

## Hugo Aparicio Responses to First Draft of Survey

Do you think that doctors recognize the risks associated with common household and consumer goods or other toxic sources such as:

	Likely	Possibly	Not likely
Pesticides, such as chlorpyrifos		x	
Herbicides			x
Phthalates in air fresheners			x
Radon			x
Asbestos	x		
Arsenic in play structures or water		x	
Exposures at work or toxic dusts on clothing			x
Hobbies or do it yourself activities (glues, solder, sealants)		x	
Sport shooting or eating game with lead fragments		x	
Asthmagens (isocyanates, chlorine, Quats)			x
Inadequate indoor air quality			x
Hair straighteners containing formaldehyde		x	
Nail polishes containing methyl methacrylate		x	
Heavy metals in water, toys, paints		x	
Endocrine disruptors in plastics			x
Flame retardants in furniture			x
Persistent stain resistant chemicals in fabrics			x
PCBs in caulking			x

Do you think doctors know enough about how to recognize the symptoms of exposure?

No, there are too many possible exposures and it is hard to keep up with the medical knowledge unless you specifically work in emergency medicine, occupational medicine or unless you are a very good primary provider

What symptoms do you think justify blood or urine tests that might reveal exposures to lead, mercury, arsenic, and other toxins that could be easily measured?

If you have the appropriate exposure risk, possibly unexplained symptoms such as rash, vision change, altered mental status, movement disorders, difficulty breathing, headache.

Do you think most doctors would order such tests? No

If not, why not? There are usually more common reasons for the above symptoms, and toxins are considered as usually a second line evaluation or even an evaluation reserved for what are thought to be rare causes. I imagine the delay to diagnosis for these kinds of exposures is quite long.

Do you think medical practitioners provide advice to patients about how they might reduce exposures to these toxins?

Most do, concerning \_\_\_\_\_  
 x Few do at all  
 Other

Were you taught about the impact of products or materials in the house that might have an impact on health?

Only the basics, such as intoxication with antifreeze, organophosphates, and certain ingestions. I think I learned more about these than the typical physician because I am a neurologist.

What symptoms would prompt you to investigate the possibility of toxic exposure?

Rash, vision change, altered mental status, movement disorders, difficulty breathing, headache.

Do you feel that you would know enough to recognize the need to investigate?

I feel like I would take a good history and consider a wide differential, so that if I felt a toxic exposure was possible I could pursue that investigation or consult with appropriate specialists to do so. I do not feel confident in recognizing the specific symptoms for the specific toxins.

Do you know enough about how to conduct such an investigation?

Probably not, but there are plenty of online sources such as CDC and UpToDate I can consult.

Do you know specialists to refer to?

I would start with occupational medicine and certain specialists (derm, pulmonary, etc)

Have you ever investigated the possibility of toxic exposures causing symptoms you are seeing?

What did that concern? How often does that happen? (How long have you been practicing)

Rarely. In residency we sometimes expanded the work up for deep brain lesions to heavy metals and exposures such as carbon monoxide, antifreeze, and other CNS toxins. In my current practice (stroke) I almost never work up toxic exposures.

Do you think there is an increase of toxics in the body and that we should be concerned?

Personally, I am concerned about the increasing incidence of allergies, particularly in children, and worry that we are damaging our immune systems in some unknown way with toxics in our environment (via endocrine, immune, or dietary disruption in some way).

Do you think the medical community is paying sufficient attention to the issue of potential toxic exposures?

I think there is some increased focus on this issue

## Jeanne Conry Recommended Revisions to Survey

Do you take a history from patients about environmental exposures in home or in the workplace  
Y or N

Do you think that doctors recognize the risks associated with common household and consumer goods or other toxic sources such as:

Likely Possibly Not likely

Pesticides, such as chlorpyrifos  
Herbicides  
Phthalates in air fresheners  
Radon  
Asbestos  
Arsenic in play structures or water  
Exposures at work or toxic dusts on clothing  
Hobbies or do it yourself activities (glues, solder, sealants)  
Sport shooting or eating game with lead fragments  
Asthmagens (isocyanates, chlorine, Quats)  
Inadequate indoor air quality  
Hair straighteners containing formaldehyde  
Nail polishes containing methyl methacrylate  
Heavy metals in water, toys, paints  
Endocrine disruptors in plastics  
Flame retardants in furniture  
Persistent stain resistant chemicals in fabrics  
PCBs in caulking

**Commented [JAC1]:** You want a much easier format for questions with more yes no and less written responses

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Do you think doctors know enough about how to recognize the symptoms of exposure to potential environmental toxicants?

Or try: Health care providers recognize symptoms of exposure to environmental toxicants in their practice Likely Not likely Not sure

I would draw lab work to test exposure to ... and then do a likely not likely response box

Lead

Mercury

Arsenic

What symptoms do you think justify blood or urine tests that might reveal exposures to lead, mercury, arsenic, and other toxins that could be easily measured?

Do you think most doctors would order such tests?  
If not, why not?

Do you think medical practitioners provide advice to patients about how they might reduce exposures to these toxins?

Most do, concerning \_\_\_\_\_

**Commented [JAC2]:** Spell and write out, docs are not well informed

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**Commented [JAC3]:** You might give specific questions here about mercury or lead since those are the more well know chemical exposures

Few do at all  
Other

Did you receive training in medical school, residency or in maintenance of certification. Were you taught about the impact of products or materials in the house that might have an impact on health?

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What symptoms would prompt you to investigate the possibility of toxic exposure?

Do you feel that you would know enough to recognize the need to investigate?

Do you know enough about how to conduct such an investigation?

Do you know specialists to refer to?

Have you ever investigated the possibility of toxic exposures causing symptoms you are seeing? What did that concern? How often does that happen? (How long have you been practicing)

Do you think there is an increase of toxicants in the body and that we should be concerned?

Do you think the medical community is paying sufficient attention to the issue of potential toxic exposures?

Would you share links and information to patients in your practice that discuss the impact of the environment on health

Commented [JAC4]: You want to change behaviors so find out what behavior works

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What is the best resource or source of learning for you if this topic is new:

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- Online
- Lecture
- Grand rounds
- Conference
- Lunch seminar

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## Deborah Hirtz Responses to First Draft of Survey

Do you think that doctors recognize the risks associated with common household and consumer goods or other toxic sources such as:

**NOT LIKELY for most of these**

Likely Possibly Not likely

Pesticides, such as chlorpyrifos  
Herbicides  
Phthalates in air fresheners  
Radon  
Asbestos  
Arsenic in play structures or water  
Exposures at work or toxic dusts on clothing  
Hobbies or do it yourself activities (glues, solder, sealants)  
Sport shooting or eating game with lead fragments  
Asthmagens (isocyanates, chlorine, Quats)  
Inadequate indoor air quality  
Hair straighteners containing formaldehyde  
Nail polishes containing methyl methacrylate  
Heavy metals in water, toys, paints  
Endocrine disruptors in plastics  
Flame retardants in furniture  
Persistent stain resistant chemicals in fabrics  
PCBs in caulking

Do you think doctors know enough about how to recognize the symptoms of exposure?

**Pediatricians recognize lead toxicity, others exposures not likely**

What symptoms do you think justify blood or urine tests that might reveal exposures to lead, mercury, arsenic, and other toxins that could be easily measured? **Sudden abrupt intellectual deterioration, coma,**

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Do you think most doctors would order such tests? **Some depends on clinical picture**  
If not, why not?

Do you think medical practitioners provide advice to patients about how they might reduce exposures to these toxins?

Most do, concerning \_\_\_\_\_  
Few do at all **X**  
Other

Were you taught about the impact of products or materials in the house that might have an impact on health? **No**

What symptoms would prompt you to investigate the possibility of toxic exposure?

**Too complicated to answer that, depends on age, circumstances, occupational exposures, ruling out other causes etc**

Do you feel that you would know enough to recognize the need to investigate? **yes**

Do you know enough about how to conduct such an investigation? **no**

Do you know specialists to refer to? **Am not sure there are specialists, don't know them.**

Have you ever investigated the possibility of toxic exposures causing symptoms you are seeing?  
**Lead toxicity, acute childhood poisoning** What did that concern? How often does that happen? (How long have you been practicing)**not in practice full time, I do clinical research.**

Do you think there is an increase of toxics in the body and that we should be concerned? **YES**

Do you think the medical community is paying sufficient attention to the issue of potential toxic exposures? **NO**

## Mark Miller Responses to First Draft of Survey

Do you think that doctors recognize the risks associated with common household and consumer goods or other toxic sources such as:

Likely   Possibly   Not likely

Pesticides, such as chlorpyrifos

Herbicides

Phthalates in air fresheners (why just in air fresheners?)

Radon

Asbestos

Arsenic in play structures or water (why just these sources)

Exposures at work or toxic dusts on clothing (are you trying to get at take home exposures or just work related exposures? Not clear)

Hobbies or do it yourself activities (glues, solder, sealants)

Sport shooting or eating game with lead fragments

Asthmagens (isocyanates, chlorine, Quats)

Inadequate indoor air quality

Hair straighteners containing formaldehyde

Nail polishes containing methyl methacrylate

Heavy metals in water, toys, paints

Endocrine disruptors in plastics

Flame retardants in furniture

Persistent stain resistant chemicals in fabrics

PCBs in caulking

When you ask about recognizing the potential health effects of a chemical exposure it is generally the same regardless of the source. So at most if you want to use source examples you should say (such as from...)

Do you think doctors know enough about how to recognize the symptoms of exposure? I don't know if there is value in getting your participants view of what "doctors" know. I think you are better asking questions about what they know or do.

What symptoms do you think justify blood or urine tests that might reveal exposures to lead, mercury, arsenic, and other toxins that could be easily measured? I don't know how you are going to evaluate this. I think that this is too open. You need to be more specific. As someone who works in children's environmental health, there are relatively few instances when we would recommend biomonitoring testing for exposure. There certainly are symptoms that would indicate the need but most clinicians would not know this for sure and at any rate this question will be hard to get usable information from. I think that a broader question like, "are you confident that you are able to recognize symptoms resulting from toxic exposures to xxx that would indicate the need for testing"?

Do you think most doctors would order such tests? Why do you care about their assessment of what most doctors would do? The question should be do you ever order such tests, are you confident that you know when to order, are you confident in interpreting the results, do you have consultants that you go to that are knowledgeable about,...?

If not, why not?

Do you think medical practitioners provide advice to patients about how they might reduce exposures to these toxins? Same response. Are you trying to find out what practitioners think about the general issue of how the clinical world addresses this? I don't think so. Are you familiar with the various surveys that have already been done to assess clinicians knowledge and practice about environmental health hazards?

Most do, concerning \_\_\_\_\_  
Few do at all  
Other

Were you taught about the impact of products or materials in the house that might have an impact on health? You might want to be more specific, taught in your formal medical education? At CME conferences or other locations?

What symptoms would prompt you to investigate the possibility of toxic exposure?

Do you feel that you would know enough to recognize the need to investigate?

Do you know enough about how to conduct such an investigation?

Do you know specialists to refer to?

Have you ever investigated the possibility of toxic exposures causing symptoms you are seeing? What did that concern? How often does that happen? (How long have you been practicing)

Do you think there is an increase of toxics in the body and that we should be concerned? Kind of a difficult question to gauge the meaning of the answers I would think. Are you concerned about the potential hazards of routine chemical exposures that your patients encounter?

Do you think the medical community is paying sufficient attention to the issue of potential toxic exposures? OK, but might be more important to assess "would you like to have more education in evaluating potential toxic exposures? Or in giving guidance to your patients on reducing exposures to potentially toxic chemicals."

## Olufunke Pickering Responses to First Draft of Survey

Do you think that doctors recognize the risks associated with common household and consumer goods or other toxic sources such as:

	Likely	Possibly	Not likely
Pesticides, such as chlorpyrifos	Likely		
Herbicides	Likely		
Phthalates in air fresheners	Not likely		
Radon	Possibly		
Asbestos	Likely		
Arsenic in play structures or water	Likely		
Exposures at work or toxic dusts on clothing	Possibly		
Hobbies or do it yourself activities (glues, solder, sealants)		Likely	
Sport shooting or eating game with lead fragments	Possibly		
Asthmagens (isocyanates, chlorine, Quats)	Possibly		
Inadequate indoor air quality	Likely		
Hair straighteners containing formaldehyde	Not Likely		
Nail polishes containing methyl methacrylate	Not Likely		
Heavy metals in water, toys, paints	Possibly		
Endocrine disruptors in plastics	Possibly		
Flame retardants in furniture	Possibly		
Persistent stain resistant chemicals in fabrics	Possibly		
PCBs in caulking	Not likely		

Do you think doctors know enough about how to recognize the symptoms of exposure?  
No. However, all physicians have access to poison control for consultation. Typically any person experiencing with symptoms resulting from exposure to any of these agents will present to their primary care physician or emergency room. As a result some physicians depending on their specialties may have experience with dealing with the effects of some of these agents than others.

What symptoms do you think justify blood or urine tests that might reveal exposures to lead, mercury, arsenic, and other toxins that could be easily measured? **The American Academy of Pediatrics recommends that children be tested for lead at 1yr and 2yrs, so children are routinely tested for lead. However, there is no simple answer to this question as symptoms resulting from exposure can vary depending on the age of the individual exposed, the quantity and the mode of exposure (inhaled/through the skin/ingested). In addition, one has to consider if this is a single event exposure or continuous over a prolonged period of time. Finally, most of the symptoms can mimic other more common diseases, for example arsenic can cause vomiting and skin lesions. Blood tests for poisons are performed once all other more common diseases that may be causing the presenting symptoms have been ruled out.**

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Do you think most doctors would order such tests?

**If not, why not? No, for many other reasons (beyond the scope here), physicians already order more tests than is clinically necessary. This is contributes for the ever increasing healthcare costs, without an equivalent improvement in health outcomes.**

Do you think medical practitioners provide advice to patients about how they might reduce exposures to these toxins?

OB/Gyns typically advise pregnant women about agents that may pose harm to their fetus. Pediatricians also counsel about lead exposure and other environmental agents that may affect the developing brain of a child. In addition, patients are also asked about the type of work they do in order to screen for potential harmful agents.

Most do, concerning \_\_\_\_\_  
Few do at all  
Other

Were you taught about the impact of products or materials in the house that might have an impact on health?

What symptoms would prompt you to investigate the possibility of toxic exposure?

Do you feel that you would know enough to recognize the need to investigate?

Do you know enough about how to conduct such an investigation?

Do you know specialists to refer to?

Have you ever investigated the possibility of toxic exposures causing symptoms you are seeing? What did that concern? How often does that happen? (How long have you been practicing)

Do you think there is an increase of toxics in the body and that we should be concerned?

Do you think the medical community is paying sufficient attention to the issue of potential toxic exposures?

Herbicides, pesticides, arsenic and such items you mentioned are not items that people should routinely encounter or be exposed to. If they are, it may be accidental ingestion or involve a felonious act of another. In either case, an investigation is warranted. For example any elevated lead test result is automatically sent to the health department which goes to the home to investigate the source. Public awareness measure have been taken to make people aware of the dangers of asbestos, and there is routine testing done (should be done) when purchasing or doing renovations on a home. This is especially the case with older homes. Radon is also part of a home inspection in the purchase of a home and home owners are informed on how to monitor and test for it.

Keep in mind that symptoms resulting from exposure to these items vary and can mimic common diseases. In addition, the effects of exposure to other items like radon, asbestos and lead may not be evident for year after exposure.

## Russ Hauser Recommended Revisions to Survey

Do you think that doctors recognize the risks associated with common household and consumer goods or other toxic sources such as:

Likely   Possibly   Not likely

- Pesticides, such as chlorpyrifos
- Herbicides
- Phthalates in air fresheners
- Radon
- Asbestos
- Arsenic in play structures or water
- Exposures at work or toxic dusts on clothing
- Hobbies or do it yourself activities (glues, solder, sealants)
- Sport shooting or eating game with lead fragments
- Asthmagens (isocyanates, chlorine, Quats)
- Inadequate indoor air quality
- Hair straighteners containing formaldehyde
- Nail polishes containing methyl methacrylate
- Heavy metals in water, toys, paints
- Endocrine disruptors in plastics
- Flame retardants in furniture
- Persistent stain resistant chemicals in fabrics
- PCBs in caulking

**Commented [RHaus1]:** Quite a lot of substances you are asking about. May want to shorten or make more specific.

**Commented [RHaus2]:** Also in many other products, cosmetics, vinyl plastics, etc

**Commented [RHaus3]:** Not in consumer goods but comes from the ground, naturally occurring gas

Do you think doctors know enough about how to recognize the effects/symptoms of exposure?

What signs and symptoms do you think justify blood or urine tests that might reveal exposures to lead, mercury, arsenic, and other toxins that could be easily measured?

Do you think most doctors would order such tests?  
If not, why not?

Do you think medical practitioners provide advice to patients about how they might reduce exposures to these toxins?

Most do, concerning \_\_\_\_\_

- Some do
- Few do ~~at all~~
- None do

Other

Were you taught about the impact of products or materials in the house that might have an impact on health?

What signs and symptoms would prompt you to investigate the possibility of toxic exposure?

**Commented [RHaus4]:** What did you have in mind specifically? Always good to think of range of answers you may get on an open ended question

**Commented [RHaus5]:** In medical school or elsewhere? May want to be specific.

Do you feel that you would know enough to recognize the need to investigate?

Do you know enough about how to conduct such an investigation?

Do you know specialists to refer to?

Have you ever investigated the possibility of toxic exposures causing symptoms you are seeing?  
What did that concern? How often does that happen? (How long have you been practicing)

Do you think there is an increase of toxics in the body and that we should be concerned?

Do you think the medical community is paying sufficient attention to the issue of potential toxic exposures?

## Ted Schettler Recommended Revisions to Survey

Do you think that doctors recognize or consider the risks associated with common household and consumer goods or other toxic sources such as:

Likely Possibly Not likely

- Pesticides, such as chlorpyrifos
- Herbicides
- Phthalates in air fresheners
- Radon
- Asbestos
- Arsenic in play structures or water
- Exposures at work or toxic dusts on clothing brought into the home
- Hobbies or do it yourself activities (glues, solder, sealants)
- Sport shooting or eating game with lead fragments
- Asthmagens (isocyanates, chlorine, Quats)
- Inadequate indoor air quality

### Exposure to tobacco smoke

- Hair straighteners containing formaldehyde
- Nail polishes containing methyl methacrylate
- Heavy metals in water, toys, paints
- Endocrine disruptors in plastics
- Flame retardants in furniture
- Persistent stain resistant chemicals in fabrics
- PCBs in caulking

Do you think doctors know enough about how to recognize the symptoms of exposure?

What findings in an environmental history or symptoms do you think justify blood or urine tests that might reveal exposures to lead, mercury, arsenic, and other toxins that could be easily measured? \_\_\_\_\_

Do you think most doctors would order such tests?  
If not, why not?

Do you think medical practitioners provide advice to patients about how they might reduce exposures to these toxins?

- Most do, concerning \_\_\_\_\_
- Few do at all
- Other

Were you taught about the impact of products or materials in the house that might have an impact on health?

What symptoms would prompt you to investigate the possibility of toxic exposure?

Do you feel that you would know enough to recognize the need to investigate?

**Commented [ts1]:** You might also try to find out if they ask patients or families about them

**Commented [ts2]:** The paper by Trasande et al might give you some ideas about additions or ways to classify. For example, a question about drinking water quality at all. Or a question about cosmetics and other personal care products at all.

**Commented [ts3]:** Not sure why you singled out cpf

**Commented [ts4]:** You'll see in the attached papers what a couple of surveys have shown. I've attached one from NY but this survey was done in MI as well, and results were similar.

**Commented [ts5]:** I'm suggesting this because opportunities for prevention of harm present before symptoms occur. Once there are symptoms related to an enviro exposure, some damage may well have already happened. Doctors should have a low threshold for further investigation, based on responses to an environmental history

**Commented [ts6]:** See comment above

Do you know enough about how to conduct such an investigation?

Do you know specialists to refer to?

Have you ever investigated the possibility of toxic exposures causing symptoms you are seeing?  
What did that concern? How often does that happen? (How long have you been practicing)

Do you think there is an increase of toxics in the body and that we should be concerned?

Do you think the medical community is paying sufficient attention to the issue of potential toxic exposures?

**Commented [ts7]:** I'd suggest wording this as exposures that we should be concerned about rather than "an increase in the body". For example, many toxic cmpds have short half lives and their levels are not necessarily increasing.