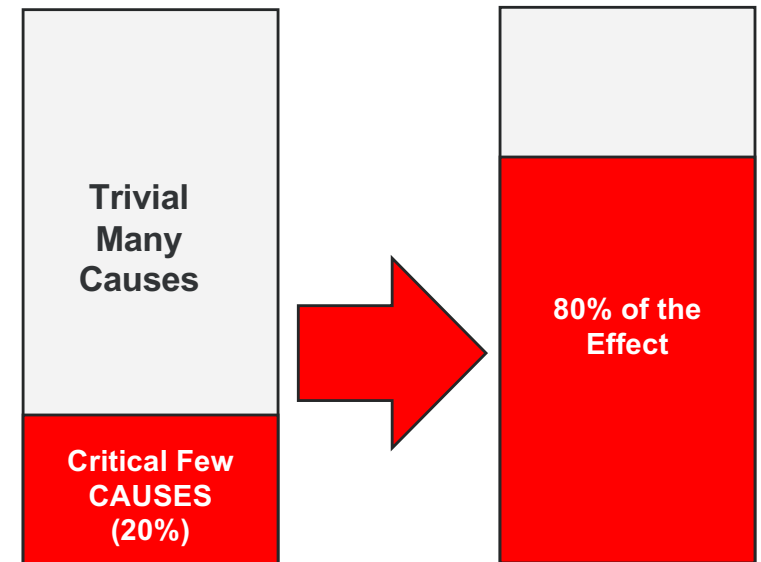
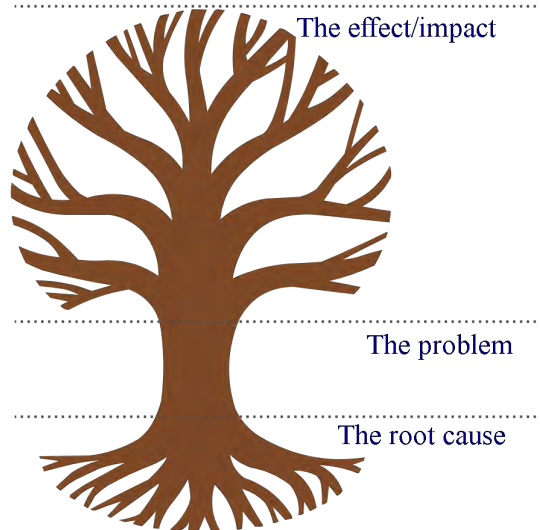




PLAN

“There comes a point when we need to stop just pulling people out of the river. We need to go upstream and find out why they’re falling in.”

Desmond Tutu





Not all countermeasures should be implemented.



Problem Statement



Problem Statement	What is the problem we're trying to solve?
Current Situation	What is happening today? Where is it happening? How much is it happening?
Desired Outcome	What does good look like?

In the US, approximately 29M out of 38M adults with hearing loss are untreated or undertreated; frequently, there is a delay of 10 years or more when addressing hearing loss. It is important to close the gap because hearing loss has been associated with communication difficulties, lower health-related quality of life, and decreased physical and cognitive function.

Goal Statement

Every adult with hearing loss in the US has timely and accurate diagnostic and treatment information required to make an informed decision to optimize their hearing.

By 2032, the adoption % for CI and HA will increase 2X and delay in time to treatment will be reduced





What are the key drivers of the problem we're trying to solve?

1. Fishbone Diagram
2. Prioritize Causes
3. Root Cause Analysis
(Five Why)
4. Countermeasure Go-No Go



Root Cause Analysis

Motivation

Hearing is not a health priority for individuals or

Lack of awareness of importance of hearing to healthy aging

- No physical pain
- Doesn't prevent most daily activities (driving)
- Easy to compensate
- Volume, lip read, text
- Gradual progression
- Patients not aware of long-term impacts
- Not seen as healthcare issue/ annual screening
 - Patients don't know what is normal
 - Professionals do not refer

Patient denial / Stigma

- Stigma with HL
- Hearing loss part of getting "old"
- Hearing aids make you senile or disabled; glasses smart
- Lack of awareness about hearing
- Deeply personal and embarrassing to discuss
- Treatments not valued/appealing
 - Don't cure, Don't work
 - Variable adoption/satisfaction
 - Cosmetics- visible Stigma
 - Fear of surgery
 - Lack of perceived value to treat
 - Not referred by trusted care provider

Diagnosis

No consistent diagnosis for normal or degrees of hearing loss

Inconsistent diagnostic battery

- Many tests available, blunt and inconsistently applied
- Hearing loss is complex and progressive
- Inconsistent approach to diagnostics and recommend treatment
 - No clear guidelines for referrals
- Variable beliefs and evidence on what is effective
 - Lack of trust
- Uncertain evidence on effectiveness
 - Lack of reimbursement
- Lack of evidence-based model to guide affordable hearing care

No universally accepted definition of normal hearing and hearing loss

- Lack of universal metric for hearing health
 - Audiogram is hard to understand
- Hearing loss is perceived differently by patients
- Multifaceted sense and progressive loss
 - Many, inconsistent tests
- No consistent diagnosis that patients understand
 - Audiogram is hard to understand
 - Multiple measures included
 - No tracking over time, pre- and post- treatment
 - No standard way to communicate hearing health
 - Words not conveying the importance to act
 - Poor perceived value of treatment

Identification

Patients don't know if their hearing is "normal"

Patients not aware of hearing

- Take for granted, natural aging
- Hearing loss asymptomatic
- No perceived need or connection to health
 - There is not a standard, easy metric
 - No baseline for comparisons
 - No staging for risk or severity
 - Available self screening tools inconsistent

No mandated adult screening

- Lack of PCP knowledge, time, \$ and poor perception of hearing services
- Not reimbursed
- USPTF didn't recommend
- Uncertain accuracy & effectiveness of tests
- Lack of sufficient level of evidence
 - No consistent metric
 - No definition of normal
 - Risk to patient associated with stigma, labeling and anxiety
- Limited funded research
 - Hearing not considered a priority

Hearing health not adequately reimbursed

Audiology services not adequately

- Some hearing services not or poorly reimbursed
 - Lack of evidence on effectiveness for \$ to support reimbursement
 - Many patients forgo treatment based on out-of-pocket cost / affordability
 - Many services given away setting precedent of low value
 - Not viable to provide unbillable services
 - Service bundled to HA versus separate fee

CI not perceived as profitable

- Variability with HA models that are not covered by traditional Medicare, CI s are covered
- Payer policy complex, vary across beneficiaries/members (incl. MCA)
 - Devices versus service reimbursement
- Clinical model not updated for EB practices that optimize efficiency and reduce unbillable time
- Audiology services including telehealth are not adequately reimbursed
- Lack of incentive to offer CI services in clinical practice leads to low referrals for CI

Lack of perceived value of HA to treat

- Value, cost for benefit not positively perceived
 - Low adoption of HA for mild-moderate HL
 - Easy to compensate
 - Low awareness to healthy aging
 - Patients discontinue treatment, low adherence
 - Price believed to be high/expensive
 - Insurance coverage too low or HA exclusion-retail consumer electronic vs healthcare priority
 - Uncertain what it will cost
 - Lack of price transparency

Lack of price transparency

- Treatment involves multiple care points (dx, tx, devices, maintenance, therapy)
- Difference between CI and HA
- Bundled versus unbundled HA pricing
- Pricing varies
- Consumers uncertain what costs
- Lack of trust in care

Uncertain as to what hearing care will cost

- Variability- HA routinely not covered, for CI routinely covered
- Payer policy complex, vary across beneficiaries/members
- Out of pocket and incidental costs vary
- Can't share accurate info with trusted sources
- Misinformation limits self and HCP referrals

Patients underutilizing the spectrum of treatments for HL

Low adoption of cochlear

- Low referral from HA clinicians
 - Limited or no experience with CI
 - Lack of knowledge on candidacy and effectiveness
 - No guidelines for referral, no consequence of not
 - No relationship with CI center
 - Lack of \$ incentive to refer or offer CI
 - Aud services poorly reimbursed compared to hearing aids, CI not perceived as profitable/viable
- Low referrals within health systems
 - Low awareness of hearing
 - Lack of relationship with CI center
 - Lack of guidelines to base referrals
 - Lack of integration to healthcare/EMR
- Fear/Uncertainty
 - Uncertain outcome
 - Cannot trial or return solution
 - Surgery
 - Affordability / uncertain cost
 - Access to future cures post (pharma)
 - Societal Status- cosmetics more noticeable than HA

Delayed adoption of hearing

- Low referral from PCPS
 - Hearing health not a priority
 - HL maybe asymptomatic/ not problematic
 - Society doesn't value hearing over other health issues
 - Hearing is not life threatening
 - Lack of awareness of hearing and healthy aging
 - Hearing not screened in annual check-ups
 - PCP may suggest hearing aids but not Aud referral
 - Poor perception/trust of audiology care
 - Undervalue need to treat HL
- Low trust in hearing care services
 - Many points of care and provider types
 - Many treatment types to meet variable needs
 - Variable price points
 - Monetary value questionable
 - Variable quality of care and outcomes
 - Patient experience varies
 - Variable regulation
 - Uncertainty as where to go and who to trust for care

Financial

Treatment Path

Counter Measures

Causes

	Simple Metric or Vital Sign	Simple diagnostic reporting	Evidenced based process for referrals
Motivation			
Hearing is not a health priority for individuals or society	X	X	X
Identification			
Patients don't know if their hearing is "normal"	X	X	
Diagnosis			
No consistent diagnosis for normal or degrees of hearing loss	X	X	X
Financial			
Audiology services not adequately reimbursed			X
Lack of perceived value of HA to treat HL	X		
CI not profitable reimbursement in practice			
Treatment			
Low referrals from PCPs for Hearing Care	X	X	X
Low referrals from HA clinicians to CI		X	X



Problem Statement:

In the US, approximately 29M out of 38M adults with hearing loss are untreated or undertreated; frequently, there is a delay of 10 years or more when addressing hearing loss. It is important to close the gap because hearing loss has been associated with communication difficulties, lower health-related quality of life, and decreased physical and cognitive function.

Countermeasures:

1

Develop and embed a simple metric as a **vital sign** for hearing health



2

Develop and embed **simple and consistent reporting** for sensorineural hearing loss that defines appropriate treatment pathways as standards of care



3

Secure **evidence-based procedural change** for timely referral for clinical evaluation and treatment of hearing loss as standard of care



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Countermeasures:

Problem Statements:

Only 20% of primary care physicians routinely screen for hearing loss and <5% refer for diagnostic audiology.

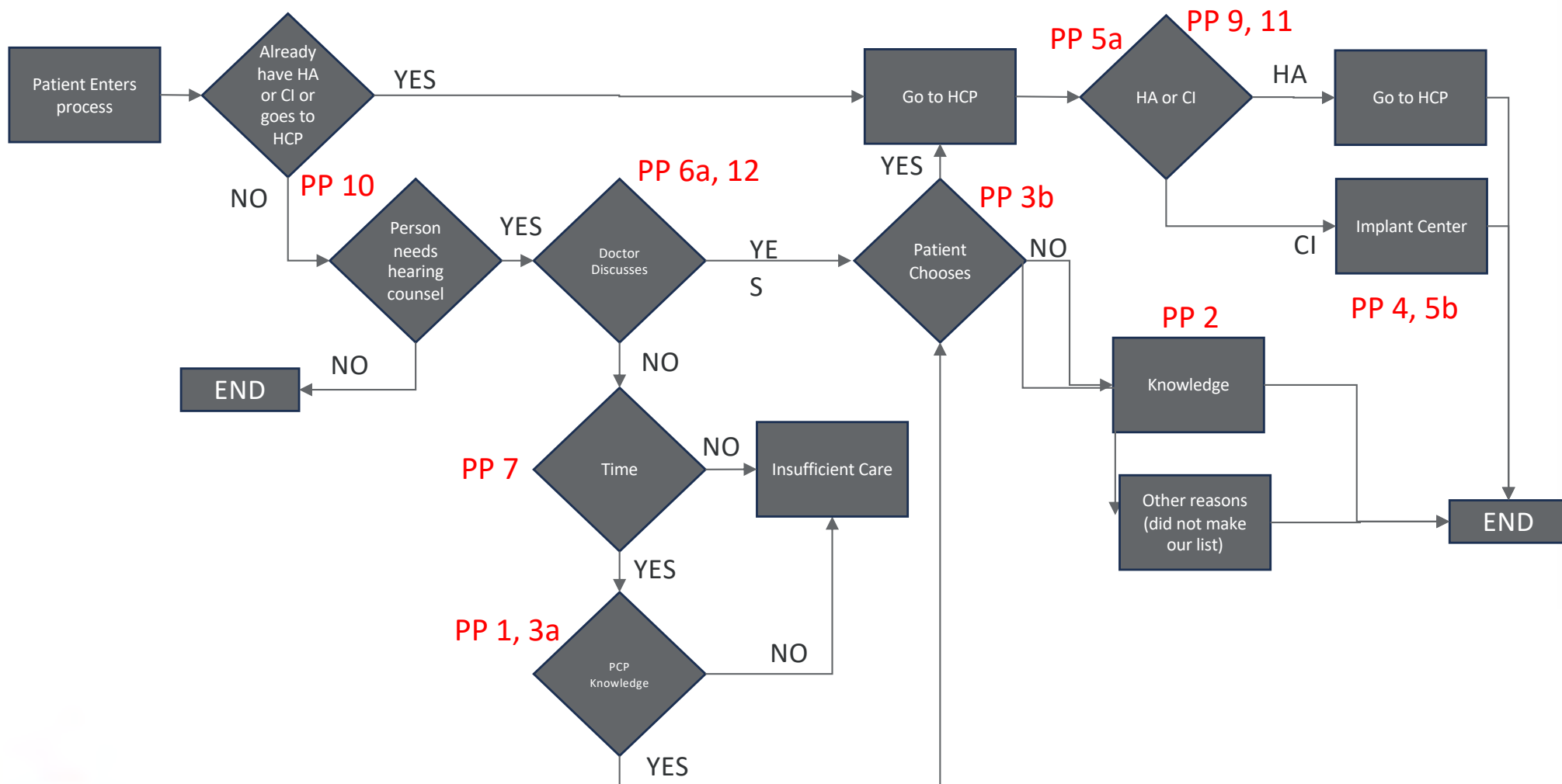
Hearing aid adoption is 25-38% with an average delay of 8.9 years after the onset of HL. HA adoption is lowest among the largest population with HL; i.e., mild to moderate HL.

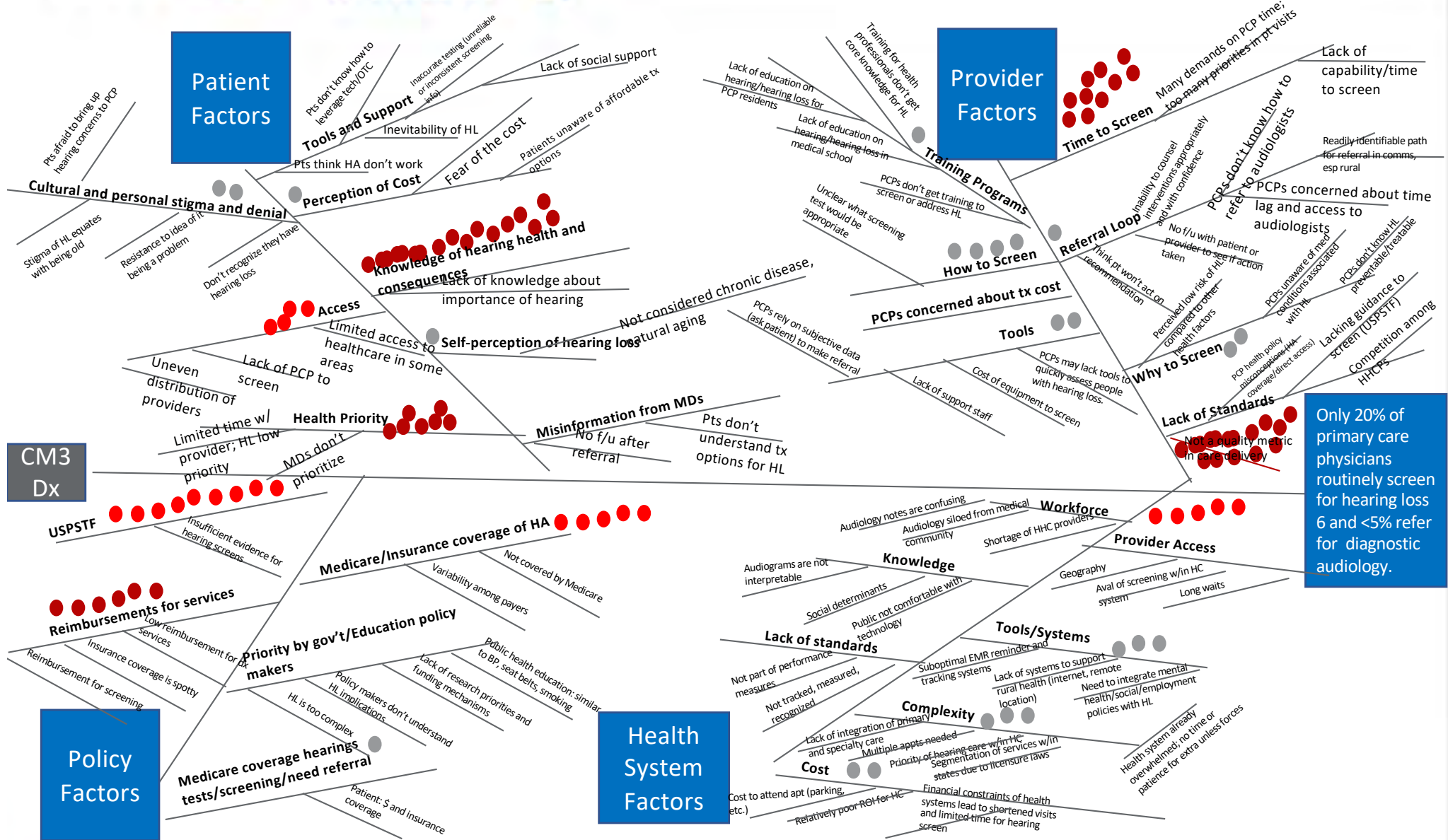
CI utilization is 12.7% for traditional indications and 2.1% for expanded criteria. Professional referral for CI evaluation is low; <3% contributing to a delay in adoption of 10 years.

What are the key drivers of the problem we're trying to solve?

1. Mapped the Process and pain points
2. Fishbone Diagram
3. Prioritize Causes
4. Root Cause Analysis (Five Why)
5. Countermeasure Go-No Go

Point of Occurrence for Prioritized Problems





Impact/Effort Matrix

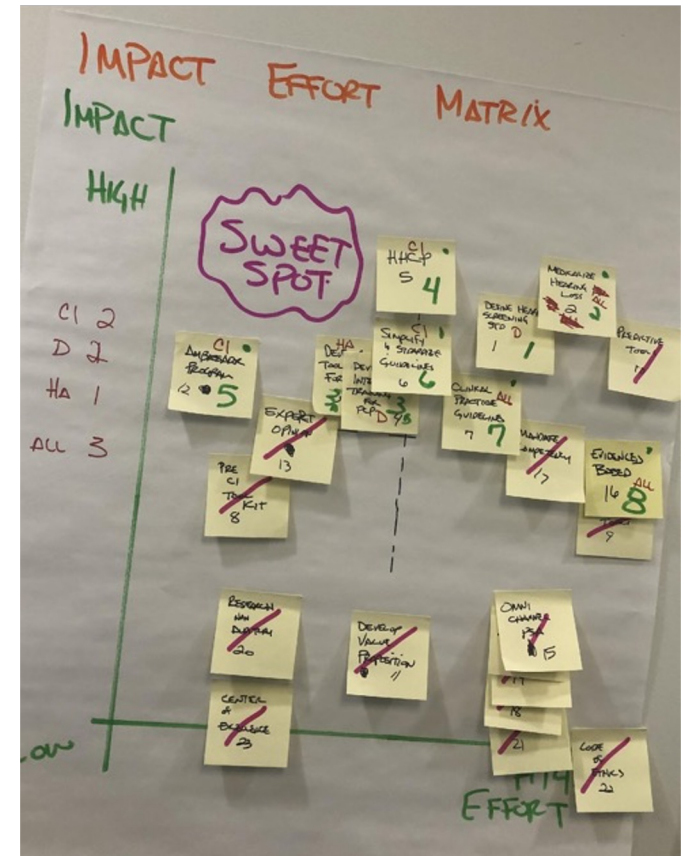
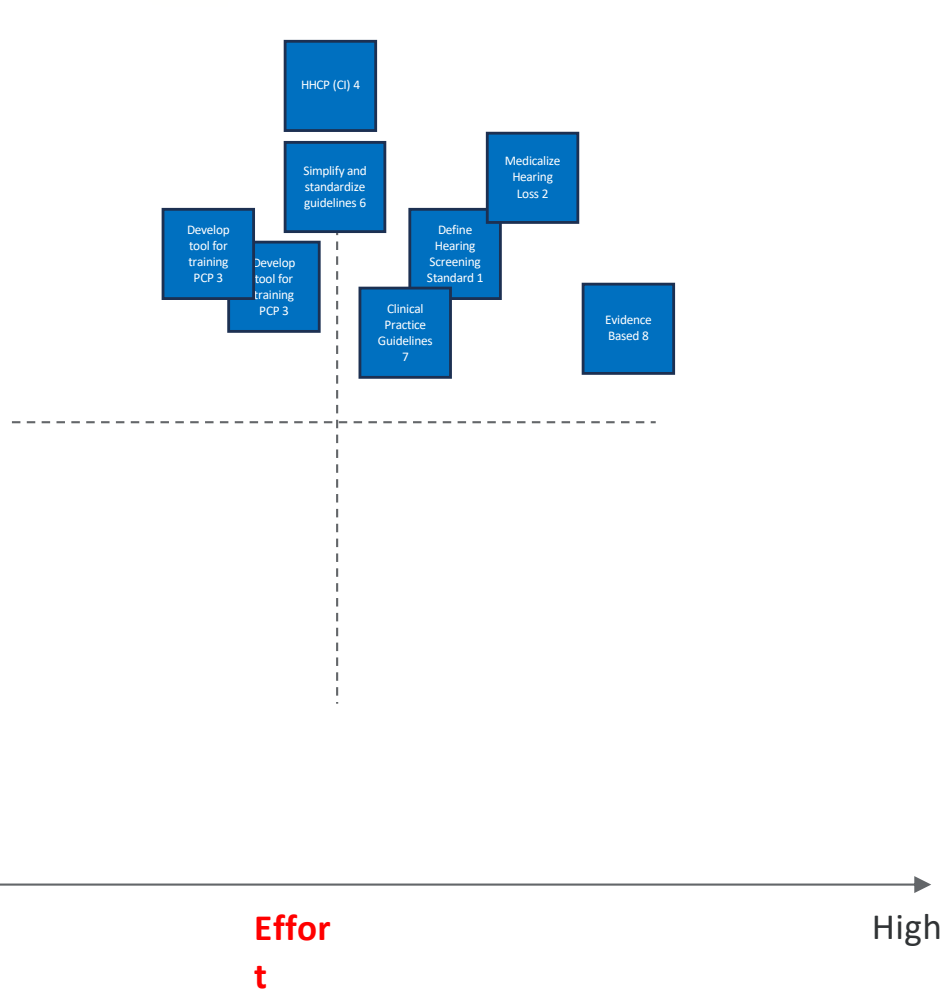
High

Impact

Low

Effort

High



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CI utilization is 12.7% for traditional indications and 2.1% for expanded criteria. Professional referral for CI evaluation is low; <3% contributing to a delay in adoption of 10 years.

Countermeasures:

3a

Define screening standard

3b

Train PCPs

3c

Train PCPs

3d

Increase visibility of outcomes (emotion)

3e

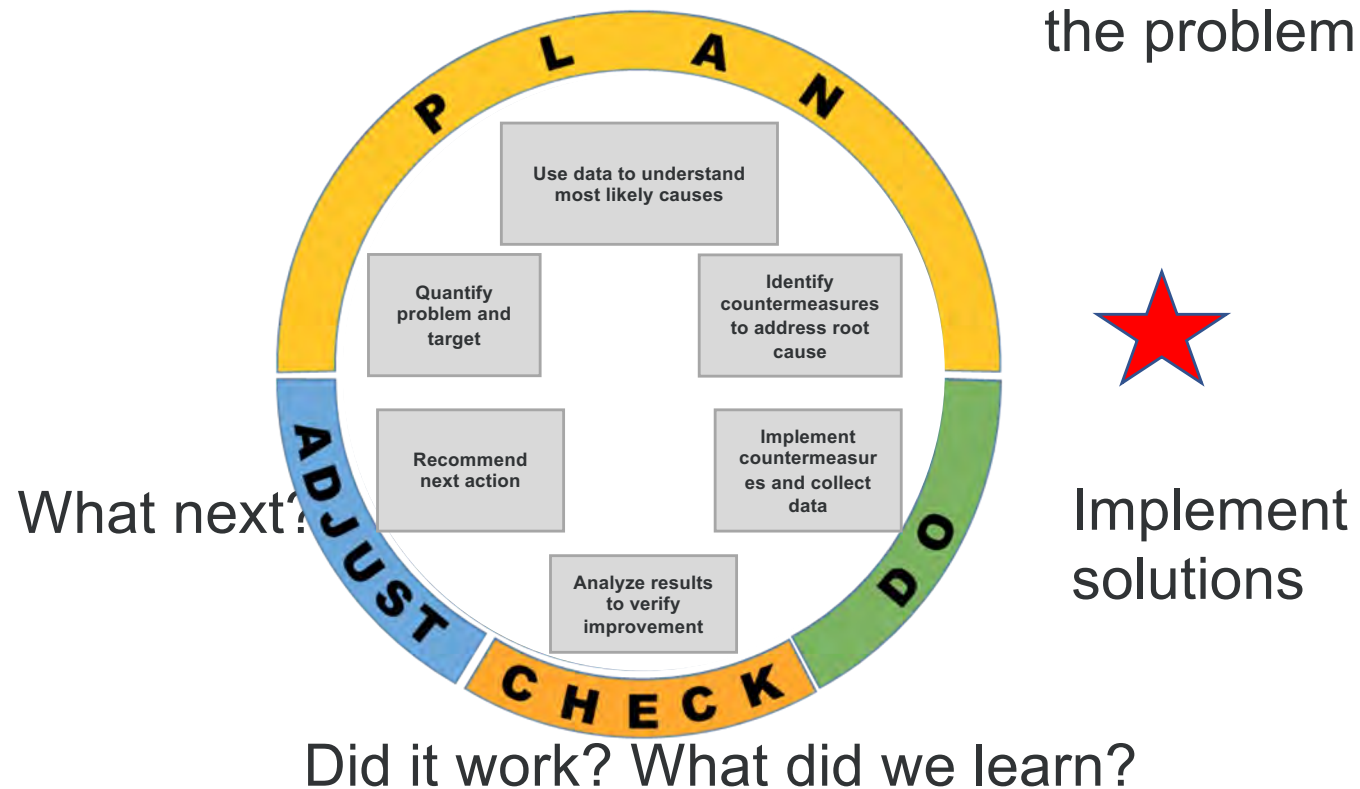
Standardize expectations (logical)

3f

Shape the referral path

“We cannot solve our problems with the same level of thinking that created them.” Albert Einstein

Define and study the problem





Medicalize Hearing



Sensory issue vs. medical condition



Focus on the potential risks from
hearing decline



Mental health



Safety Issues

Proposed Countermeasures

1. Simple metric (“vital sign”) for hearing health

- Develop and embed a simple metric as a vital sign for hearing health

2. Simple and consistent reporting for hearing loss diagnosis

- Develop and embed **simple and consistent reporting** for sensorineural hearing loss that defines appropriate treatment pathways as standards of care

3. Evidence based procedures to support referrals to the continuum of care

- Secure evidence-based procedural change for timely referral for clinical evaluation and treatment of hearing loss as a standard of care

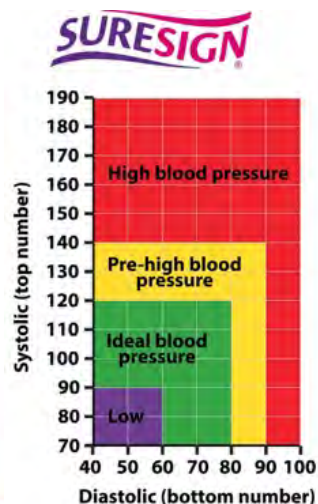
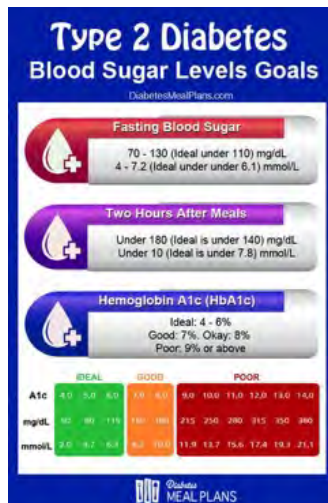


#1

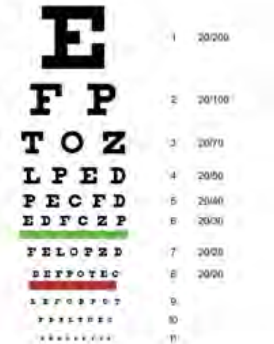
Simple metric
“vital sign” for
hearing health



Countermeasure #1: Simple metric “vital sign” for hearing health



Cholesterol Levels Chart





Commonly Used Health Metrics

Universally understood

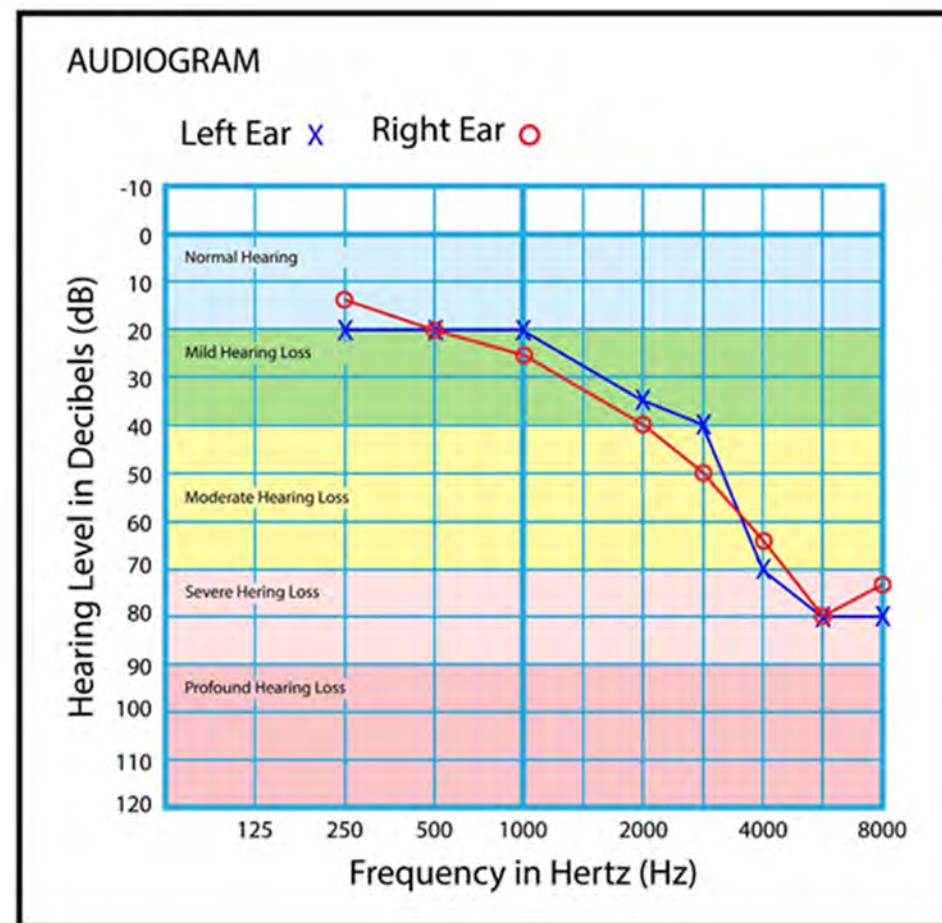
Accessible

Actionable

Clinically meaningful

Current State: Defining Hearing Loss

- Public and other front line HC providers challenged with “degrees of loss”
- Poor interpretation of audiogram meaning



Movement Towards A Hearing Vital Sign



- “Hearing Number”
 - Promoted by the Johns Hopkins Bloomberg School of Public Health (in concert with Mimi Hearing Technologies)
- "Hearing Number App"
- 4-frequency pure tone average (500, 1000, 2000, 4000 Hz)
- Learn more at: <https://hearingnumber.org/>



#2

Simple and
consistent reporting
for hearing loss
diagnosis



Staging Hearing Loss

Creates a common reference point for condition



Allows a reframing of hearing loss as a chronic health condition

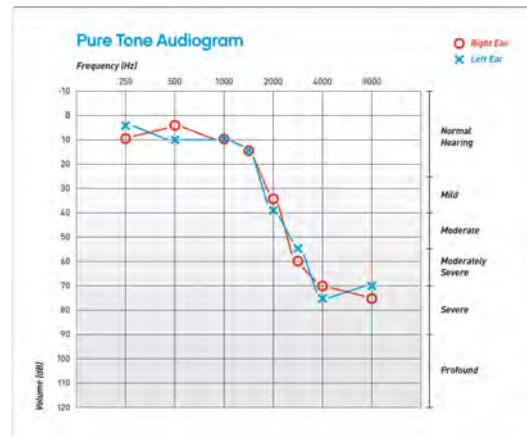
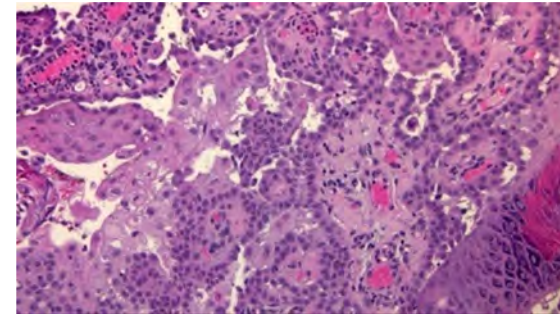
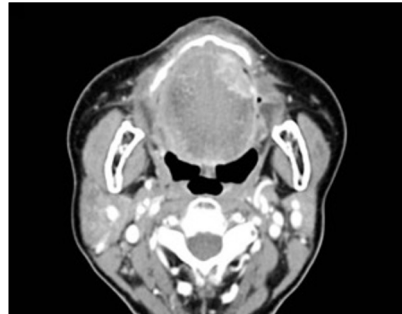


Standardizes common recommendations for PCP's

Diagnostic certainty



Ease of frontline implementation



Stages of Chronic Kidney Disease		GFR*	% of Kidney Function
Stage 1	Kidney damage with normal kidney function	90 or higher	90-100%
Stage 2	Kidney damage with mild loss of kidney function	89 to 60	60-89%
Stage 3a	Mild to moderate loss of kidney function	59 to 45	45-59%
Stage 3b	Moderate to severe loss of kidney function	44 to 30	30-44%
Stage 4	Severe loss of kidney function	29 to 15	15-29%
Stage 5	Kidney failure	Less than 15	Less than 15%

*Your GFR number tells you how much kidney function you have. As kidney disease gets worse, the GFR number goes down.

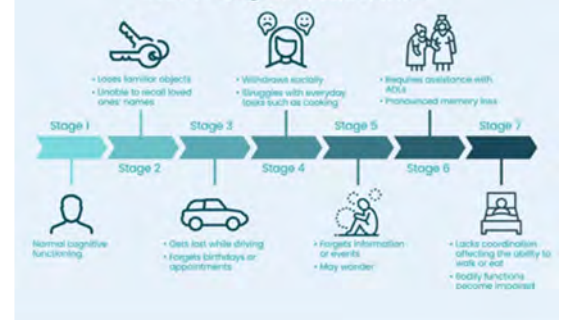
THE STAGES OF BREAST CANCER



	Early PD		Mid-stage PD	Advanced PD	
Stage of Parkinson's Disease	1	2	3	4	5
Severity of Symptoms	MILD Symptoms of PD are mild and only seen on one side of the body (unilateral involvement)	MILD Symptoms of PD on both sides of the body (bilateral involvement) or at the midline	MODERATE Symptoms of PD are characterized by loss of balance and slowness of movement	SEVERE Symptoms of PD are severely disabling	SEVERE Symptoms of PD are severe and are characterized by an inability to rise
	SYMPTOMS Tremor of one hand Rigidity Clumsy Leg One side of the face may be affected, impacting the expression	SYMPTOMS Loss of facial expression on both sides Decreased blinking Speech abnormalities Rigidity of the muscles in the trunk	SYMPTOMS Balance is compromised Inability to make the rapid, automatic and involuntary adjustments All other symptoms of PD are present	SYMPTOMS Patients may be able to walk and stand unassisted, but they are noticeably incapacitated Patient is unable to live an independent life and needs assistance	SYMPTOMS Patients fall when standing or turning May freeze or stumble when walking Hallucinations or delusions.

PD ParkinsonDisease.net / Stages of Parkinson's Disease

The 7 Stages of Dementia



Congestive Heart Failure

Stages

Stage	Severity	Definition
Stage A	At Risk	At risk of heart failure but with no structural disease or symptoms of heart failure
Stage B	Pre-HF	Structural heart disease is present but without symptoms of heart failure
Stage C	HF	Structural heart disease and symptoms of heart failure present
Stage D	Advanced HF	Severe refractory heart failure

Current Descriptors for Hearing

Category	Pure-tone audiometry ^{a,b}	Hearing experience in a quiet environment	Hearing experience in a noisy environment
Normal hearing	–10.0 to 4.9 dB hearing level 5.0 to 19.9 dB hearing level	Excellent hearing Good hearing	Good hearing Rarely have difficulty in following/ taking part in a conversation
Mild hearing loss	20.0 to 34.9 dB hearing level	Does not have problems hearing what is said	May have real difficulty following/ taking part in a conversation
Moderate hearing loss	35.0 to 49.9 dB hearing level	May have difficulty hearing a normal voice	Has difficulty hearing and taking part in conversation
Moderately severe hearing loss	50.0 to 64.9 dB hearing level	Can hear loud speech	Has great difficulty hearing and taking part in conversation
Severe hearing loss	65.0 to 79.9 dB hearing level	Can hear loud speech directly in one's ear	Has very great difficulty hearing and taking part in conversation
Profound hearing loss	80.0 to 94.9 dB hearing level	Has great difficult hearing	Cannot hear any speech
Complete or total hearing loss	95.0 dB hearing level or greater	Profoundly deaf, hears no speech or loud sounds	Cannot hear any speech or sound
Unilateral	< 20.0 dB hearing level in the better ear, 35.0 dB hearing level or greater in the worse ear	Does not have problems unless sound is near poorer hearing ear	May have real difficulty following/ taking part in a conversation

dB: decibel; Hz:Hertz

^a In the better ear.

^b Average of 500, 1000, 2000 and 4000 Hz.

Source: Global Burden of Disease Expert Group on Hearing Loss.⁷



Staging System Goals

Include broader healthcare - PCPs (family medicine, internists, geriatricians)

Must be simple, easy to understand, and integrated in EMR

Should support referrals for appropriate advanced diagnostic and management

Must align to vital sign countermeasure

Support view of HL as chronic disease that can be managed appropriately





Next Steps for Countermeasure 1 & 2



CONTINUE
PROCESS FOR
ACQUIRING
SUPPORT



ENGAGE
OUTCOMES
RESEARCH
TEAM



COMPLETE
COMPREHENSIVE
SYSTEMATIC
REVIEW

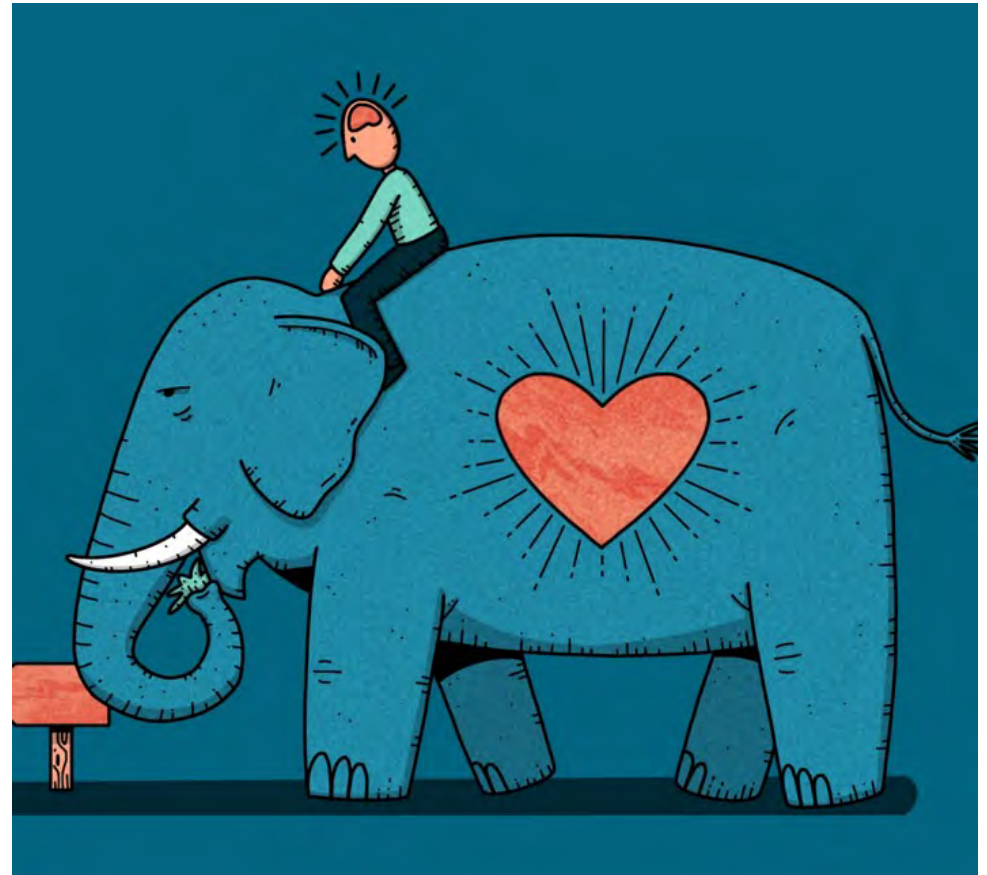


#3

Evidence based
procedures to support
referrals to the
continuum of care

Path forward...

- Increase visibility of outcomes (emotion)
- Standardize expectations (logical)
- Shape and simplify the referral pathway



Next Steps for Counter Measure 3



Create and Endorsed
Screening Standard



Train PCPs to identify
Hearing Loss and Refer for
Treatment



Optimize Change
Management for Cochlear
Implants



Necessary Investment



Engagement of additional disciplines and stakeholders



Endorsements of multiple societies and agencies



Financial catalyst



Questions

