

## Land Acknowledgement

Traditional territory of the Kanien'kehà:ka, a place which has long served as a site of meeting and exchange amongst many First Nations including the Kanien'kehà:ka of the Haudenosaunee Confederacy, Huron/Wendat, Abenaki, and Anishinaabeg.

The Kanien'kehà:ka are the traditional custodians of the lands and waters on which we meet during the conference. Our gratitude.

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## Approach to Mould and Housing-Related Health Problems

Family Medicine Forum

Montreal, November 9, 2023

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## Disclosure of Financial Sponsors/Support

**Presenter: Erica Phipps**

- RentSafe/CPCHE:
  - Catherine Donnelly Foundation
  - Raffi Foundation for Child Honouring
- Postdoctoral Fellowship, University of Ottawa
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  - Health Canada contract - Maternal-Infant Research on Environmental Chemicals (MIREC)
- Member, Canadian Committee on Indoor Air Quality
- No patents or other financial relationships

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The RentSafe initiative also benefits from in-kind support from RentSafe and CPCHE partners

Potential for conflict(s) of interest: None

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## Presenter Disclosure - Financial Sponsors

**Presenter : Donald C Cole**

- Public e-consult and clinical consult provider in Ontario
- Senior Advisor to Global Action For Fungal Infections (GAFFI)  
<https://gaffi.org/who/senior-advisors/#biog4>
- Contracted MD with Occupational Health Clinic for Ontario Workers
- Receipt of honoraria from Workplace Safety and Insurance Board (WSIB) of Ontario as member of the Scientific Advisory Table on Occupational Disease
- Co-investigator on publicly funded grants, including on fungal infections.
- No patents or other financial relationships

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## Case 1



### Child in rental housing with allergic sx

- multiple moulds in various locations throughout the house:
  - Mushroom-like growth under kitchen sink
  - child's bedroom closet adjacent to unvented bathroom - black mould, front hall closet - children's backpacks mouldy
- youngest child developed runny nose and generally ill
- sx resolved once family moved

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## Case 2

### Senior living in co-op apartment in seniors' complex

- chronic condensation around A/C ducts; mould eventually became visible on ceiling
- initial inquiry led to superficial clean-up
- follow-up revealed extensive mould in A/C system and surrounding areas
- multiple units affected
- Sx included chronic cough and congestion, fatigue & brain fog



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## Your experience

- Do these cases resonate with ones you have seen in your practice?
- Who among you have:
  - Had patients come in with symptoms linkable to mould?
    - Did you or the patient make the link to mould?
  - Been frustrated on how to resolve the patient's health concern?
  - Been successful in spurring mould clean up and resolution of symptoms?
  - Made referrals to other service providers in the community?

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## Learning Objectives

*We hope that by the end of this session, you will be able to:*

1. Recognize potential housing-related mould exposure and associated symptom clusters affecting patients
2. Assess patients with suspected or self-reported mould exposure using a focused exposure history.
3. Identify community resources for patients with mould-related health problems in rental housing.

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## Descriptive Epidemiology of Mould Exposure (i)

### Variability:

- About 10% of population and 25-40% of atopic persons are allergic to mould
  - **precautionary approach:** Health Canada considers indoor mould growth to be a significant health hazard
  - mould is not consistent with healthy housing, not everyone in household will present with clinical sx



Health Canada (2014). Addressing moisture and mould in your home.

<https://www.canada.ca/en/health-canada/services/publications/healthy-living/addressing-moisture-mould-your-home.html>

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## Descriptive Epidemiology of Mould Exposure (ii)

### Vulnerable include:

- children, cystic fibrosis, asthmatics, respiratory conditions
- immune suppressed including haematological malignancies, cancer patients chemoTx & radiation , HIV positive, transplant patients



Summerbell & Hart (2021). Health Impacts of Indoor Dampness and Mould and Effective Remediation and Prevention Strategies: Expert Review and Summary of Evidence.

[https://rentsafecanada.files.wordpress.com/2022/02/mould-expert-report\\_health-impactsremediation.pdf](https://rentsafecanada.files.wordpress.com/2022/02/mould-expert-report_health-impactsremediation.pdf)

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## Strength of Evidence - Indoor Dampness and Mould (D/M) (i)

Category for Strength of Evidence	Health Impacts of Indoor D/M	
<b>Sufficient evidence of a causal relationship</b> with indoor D/M	Exacerbation of existing asthma in children	
<b>Sufficient evidence of an association</b> with indoor D/M	Asthma: <ul style="list-style-type: none"> <li>• development</li> <li>• ever-diagnosed</li> <li>• current</li> <li>• exacerbation</li> </ul> Bronchitis Eczema	Respiratory infections <ul style="list-style-type: none"> <li>• Dyspnea (chest tightening, difficulty breathing), Wheeze, Cough</li> <li>• Allergic rhinitis</li> <li>• Upper respiratory tract symptoms</li> </ul>

Hung LL, et al. (2020). *Recognition, Evaluation, and Control of Indoor Mold*. American Industrial Hygiene Association

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## Strength of Evidence - Indoor Dampness and Mould (D/M) (ii)

Category for Strength of Evidence	Health Impacts of Indoor D/M	
<b>Limited or suggestive evidence of an association</b> with indoor D/M	<ul style="list-style-type: none"> <li>• Common cold like symptoms</li> <li>• Allergy/atopy</li> <li>• Depression, mediated by perception of control*</li> </ul>	
<b>Inadequate or insufficient evidence to determine whether an association exists</b> with indoor D/M	Altered lung function	Any other health effect not listed above
Limited or suggestive evidence of <b>no</b> association with D/M	No health effect identified	

Hung LL, et al. (2020). *Recognition, Evaluation, and Control of Indoor Mold*. American Industrial Hygiene Association.

\*Shenassa et al. *Am J Public Health*. 2007;97:1893–1899. doi:10.2105/AJPH.2006.093773

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## Climate change increasing mould exposure

1. Extreme rainfall events cause *overland flooding* from rivers, reservoirs, lakes
2. Gales and hurricanes cause surges and *coastal flooding*
3. Severe weather *degrades housing 'envelope'*, increasing indoor water damage/mould



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## Flooding from rivers and lakes

Main cause of flooding in Canada

- Upper: Gatineau, 2019, 2023
- Lower: Abbotsford/Sumas 2021

Communities affected by flooding have higher mould exposure, and higher prevalence of mental health concerns



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## Health studies post Hurricane Harvey flooding

Time series analysis of medically insured - first year after hurricane:

- 1.7X increase in mold exposure-related diagnoses compared with year before hurricane
- No increase in invasive fungal infections

Benedict, K., et al. (2023). *Disaster Med Public Health Prep.* 17(e504), 1–3.  
<https://doi.org/10.1017/dmp.2023.28>

Survey of 103 immunosuppressed residents affected by flooding:

- 49% engaged in cleanup of mold and water-damaged areas
- Only 43% of those doing heavy cleanup wore a respirator

Chow, N.A., et al. (2019). *Morbidity and Mortality Weekly Report.* 68(21), 469-473.  
<http://dx.doi.org/10.15585/mmwr.mm6821a1>

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## Higher Prevalence Health Effects -Japan Flooded Home respondents

### Within 1 week:

Stress	42%
Anxiety	30%
Nasal sx	15%
Headaches/ dizziness	12%
Respiratory sx	11%

### 6 months post-flooding:

Stress	23%
Anxiety	16%
PTSD	8%

Nasal sx: OR 7 if “very much”  
visible mold in home

Azuma, K., et al. (2014). *International Journal of Environmental Health Research*. 24(2): 158-175.  
<https://doi.org/10.1080/09603123.2013.800964>

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## Medical conditions among flood recovery personnel (paid & volunteer)- review (i)

Organ system/pathway	Clinical presentation	Exposure/agents
Upper airways: nose, sinuses, throat	Rhinitis, sinusitis, laryngitis	Fungi, allergens, MVOCs, irritants, particles
Lower airways: lung with bronchial system and alveoli	Bronchitis, asthma, bronchiolitis, allergic bronchopulmonary aspergillosis (ABPA), toxic alveolitis, pneumonitis	Fungi, allergens, fungal byproducts, fine particles
Combined upper and lower airway	Aspergillosis; fungal rhino-sinusitis & allergic extrinsic alveolitis (aka hypersensitivity pneumonitis)	Fungi, fine particles, fungal irritants, allergens

Johanning, E., Auger, P., et al. (2014). *Environ Health Prev Med*. 19:93–99  
<https://doi.org/10.1007/s12199-013-0368-0>

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## Medical conditions among flood recovery personnel - review (ii)

Organ system/pathway	Clinical presentation	Exposure/agents
Skin and mucous membranes	Urticaria, sunburn-like rash, dermatitis (allergic or irritant type), conjunctivitis (burning & tearing)	Fungal irritants, allergens
Other organs: liver, kidney, & systems: central nervous, immune & endocrine	hepatitis, nephritis, headaches-cognitive & psychiatric disorders, severe fatigue thyroid, menstrual disorders	Fungi, organic dusts, microbial by-products, mycotoxins

Johanning, E., Auger, P., et al. (2014). *Environ Health Prev Med.* 19:93–99  
<https://doi.org/10.1007/s12199-013-0368-0>

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## Clinical Approach

- I. Assessment
  - A. Documentation of source/exposure
  - B. Documentation of symptoms
  - C. Clinical testing (as appropriate)
- II. Management
  - A. Source/exposure reduction
  - B. Condition treatment
  - C. Social support

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## Documentation of Exposure (i)

- General environmental exposure history (Community, **Home**, Hobby, Occupation, Personal, Diet & Drugs)\*
- Photos of sources by patient - caregiver. Bring into the office



\* <https://aseq-ehaq.ca/wp-content/uploads/2020/07/Taking-an-Exposure-History-CH2OPD2.pdf>

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## Documentation of Exposure (ii)

- Assess **size** of mould affected area

Classification of Extent of Visible Mould

Small	Moderate	Extensive
3 or fewer patches and the total area is less than 1m <sup>2</sup>	If there are more than 3 patches or if the patches are greater than 1m <sup>2</sup> but less than 3m <sup>2</sup>	If a single patch is larger than 3m <sup>2</sup>

Source: Canada Mortgage and Housing/Health Canada

- Air testing for mould generally **not helpful** for either quantity or type of mould



Photo source: <https://www.canada.ca/en/health-canada/services/publications/healthy-living/addressing-moisture-mould-your-home.html>

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## Patient - Caregiver Documentation of Symptoms

- **Diary of symptoms** (own or child - dependent's) in response to exposures
  - when worse e.g. when stuck indoors,
  - what may relieve symptoms e.g. walking outside, using medication
- **Fluctuating health status monitoring** e.g.
  - serial peak flows by asthmatics with readings in mouldy area and away from mouldy environment
  - photos on cell phone of rash exacerbations
  - pain intensity (VAS scale) for headaches

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## Clinical Testing

- **Condition appropriate** e.g.
  - WBC, CXR, pulmonary function testing for respiratory conditions
  - cognitive testing & depression scale for mycotoxic neurological effects
  - skin-prick allergen testing for recurrent rashes - limited suite panel (Alternaria, Cladosporium, Penicillium, Aspergillus, Candida)

Larenas-Linnemann et al. (2016). *J Allergy Clin Immunol Pract.* 4(3): P405-414  
<http://dx.doi.org/10.1016/j.jaip.2015.10.015>

- **Specific fungal disease** e.g. *allergic bronchopulmonary aspergillosis (ABPA)*

- consider provincial public laboratory available fungal serology testing

Cole, D., et al. (2017). *Lancet ID.* 17(12): e412-e419  
[https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(17\)30308-0/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(17)30308-0/fulltext)

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## Exposure Reduction

- Practical mould remediation guidance in: *Part 2 Rentsafe Mould Expert Report*  
[https://rentsafecanada.files.wordpress.com/2022/02/mould-expert-report\\_health-impactsremediation.pdf](https://rentsafecanada.files.wordpress.com/2022/02/mould-expert-report_health-impactsremediation.pdf)
- Building owner reducing humidity sources e.g. fix leaky plumbing, install extractor fans in bathroom, dehumidifiers in basement
- Cleanup of mould - bleach not recommended; usually requires PPE protection; materials removal e.g. mould impregnated wall board
- Professional cleanup if extensive



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## Symptom Reduction & Social Support

- *Treatment of condition* e.g. asthma therapy
- *Social support*
  - Supports for negotiations with building owner, financial challenges, move to other accommodation - importance of mould team.
  - Physician role to included referrals, letters (with patient consent)

<https://rentsafe.ca/2019/06/26/new-resources-on-mould-and-health-for-physicians-and-their-patients/>

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**Any urgent  
s-mould-ering  
questions?**



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## **The Housing Crisis as context for Mould Exposure**



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## Housing Crisis & Mould Exposure

Dampness and mould occur most typically in:

- older housing stock
- housing with substandard renovations
- housing with inadequate maintenance
- unsuccessful attempts to adapt housing to unusually cold climates or unconventional foundations (e.g., homes built directly on irregular rock)
- inadequate housing in Indigenous communities

Summerbell & Hart (2021). Health Impacts of Indoor Dampness and Mould and Effective Remediation and Prevention Strategies: Expert Review and Summary of Evidence.

[https://rentsafecanada.files.wordpress.com/2022/02/mould-expert-report\\_health-impactsremediation.pdf](https://rentsafecanada.files.wordpress.com/2022/02/mould-expert-report_health-impactsremediation.pdf)

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## Housing need in Canada

Definition of core housing need:

- Adequacy: major repairs are required
- Suitability: there are not enough bedrooms
- Affordability: housing costs are more than 30% of household income

Approximately 1 in 10 Canadian households in core housing need, 2021

- Renters 4x as likely to be in core housing need (renters = 20%; owners = 5.3%)
- Nearly 20% of Indigenous population living in a dwelling in need of major repairs (2016 data)

<https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2022056-eng.htm>

<https://www.cmhc-schl.gc.ca/blog/2019-housing-observer/indigenous-households-core-housing-need>

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## Tenants experience multiple challenges

- Rental housing stock is aging (78% built before 2000)
- Onus is on tenants to raise concerns:
  - possible risks for tenants (eviction, stigma, discrimination)
  - tenants may not know their rights
  - face multiple hurdles in accessing justice and supports
- Housing maintenance is subject to landlord engagement and compliance
- Limited housing affordability and availability
  - many have to settle for what is available and affordable
- Energy poverty:
  - continuous heating throughout housing unit can be challenge when faced with difficult choices in allocating scarce resources for daily living

<https://www03.cmhc-schl.gc.ca/hmip-pimh/en#Profile/1/1/Canada>

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### RentSafe

- Ontario-based initiative led by CPCHE to address unhealthy conditions in low-income rental housing
- Aims to improve the intersectoral “system” for response and prevention
- Tenants’ grounded (lived) expertise informs the conceptualization of problems and solutions
- Multiple sectors actively involved
- Advancing the right to healthy homes for all

[RentSafe.ca](https://rentsafe.ca)  
[LogementSain.ca](https://logementsain.ca)

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## RentSafe baseline research



**Focus groups with tenants** living on low income and urban and rural settings (n=80)

**Sectoral surveys** with public health, legal aid, small-scale landlords, frontline professionals, municipal property standards/by-law)

Findings suggest insufficient:

- resources for response and coordination across sectors
- capacity for follow-up
- regulatory framework in support of the right to healthy housing



RentSafe (2018). Towards Healthy Homes for All: RentSafe Summary and Recommendations. [https://rentsafecanada.files.wordpress.com/2018/10/rentsafe-summary-report\\_final.pdf](https://rentsafecanada.files.wordpress.com/2018/10/rentsafe-summary-report_final.pdf)

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## Who is the 'mould action team' in your community?



Addressing housing habitability concerns often requires intersectoral collaboration and coordination:

- Physician:
  - diagnosing and reporting health effect
  - providing letter to support patient self-advocacy
- Public Health
- Legal aid (or equivalent)
- Municipal by-law/property standards
- Frontline social services
- Housing providers
- Tenants/residents

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## Building intersectoral capacity

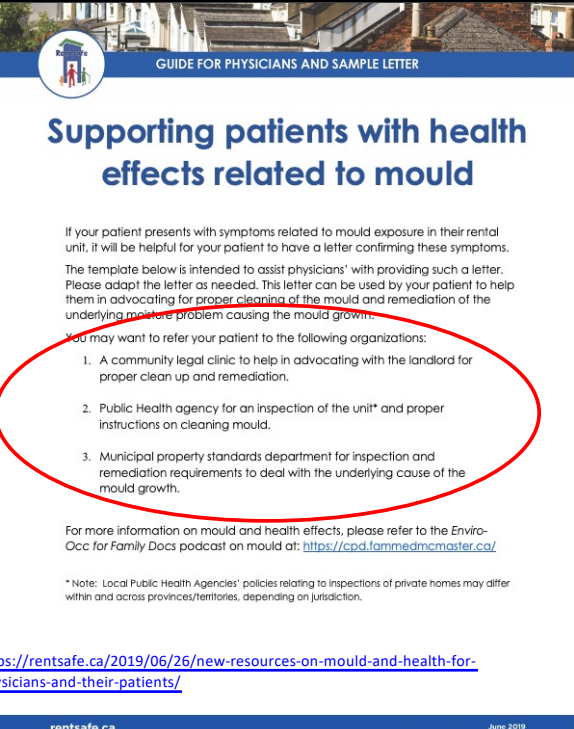
Suite of resources to support action on mould in housing:

- **Training podcast** for physicians  
<https://rentsafe.ca/2018/03/08/blog-podcasts/>
- **Guide for patients/tenants** living with mould →
- **Guidance and sample letter for physicians** to support patient/tenant self-advocacy
- **Expert report** on mould health effects, prevention & remediation
- **Model by-law language**

<https://rentsafe.ca/2019/06/26/new-resources-on-mould-and-health-for-physicians-and-their-patients/>



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**GUIDE FOR PHYSICIANS AND SAMPLE LETTER**

## Supporting patients with health effects related to mould

If your patient presents with symptoms related to mould exposure in their rental unit, it will be helpful for your patient to have a letter confirming these symptoms. The template below is intended to assist physicians' with providing such a letter. Please adapt the letter as needed. This letter can be used by your patient to help them in advocating for proper cleaning of the mould and remediation of the underlying moisture problem causing the mould growth.

You may want to refer your patient to the following organizations:

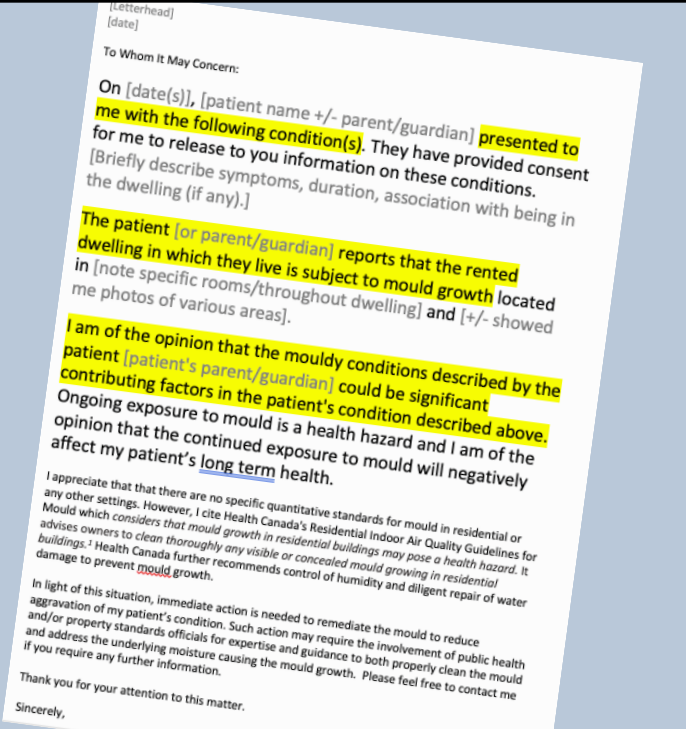
1. A community legal clinic to help in advocating with the landlord for proper clean up and remediation.
2. Public Health agency for an inspection of the unit\* and proper instructions on cleaning mould.
3. Municipal property standards department for inspection and remediation requirements to deal with the underlying cause of the mould growth.

For more information on mould and health effects, please refer to the Enviro-Occ for Family Docs podcast on mould at: <https://cpd.torontomcmaster.ca/>

\* Note: Local Public Health Agencies' policies relating to inspections of private homes may differ within and across provinces/territories, depending on jurisdiction.

<https://rentsafe.ca/2019/06/26/new-resources-on-mould-and-health-for-physicians-and-their-patients/>

rentsafe.ca June 2019



[letterhead]  
[date]

To Whom It May Concern:

On [date(s)], [patient name +/- parent/guardian] presented to me with the following condition(s). They have provided consent for me to release to you information on these conditions. [Briefly describe symptoms, duration, association with being in the dwelling (if any).]

The patient [or parent/guardian] reports that the rented dwelling in which they live is subject to mould growth located in [note specific rooms/throughout dwelling] and [+/- showed me photos of various areas].

I am of the opinion that the mouldy conditions described by the patient [patient's parent/guardian] could be significant contributing factors in the patient's condition described above. Ongoing exposure to mould is a health hazard and I am of the opinion that the continued exposure to mould will negatively affect my patient's long term health.

I appreciate that there are no specific quantitative standards for mould in residential or any other settings. However, I cite Health Canada's Residential Indoor Air Quality Guidelines for Mould which considers that mould growth in residential buildings may pose a health hazard. It advises owners to clean thoroughly any visible or concealed mould growing in residential buildings.<sup>1</sup> Health Canada further recommends control of humidity and diligent repair of water damage to prevent mould growth.

In light of this situation, immediate action is needed to remediate the mould to reduce aggravation of my patient's condition. Such action may require the involvement of public health and/or property standards officials for expertise and guidance to both properly clean the mould and address the underlying moisture causing the mould growth. Please feel free to contact me if you require any further information.

Thank you for your attention to this matter.

Sincerely,

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## Case Revisit

- Mom with children in rental unit
- Senior in co-op building:
  - Primary care MD recognized mould exposure as contributor to physical, cognitive impacts
  - Repeated advocacy by residents led to fulsome investigation and response
  - Adult children provided portable, responsive HEPA filter air cleaner (not ionizing)
  - Remediation underway: significant replacement needed of ceiling, walls; multiple units



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## Discussion

*Thinking of cases in your practice:*

- Do you think the RentSafe materials might help you in resolving patient's concerns about mould exposure?
- Are there things you have done in your practice which were particularly helpful?
- Any further resources that might help you?

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***Thank you!***  
***Merci !***

**RentSafe.ca**  
**LogementSain.ca**

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[geri@healthenvironmentforkids.ca](mailto:geri@healthenvironmentforkids.ca)

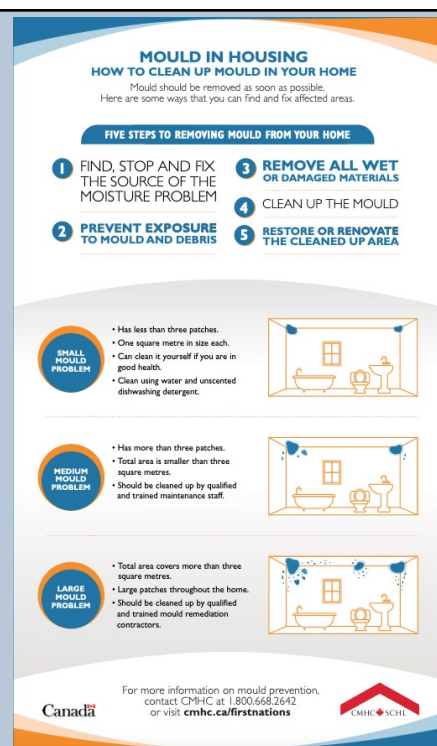
### Key take-aways:

1. Consider mould exposure when patients present with non-specific symptoms
  - Ask about home and housing
2. Air testing for mould is not recommended in most cases
3. Physicians, as trusted/respected providers, can play a key role in advocating for healthy housing and connecting patients with community supports (e.g., legal aid, public health)

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## Resources:

- RentSafe mould resources collection:  
<https://rentsafe.ca/2019/06/26/new-resources-on-mould-and-health-for-physicians-and-their-patients/>
- Health Canada: <https://www.canada.ca/en/health-canada/services/publications/healthy-living/addressing-moisture-mould-your-home.html>
- CMHC: <https://www.cmhc-schl.gc.ca/professionals/industry-innovation-and-leadership/industry-expertise/indigenous-housing/develop-manage-indigenous-housing/maintenance-solutions/mould-in-housing>
- Public Health: See your local health unit/authority's website



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## Please fill out your session evaluation now!

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