



# Excellence Award

**NORTHROP  
GRUMMAN**

2022



# St. Augustine Site

## Site Features

- 8,000 ft. of shared runway with North Florida Regional Airport
- 151 acres, 38 buildings and 1.1 million square feet of office, manufacturing, lab, and warehouse space
- Production Capabilities
- Agile, low-cost aircraft development, production and flight test
- Aircraft depot-level maintenance, MRO
- Fabrication and assembly of aircraft structures, replacement spares and subassemblies
- Environmental friendly removal and application of paint and coatings
- State-of-the-art systems and processes for managing all phases from design and development to production and support



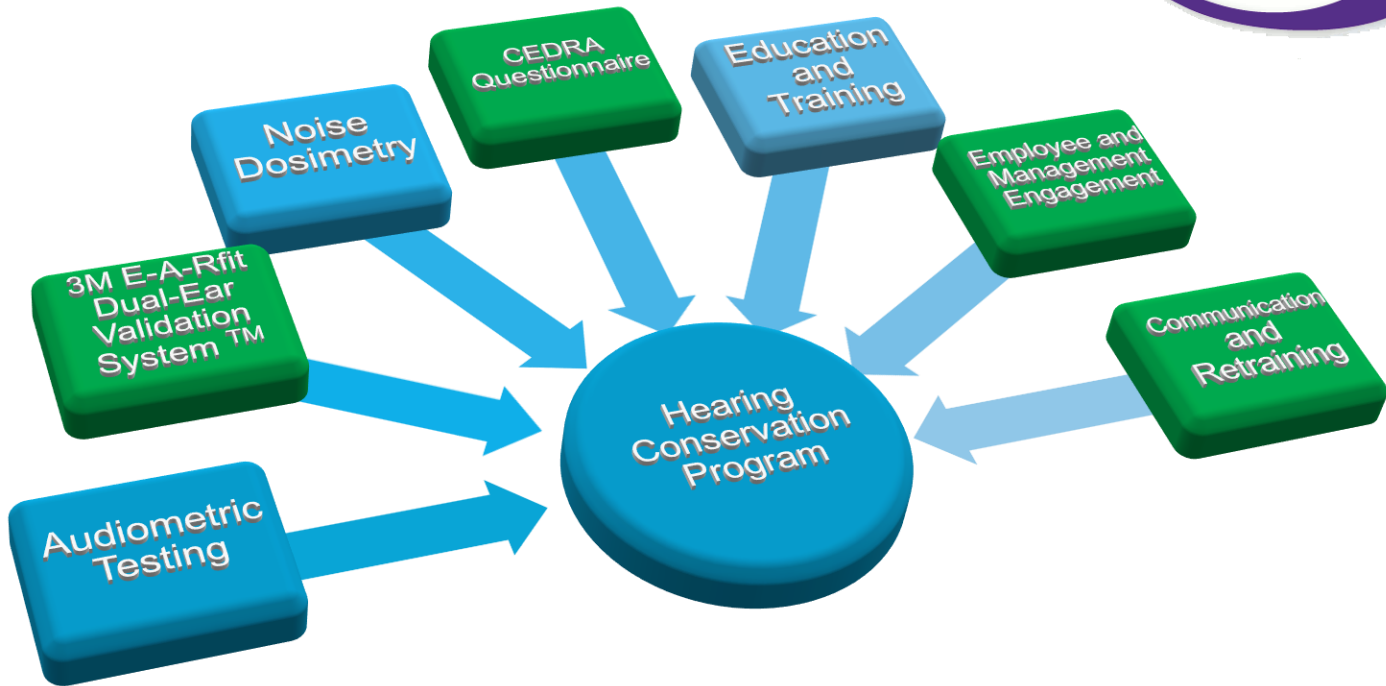
Great team of employees providing quality products to our warfighter

# St. Augustine Environmental, Safety, and Health Team



Left to Right: Adrian Brown P.E., Tami Hays R.N., Julie Edwards Manager, Gina Williams Safety Coordinator, Quinn Soudrette R.N., Javier Garcia ESHM Engineer, Gavin Murray Sr. Principal ESHM Engineer, Dr. James Hall Audiologist (not shown)

# Program Elements



These differentiate us

## Audiograms



## Ear-Fit Validation Testing



- Baseline for new hires
- Annual Testing for Hearing Conservation Program Participants
- Education on hearing loss prevention and personal attributes that may accelerate hearing loss.

# Beyond the Basics

## Comprehensive Hearing Test Report

Hearing Conservation Program: OSHA		Recent Test: 10/14/2021		Time: 14:15	
STS:	Age Correction: Yes Separate Baselines: Yes	STS Left: STS Right:	No No	No STS Indicated No STS Indicated	
Recordable: (10 dB)	Age Correction: Yes Separate Baselines: Yes	Recordable Left: Recordable Right:	No No	No Recordable Indicated No Recordable Indicated	
Referrals:	Questions: No information available		No None		
Impairment:	Formula: AAO 1979 FORMULA		Left: 0.0 %	Right: 0.0 %	Total: 0.0 %
Classification:	5,1,2k Avg 5,1,2,3k Avg 2,3,4k Avg 4,6,8k Avg		Low (5,1,2,3K Hz)	Mid (2,3,4k Hz)	High (4,6,8K Hz)
Left Ear:	5.0	3.8	0.0	5.0	Normal
Right Ear:	6.7	6.3	15.0	18.3	Normal Mostly Normal Mostly Normal
Location: Northrop Grumman - St. Augustine, FL					
Department: (No Department Has Been Selected)			Job: (No Job Has Been Selected)		
Work Shift:					
Birth Date: 08/01/1984		Age: 37		Gender: Male	
Status: Active			Hired: / /		
Tested By: Unknown					
Audiometer: Earscan 3 Earscan 3 SN: 01030300048B					
Calibrated: 1/29/2021					

## Consumer Ear Disease Risk Assessment

Consumer Ear Disease Risk Assessment (CEDRA)

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This questionnaire is designed to help you decide if you need to see a doctor before obtaining a hearing device. If you have any medical questions or concerns about your hearing, you should see a doctor no matter what your score is on this questionnaire.

### Questions about your Ears and Hearing

Circle "Yes" or "No"

- When talking on a telephone, do you understand what people say better in one ear than the other?
- Did the hearing loss in either of your ears develop suddenly?
- Have you ever had a sudden permanent change in your hearing?
- Do you have hearing loss in only one ear?
- Do you hear better in one ear than the other?
- Does your hearing change from day to day?
- As an adult, have you ever had more than one infection in the same ear during one year?
- Have you ever noticed pus, blood or other active fluid discharge from your ear?
- Have you ever been told by a physician that you have Meniere's disease?

Yes	No
Yes	No
Yes	No
Yes	No
Yes	No
Yes	No
Yes	No
Yes	No
Yes	No

10. Overall, how would you rate your health?

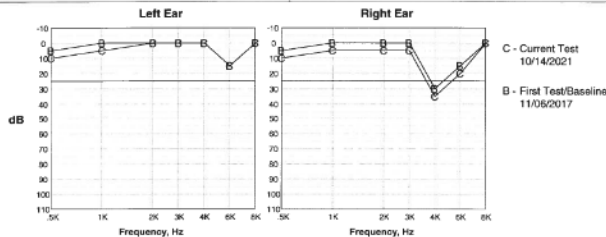
- Very good  
 Good  
 Poor  
 Very poor

11. How often do you have dizziness?

- Never  
 Occasionally  
 Frequently  
 Always

12. How would you rate your balance?

- Very good  
 Good  
 Poor  
 Very poor



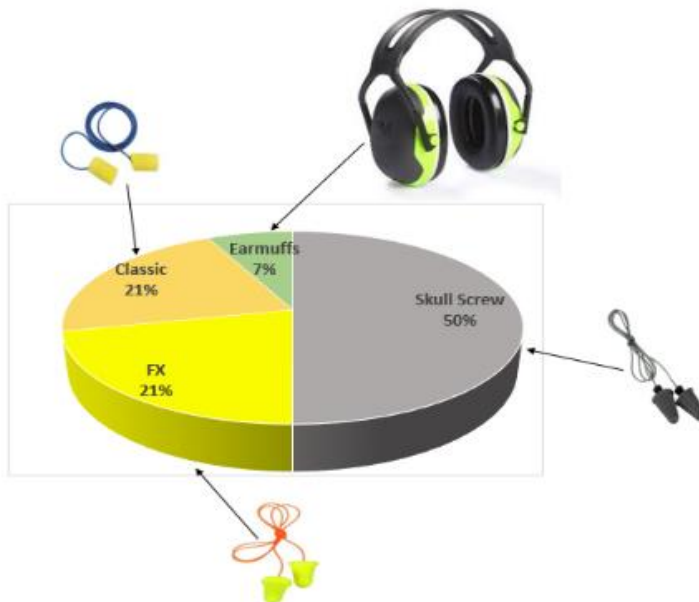
Time	Left Baselines						Right Baselines						STS	Log LI	LI	RT	Lz	Rz	Age
	5k	1k	2k	3k	4k	6k	5k	1k	2k	3k	4k	6k							
10/14/2021	1415	10	5	0	0	15	0	10	5	5	35	20	0	-1.7	3.3	0.0	5.0	37	
09/10/2020	0947	10	5	0	0	10	5	10	5	5	35	15	0	-1.3	3.7	0.0	5.0	36	
10/22/2019	1558	5	0	0	0	5	0	5	0	5	30	10	0	-0.7	1.0	0.0	1.7	35	
11/06/2017	1142	5	0	0	0	15	0	5	0	0	30	15	0	0.0	0.0	0.0	0.0	33	

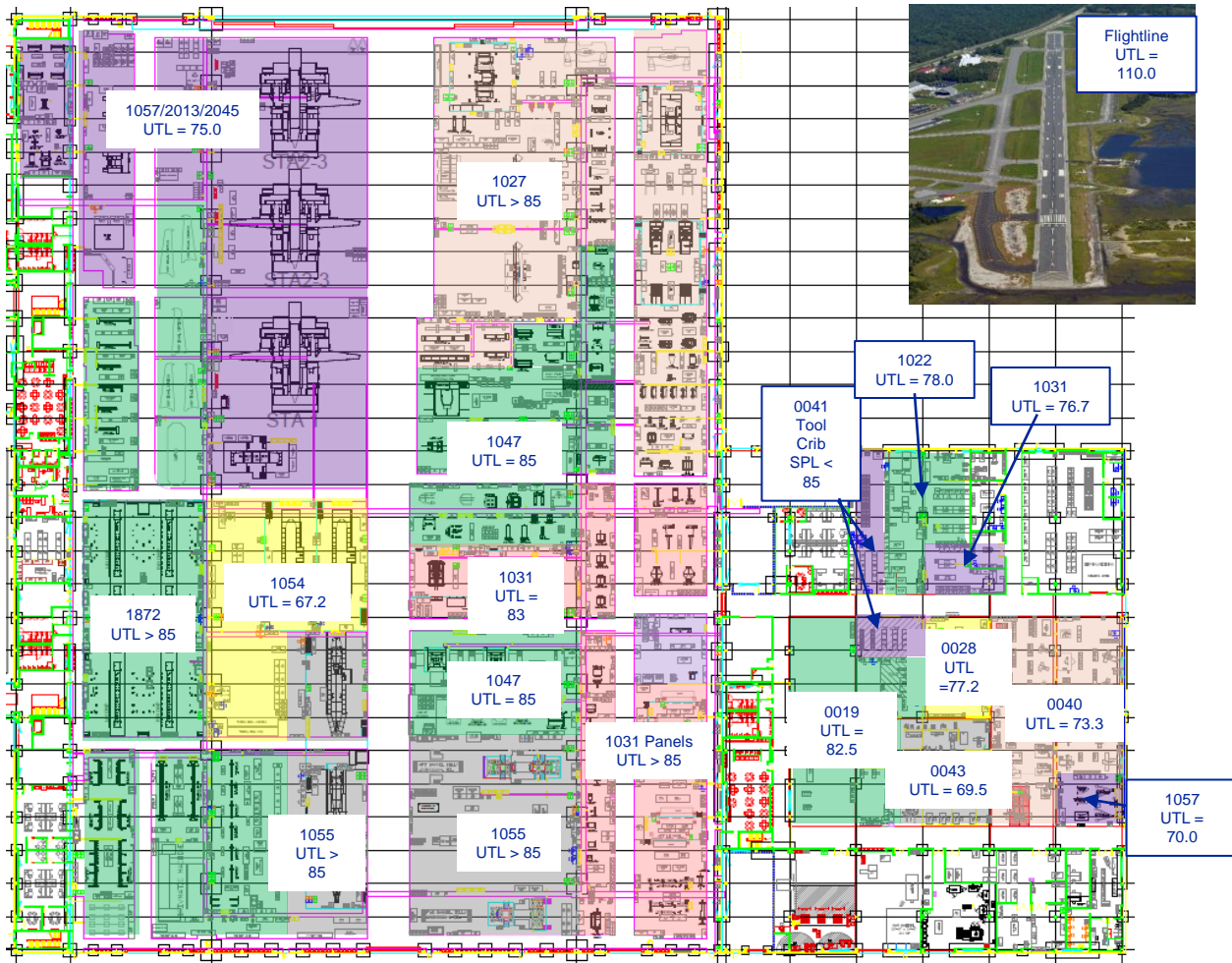
# One Department's Hearing Protection Selection Based on E-A-Rfit Testing

- Hearing Protection is not one size fits all. We provide employees choices
- Departments may use hearing protection based on the tasks, testing, and noise exposure
- All hearing PPE is provided by the employer whether you are a visitor, contractor, or full time employee

**Percentage of Hearing Protection Devices Being Utilized**

<i>Brand Name of Hearing Protection Device</i>	<i>Number of Employees Using Device</i>	<i>% of Use</i>
Skull Screw	7	50%
FX	3	21%
Classic	3	21%
Earmuffs	1	7%

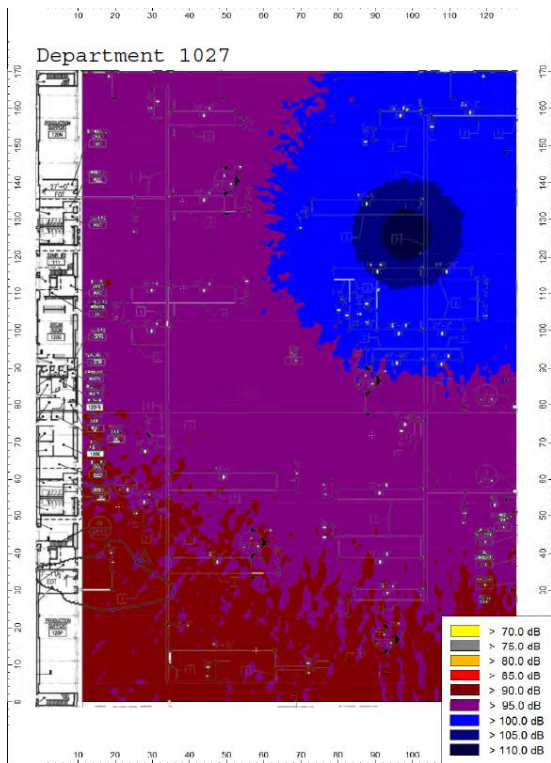




Main Manufacturing Hangar UTL Values by HEG



# Research, Deploy, and Try Again



Hi-Tigue riveting was modeled before moving into our new building in 2015

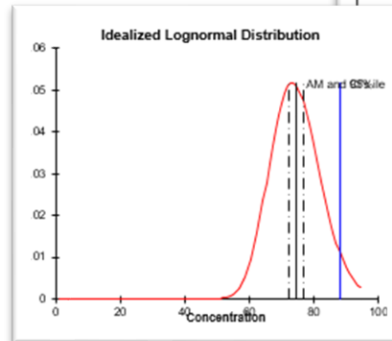
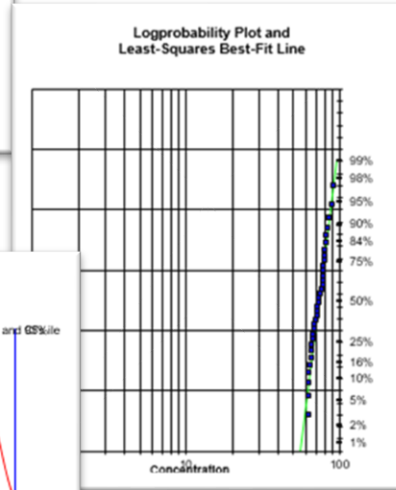
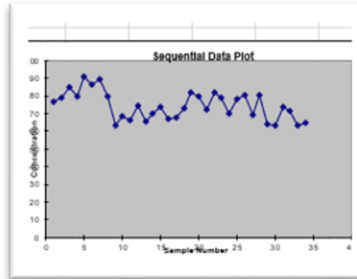
Noise sources from other departments did not impact the entire building, so no need for a building-wide alert system



Modeling did not reflect actual once occupied

# Homogenous Exposure Groups

<b>Industrial Hygiene Statistics</b>		
Data Description: Dept 1872 Outer Wing Panel Box Beam		
<b>OEL</b>	<b>DESCRIPTIVE STATISTICS</b>	
85	Number of samples (n)	34
	Maximum (max)	91
	Minimum (min)	63
	Range	28
	Percent above OEL (%>OEL)	11.765
	Mean	74.400
	Median	73.850
	Standard deviation (s)	7.831
	Mean of logtransformed data (LN)	4.304
	Std. deviation of logtransformed data (LN)	0.105
	Geometric mean (GM)	74.005
	Geometric standard deviation (GSD)	1.110
	<b>TEST FOR DISTRIBUTION FIT</b>	
	W-test of logtransformed data (LN)	0.952
	Lognormal (a = 0.05)?	Yes
	W-test of data	0.949
	Normal (a = 0.05)?	Yes
	<b>LOGNORMAL PARAMETRIC STATISTICS</b>	
	Estimated Arithmetic Mean - MVUE	74.399
	LCL <sub>1,95%</sub> - Land's "Exact"	72.212
	UCL <sub>1,95%</sub> - Land's "Exact"	76.736
	<b>95th Percentile</b>	87.900
	UTL <sub>95%,95%</sub>	92.928
	<b>Percent above OEL (%&gt;OEL)</b>	9.270
	LCL <sub>1,95%</sub> %>OEL	4.394
	UCL <sub>1,95%</sub> %>OEL	17.649
	<b>NORMAL PARAMETRIC STATISTICS</b>	
	Mean	74.400
	LCL <sub>1,95%</sub> - t statistics	72.127
	UCL <sub>1,95%</sub> - t statistics	76.673
	<b>95th Percentile - Z</b>	87.283
	UTL <sub>95%,95%</sub>	91.45
	<b>Percent above OEL (%&gt;OEL)</b>	8.794



Noise exposure varies during the build cycle

# Front Line Manager Support

July 15, 2021



Northrop Grumman  
2001 Fairview Park Drive  
Falls Church, Virginia 22042-4511  
northropgrumman.com

Dear Submission Team

I would like to provide my endorsement of the effort Northrop Grumman has put in place to support the protection of our employees' hearing through safety best practices. I believe Northrop Grumman has one of the leading Hearing Conservation Programs in the industry. The company performs the normal hearing test and provides 3M ear fit-dual validation tests to personalize earplug selection for employees. This test allows the employee to choose what suits them best to protect their hearing while performing specific tasks. The 3M test allows you to test the actual ear protection and see how well it performs to your specific personal liking. The education and consistent health, medical and safety support Northrop Grumman provides follow employees and me is what makes this company stand out as a leader.

Thanks

Chaz

Chaz Thome  
Manager, General Manufacturing  
O 904-810-4573  
5000 US 1 North  
St. Augustine, FL 32095



Northrop Grumman Corporation  
5000 US 1 North  
St. Augustine, FL 32095

July 1, 2021

To Safe-in-Sound Committee:

As an aircraft production manager with Northrop Grumman, I have many responsibilities, including supporting the health and welfare of my employees. Just as important to our mission of maintaining the highest quality of workmanship in the military bound aircraft that we proudly build, the health of our employees is also important. Our employees rely on the partnership between management and the on-site medical team to aid in preventing hearing loss due to loud noises in the workplace.

My employees use pneumatic riveting tools to secure metal aircraft parts in place via high strength fasteners, which create a lot of noise. Ensuring that the right hearing protection is worn, as well as the close monitoring of high risk employees who are trending toward a decrease in their hearing, is essential. Because of this monitoring, the medical team was able to alert several of my employees to negative trending that was occurring with their hearing, and address these concerns through retraining, hearing protection device refitting, and evaluation of their current use practices.

I feel that these early intervention practices have provided my employees with the assistance, guidance, and resources that they need in order to protect their hearing before they experience any changes in their hearing ability.

Sincerely,



M. Mose Countryman  
Manager General Manufacturing

“These people are my friends and I want them to be safe”

- Phil Scala, Sr. Manufacturing Engineer

# Engaged Workforce in Safe Work Practices



# Assessing Hearing Results in one Department Includes Retraining

Determining If Employee Is Maintaining Their Current Level Of Hearing

EMPLOYEE	Employee hearing results show good hearing protection & practices	Employee <u>trending</u> toward negative shift in their hearing; re-evaluate their current practices to stop progression toward permanent shift	Employee has experienced a negative change in their hearing level that warrants retraining & refitting of hearing protection
Mike	Yes		
Tracey	Yes		
Trey	Yes		
Brad	Yes		
Jeremy	Yes		
Matt	Yes		
Justin		Yes ★	
Joseph	Yes		
Lucas	Yes		
Allen		Yes ★	
Tom	Yes		
Karissa	Yes		
Norman	Yes		
Jason	Yes		
★ Denotes received re-training/re-fitting			



# Example Letter

- Example letters produced and discussed with respective employee (total of 5 for 2020).
- Standard threshold shift/s were discussed with emphasis on hearing protection device re-training, as well as education regarding the effects of accumulative noise on individual's hearing.

NORTHROP  
GRUMMAN

St. Augustine Aircraft Integration Center of Excellence  
Medical Clinic  
5000 U.S. 1 North  
St. Augustine, Florida 32095

January 7, 2021

Hello Employee X-

Your audiogram results from your hearing test that we conducted in the Medical Clinic in October, 2020 have been reviewed by Dr. James Hall, Audiology Supervisor, with the following finding/s.

A standard threshold shift in your hearing was confirmed in your left ear, which indicates a possible hearing loss is present in that ear for sounds associated with speech and conversation. This change in your hearing level for your left ear may be the result of an unidentified medical condition, or a non-work place noise exposure/activity.

Your current choice of a hearing protection device/s offers you excellent hearing protection. Continue to wear your hearing protection when exposed to loud noise, whether at home or on the job. If you decide to change the hearing protection device/s that was approved by the Medical Clinic for your use while at work, please contact us immediately so that we may retest you to determine if it affords you proper hearing protection.

It is recommended that you seek a referral to an audiologist for diagnostic assessment to rule out causes for left ear hearing loss that includes otoacoustic emissions testing and evaluation of speech perception in noise. It would be beneficial if your assessment included recommendations for amplification (hearing aid) as well.

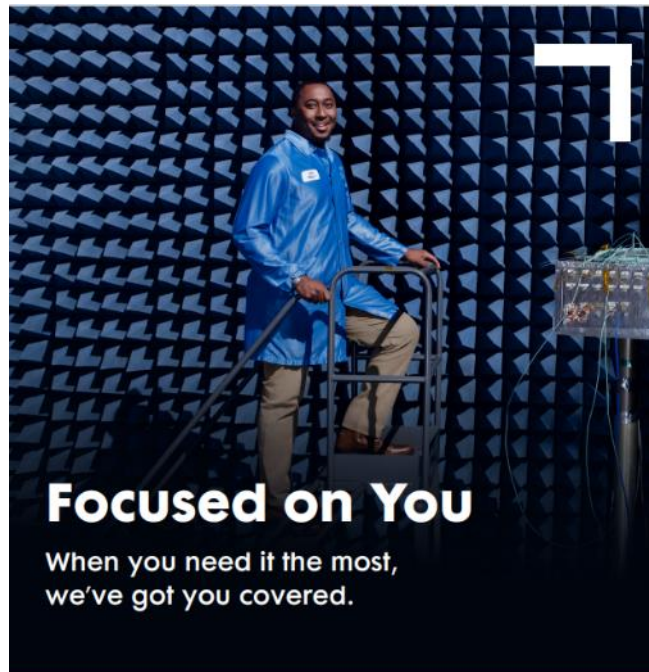
Regards,

D. Quinn Soudrette, RN

Providing recommendations and follow-up to those who shift (e.g., otoacoustic emissions, neural auditory function, acoustic reflex threshold/decay, etc.)

# Corporate Wellness

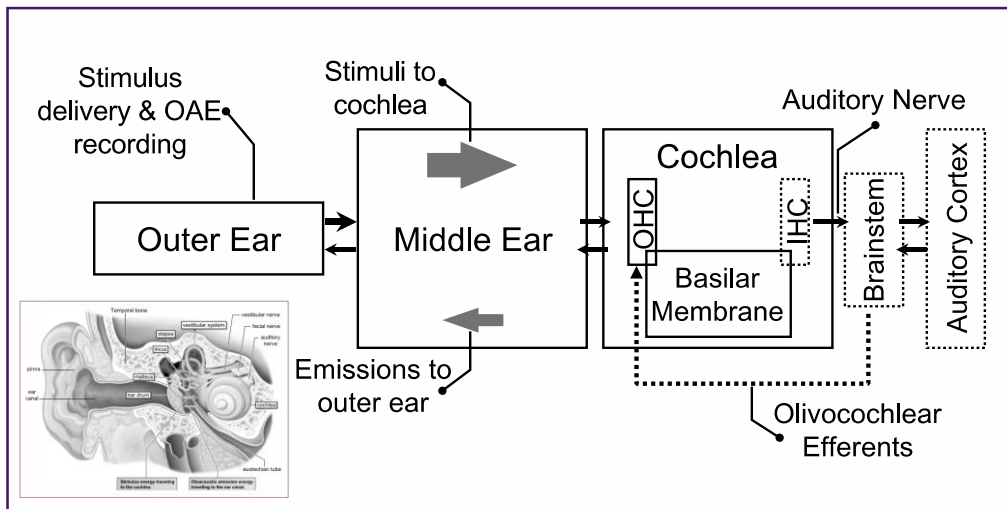
- Corporate Wellness promotes best practices for health by providing services for
- Diabetes management,
- Smoking cessation,
- Weight loss, and more
- All these resources also promote hearing conservation





# Early Detection of Noise-Induced Hearing Loss: Key to Successful Hearing Conservation

## Distortion Product Otoacoustic Emissions (DPOAEs)



**FIGURE 1–4.** A simple block schematic of the major regions of the auditory system that influence the measurement of otoacoustic emissions. Note the directional arrows in the middle ear depicting the bidirectional energy transfer through this space. The size of the arrows is representative of the relative magnitudes of the energy traveling into and out of the cochlea. Structures outlined in dashed lines play a secondary role in modulating OAEs.

# LOOKING TO THE FUTURE

- You can never provide enough training
- Increasing the early detection of ear disease
- Excellence in our commitment to the warfighter begins with our employees, whom some are veterans that become part of our workforce. The mission is to protect and serve everyone's hearing and reduce, detect and educate any predetermined conditions.

# NORTHROP GRUMMAN



Excited about our Hearing Conservation  
and our Site's success – **THANK YOU**

Julie Edwards  
Environmental, Health, Safety  
and Medical Manager  
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904.825.3536

