

# Fish Consumption for Clinicians

Increasing Knowledge of the Risks and Benefits of Fish  
and  
Evaluating Clinical Screening for Mercury

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# Acknowledgements/Disclosure

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How to utilize the healthcare provider to decrease exposure to methyl mercury from fish?

A. Educate clinicians about risks and benefits of fish consumption

B. Provide patient education/counseling

C. Implement screening?

# Background: Health Behavior Change

- Evidence shows:
  - Patients look to their primary care providers (PCPs) as sources of prevention recommendations
  - Brief interventions integrated into routine primary care can reduce risk behaviors

Whitlock et al. Am J Prev Med 2002

# Background: Healthcare provider education

## Adult learning techniques that are:

- Interactive
- Sequential
- Held in settings such as workshops, small groups, individual training sessions

## **WORK BETTER TO CHANGE PROVIDER BEHAVIOR**

Whitlock et al. Am J Prev Med 2002



- On-line CME course
- Six 30-minute modules delivered every 2 weeks
- Repeated short bursts of information, interactive
- Pre-test for each module evaluates knowledge from previous module
- Participants required to make Action Plan for clinical practice
- Actions Plans posted on Discussion Board

# Summary messages

**Module 1:** the four(five) fish to avoid

**Module 2:** eat fish twice per week

**Module 3:** eat a variety of fish

**Module 4:** advise special populations re: species  
that are lower in contaminants

**Module 5:** access local fish advisories for sport  
anglers

**Module 6:** balance risks and benefits



<b>Module</b>	<b>Knowledge</b>	<b>Behaviors</b>	<b>Tools (Skills)</b>
Module 1	1. How contaminants get into fish—Hg, PCBs, chlordane, DDT 2. Mercury concentrates in larger fish 3. Major benefits of PUFAs for fetus/pregnancy/infants: neurodevelopment, etc. 4. Major risks of organic mercury in pregnancy/infants: neurodev, etc 5. The four fish to avoid. <i>Case: pregnant woman craving swordfish</i>	Ask patients (child’s parents) about consumption of the four fish to avoid Advise against intake of the big four	Script for asking about the four types of fish to avoid. Advice to avoid them.
Module 2	1. Major benefits of PUFAs for adults 2. Major risks of organic mercury and PCBs in adults 3. Non-fish sources of PUFAs 3. A variety of fish, two meals per week. <i>Case: adult with heart disease – screening for eating enough</i>	Ask all patients about frequency of fish consumption. Advise re: eat fish, two meals per week.	Script for asking about frequency of fish consumption. Advise re: eat fish twice per week. Access AHA recommendations
Module 3	1. DHA intake recommendations in pregnancy 2. Mother-baby pathway (placenta), why children are special pops 3. Detail on risks and benefits of fish in pregnancy/childhood –expanded from Module 1. <i>Case: child who eats only tuna sandwiches</i>	Ask patients (child’s parents) about frequency of fish consumption. Encourage pts. to eat fish, reinforce avoiding the big four, eat a variety twice a week, do not stick to one fish.	Script on screening for frequency of fish consumption, encouraging to eat fish, reinforce the big four, eat a variety twice a week.
Module 4	Special populations at risk besides pregnant women and babies Asian pops, tribal pops Review absorption of mercury, ½ life Tables of mercury levels in various species  <i>Case: Asian adult – eating too much and feeding grandchildren</i>	Know the ethnic groups that may be at higher risk.	Script – Screen high risk populations. Access information on mercury levels in fish
Module 5	Great Lakes PCBs, pesticides and other contaminants Introduction to local fish advisories <i>Case: Urban angler</i>	Screen pts about locally caught fish	How to access local fish advisories Add consumption of locally caught fish to routine screening.
Module 6	Putting it all together into a risk management approach plus: Fish oil supplements, other dietary sources Environmental and Occupational Health Sciences Division		



# Healthy Fish Choices – [www.healthyfishchoices.org](http://www.healthyfishchoices.org)

HEALTHYFISHCHOICES.ORG

HOME HEALTHCARE PROVIDERS PUBLIC PARTICIPANT SIGN-IN

Promoting healthy fish consumption for women and children

HOME > MY COURSES > HEALTHY FISH CHOICES > MODULE 1 - THE IMPORTANCE OF HEALTHY FISH CHOICES > MODULE 1 - VIDEO PRESENTATION

Module 1 - Video Presentation

00:26 07:45

Note that you can view this video full screen by clicking the rightmost button on the navigation bar above. When the video presentation has completed, please click the tab or button below to proceed to the Case Scenario.

Case Scenario Tab

It is recommended a green buffer will appear. Click the green buffer to respond to the questions and proceed to the next page. All questions are scored with your instructor.

How often should you eat fish with the program?

What is the recommendation?

Good source of protein  
Low in saturated fat

01:34 07:45

Rx

DO NOT EAT  
Swordfish, Tile Fish,  
King Mackerel, or  
Shark, and should stick  
to Chunk Light Tuna.

00:57 07:45

Note that you can view this video full screen by clicking the rightmost button on the navigation bar above. When the video presentation has completed, please click the tab or button below to proceed to the Case Scenario.

Case Scenario Tab

## Healthy Fish Choices Curriculum Summary

Patient Group	Benefits of Fish Consumption	Risks of Overconsumption of Fish	Patient Education
<b>All</b>	<ul style="list-style-type: none"> <li>• High quality, low fat, protein</li> <li>• High in polyunsaturated fatty acids (PUFAs) especially the omega-3 fatty acids EPA and DHA</li> <li>• Primary source of the anti-oxidant selenium</li> </ul>	<ul style="list-style-type: none"> <li>• See risks for different sub-groups below</li> </ul>	<ul style="list-style-type: none"> <li>• General adult population: Eat fish at least twice a week</li> <li>• See group-specific recommendations below</li> </ul>
<b>Pregnant women</b>	<ul style="list-style-type: none"> <li>• Increased birth weight</li> <li>• Increased duration of gestation</li> <li>• Increased IQ in offspring</li> <li>• Enhanced visual acuity in offspring</li> </ul>	<ul style="list-style-type: none"> <li>• Increased preterm delivery</li> <li>• Decreased performance on neurologic testing in offspring</li> </ul>	<ul style="list-style-type: none"> <li>• Eat a variety of fish no more than twice a week</li> <li>• Do not eat: swordfish, tile fish, king mackerel, and shark</li> <li>• Stick to chunk light tuna instead of larger tuna</li> <li>• If no fish consumption, consider supplement</li> </ul>
<b>Breastfeeding women and young children</b>	<ul style="list-style-type: none"> <li>• Improved neurodevelopment</li> <li>• Higher scores on Denver Developmental screening</li> </ul>	<ul style="list-style-type: none"> <li>• Lower scores on neurologic tests</li> </ul>	<ul style="list-style-type: none"> <li>• Eat a variety of fish no more than twice a week</li> <li>• Do not eat: swordfish, tile fish, king mackerel, and shark</li> <li>• Stick to chunk light tuna instead of larger tuna</li> <li>• If no maternal fish consumption, consider supplement with 650mg of DHA+EPA daily</li> </ul>
<b>Adults</b>	<ul style="list-style-type: none"> <li>• Lower coronary heart disease mortality</li> <li>• Lower blood pressure, lower triglycerides</li> <li>• Possible decrease in incidence of stroke, Alzheimer Disease, Type 2 Diabetes</li> </ul>	<ul style="list-style-type: none"> <li>• Higher risk for myocardial infarction</li> <li>• Possible link to elevated blood pressure</li> </ul>	<ul style="list-style-type: none"> <li>• Screen for fish consumption in at-risk populations: Asians, residents in coastal areas, tribal populations, recreational anglers</li> <li>• Patients without heart disease: eat a variety of (preferably fatty) fish at least twice a week</li> <li>• Patients with documented cardiac disease: consume 1 g of EPA+DHA per day preferably from fatty fish</li> <li>• Patients with elevated triglycerides: take 2 to 4 grams of EPA+DHA per day as capsules</li> <li>• Recreational anglers: follow local fish advisories</li> </ul>

# Results

**N=120** completed curriculum

**N=105** (87.5%) completed 3-month follow-up

**Practice types:** Private outpatient, hospital-based outpatient, hospital-based in-patient, public outpatient

**Practice location:** Wisconsin, Michigan, Illinois, Indiana, Ohio, Michigan, Pennsylvania, New York



**Table2: Demographic Characteristics of Study Participants (n = 120)**

	<b>N=</b>	<b>%</b>
<b>Gender</b>		
Female	84	70.0%
Male	36	30.0%
<b>Age</b>		
25 to 34 years	23	19.2%
35 to 44 years	33	27.5%
45 to 54 years	27	22.5%
55 to 64 years	23	19.2%
65 years and up	2	1.7%
Unspecified	12	10.0%
<b>Specialty</b>		
Certified Nurse Midwife / Licensed Midwife	37	30.8%
Family Medicine	37	30.8%
Obstetrics / Gynecology	10	8.3%
Pediatrics	35	29.2%
Pathology	1	0.8%
<b>Years since completing formal training</b>		
5 years or less	27	22.5%
6 to 10 years	22	18.3%
11 to 20 years	31	25.8%
21 years and more	28	23.3%
Unspecified	12	10.0%



As a result of participating in this CME activity do you agree the following objectives were met?	Agree Objectives were met	
	N=	%
Participant is able to describe the benefits of poly-unsaturated fatty acids	108	90.0%
Participant is able to identify the contaminants in fish and their effects on human health	119	99.2%
Participant is able to describe the scientific basis for how contaminants occur in fish	114	95.0%
Participant is able to identify patients who are at-risk of health effects from contaminants of fish due to high consumption	119	99.2%
Participant is able to access national and local fish advisories	111	92.5%
Participant is able to appreciate why everyone - especially pregnant women and children - needs to adopt a healthy fish consumption strategy	118	98.3%
Participant is committed to implementing counseling strategies with patients to promote healthy fish consumption.	117	97.5%

**Table 6: Average Pre-test and Post-test Scores by Training Module  
Healthy Fish Choices Training Modules, 2012-2013**

	Pre-Test			Post-Test			Mean Difference Pre to Post-Test*	P-value
	N= Questions	Mean Score	SD	N= Questions	Mean Score	SD		
le 1	5	53.5%	25.3%	5	84.2%	18.9%	30.7%	<0.001
le 2	7	62.5%	25.6%	6	90.4%	16.0%	27.9%	<0.001
le 3	5	70.5%	26.7%	8	86.8%	13.3%	16.3%	<0.001
le 4	9	63.6%	18.9%	8	83.5%	23.3%	19.9%	<0.001
le 5	7	66.9%	24.3%	9	86.8%	18.4%	19.9%	<0.001
le 6	9	75.6%	20.6%	10	84.4%	11.4%	8.9%	<0.001

\*Adjusted for years of practice, specialty, and 5 or more hours CME training in last hour

\*\*Number of questions varied by module and pre/post-test. Some modules contained questions asked in previous modules which randomly selected.

**Table 4: Barriers to Integrating Discussions on Nutritional Issues within the Medical Practice of Study Participants Healthy Fish Choices Training Modules, 2012-2013**

	<b>N=</b>	<b>%</b>
<b>What are the main barriers you currently encounter when discussing nutrition and food safety issues with patients?</b>		
Lack of time	85	70.8%
More pressing issues	64	53.3%
Low interest by patient population	38	31.7%
Lack of sufficient knowledge to deal with the issues	30	25.0%
Lack of information on referral sources	23	19.2%
Not my area of expertise	22	18.3%
No resources available for patients	14	11.7%
Other specialists in our practice deal with those issues	6	5.0%



# Test scores

- Comparison of the cumulative immediate posttest scores to follow-up scores:
  - **85.9%** (sd=10.2) vs **81.5%** (sd=12.4)
  - decrease ( $p<0.01$ ) in the percent correct answer
- Persistence of improved knowledge -- comparison of cumulative pretest scores to follow-up scores:
  - **66.2%** vs. **81.5%**
  - 15.3% points higher ( $p<0.001$ )



# Clinical practice change

- Immediate: **89.2%** stated that they would implement modifications in their practice
- Follow-up: **79.1%** had adopted new practices to enhance their patient care in regards to fish consumption

# Qualitative responses re: clinical practice change

- *Incorporating discussion about fish consumption in the history and physical exam in the initial visit or follow-up visits*
- *Providing lists of fish to avoid and information about adding fish to diet*
- *Improving screening for at-risk groups based on ethnicity and fish consumption levels*
- *Discussing benefits of eating omega 3's and general counseling on appropriate fish intake and risks*
- *Adding questions to electronic medical record screens*
- *Adding smart phrases and smart text that can be printed out for patients on their after visit summary*

# Revisions

- Reduced required modules
  - Modules 1 and 2 are required for initial CME, 4-6 are for additional CME
- Decreased requirement to post on Discussion Board
- Decreased 2 week interval between Modules
- Size of videos shrunk for faster loading

# Marketing

- State chapters of AAFP, AAP, ACOG, ACNM
- Nurse Practitioner Forum
- State EPAs, DNRs, DOHs
- Environmental groups – Chicago PSR, EHN, Gelfond Fund

*Co-investigators:* Gerald Stapleton, Lee Friedman, Phil Bashook, Gary Loy

# PEHSU Special project: Health Effects of Air Quality on Pregnancy

## On-line module for prenatal providers

[www.freshairformom.org](http://www.freshairformom.org)

**Fresh Air for Mom**  
*Promoting air quality advocacy for women and children.*

Home    Healthcare Providers    Public    Participants

**Helping clinicians address common reproductive health hazards associated with particulates.**

### Overview and Goals

Evidence has increased in the past decade that exposure to toxic air during the prenatal period may exacerbate or cause adverse health outcomes. Pollutants in the air, when inhaled by pregnant women, can cause birth defects, abnormal growth, delayed neurodevelopment, and endocrine disruption in their offspring.

This module is part of a program supported by funds from the Environmental Protection Agency (EPA) to provide training and outreach to doctors, public health nurses, Ob/Gyn residents, and medical students on recognizing reproductive health hazards, taking an environmental history, and providing anticipatory guidance for prevention of exposures to environmental hazards.

The goal of this module is to decrease adverse reproductive outcomes

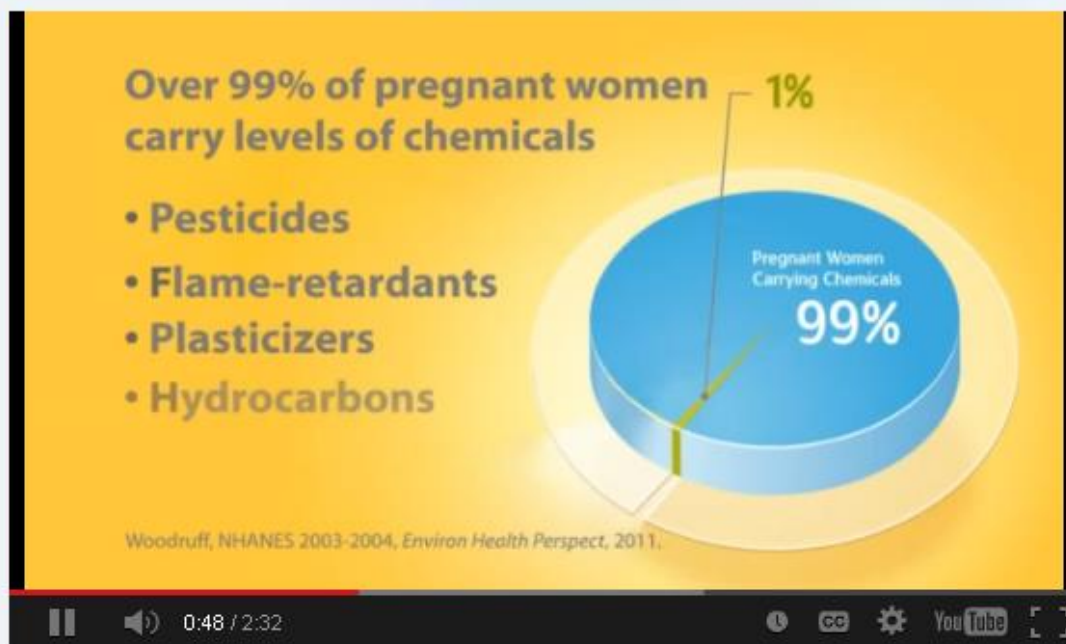
### Objectives

After completion of the online module participants will:

1. Recognize the issues related to three common reproductive health hazards regarding air quality (pesticides, particulates, and environmental tobacco smoke).
2. Demonstrate the ability to take an environmental history of air pollution exposure from their pregnant patients.
3. Accurately assess the risks to their patients and their offspring based on



## Introducing "Fresh Air for Mom" - Video Presentation



Note that you can view this video full screen by clicking the rightmost button on the navigation bar above.

When the video presentation has completed, click the blue button below to proceed to Lesson 1.

**I'm Ready To Begin Lesson 1**

Last modified: Thursday, January 23, 2014, 09:06 AM

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### SETTINGS

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## Lesson 2 Discovery Experience - Outdoor Air Quality

In the second Discovery Experience, you will explore the outdoor home environment and learn about 8 air quality issues that can affect the health of your patients and their unborn offspring. **Click the image below to begin.** The Discovery Experience will open in a Unity pop-up window.



This Discovery Experience will be followed by a short quiz over the air quality hazards you discover in the outdoor environment around the home. Click the button below **after** you have completed the Discovery Experience.

**I'm Finished & Ready for Quiz**

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## Lesson 3 Discovery Experience - Air Quality in the Workplace

In this third and final Discovery Experience, you will explore a work environment and learn about 8 air quality issues that can affect the health of your patients and their unborn offspring. **Click the image below to begin.** The Discovery Experience will open in a Unity pop-up window.



This Discovery Experience will be followed by a short quiz over the air quality hazards you discover in the commercial or work environment. Click the button below *after* you have completed the Discovery Experience.

**I'm Finished & Ready for Quiz**

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Software download complete

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### "Power Mapping" - Video Presentation & Exercise



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When the video presentation has completed, create a powermap for an issue that affects your patients on your own. Click the following link to open the PDF handout for reference as you complete your powermap: [Power Mapping: Step-by-Step](#). Consider the following when creating your powermap: