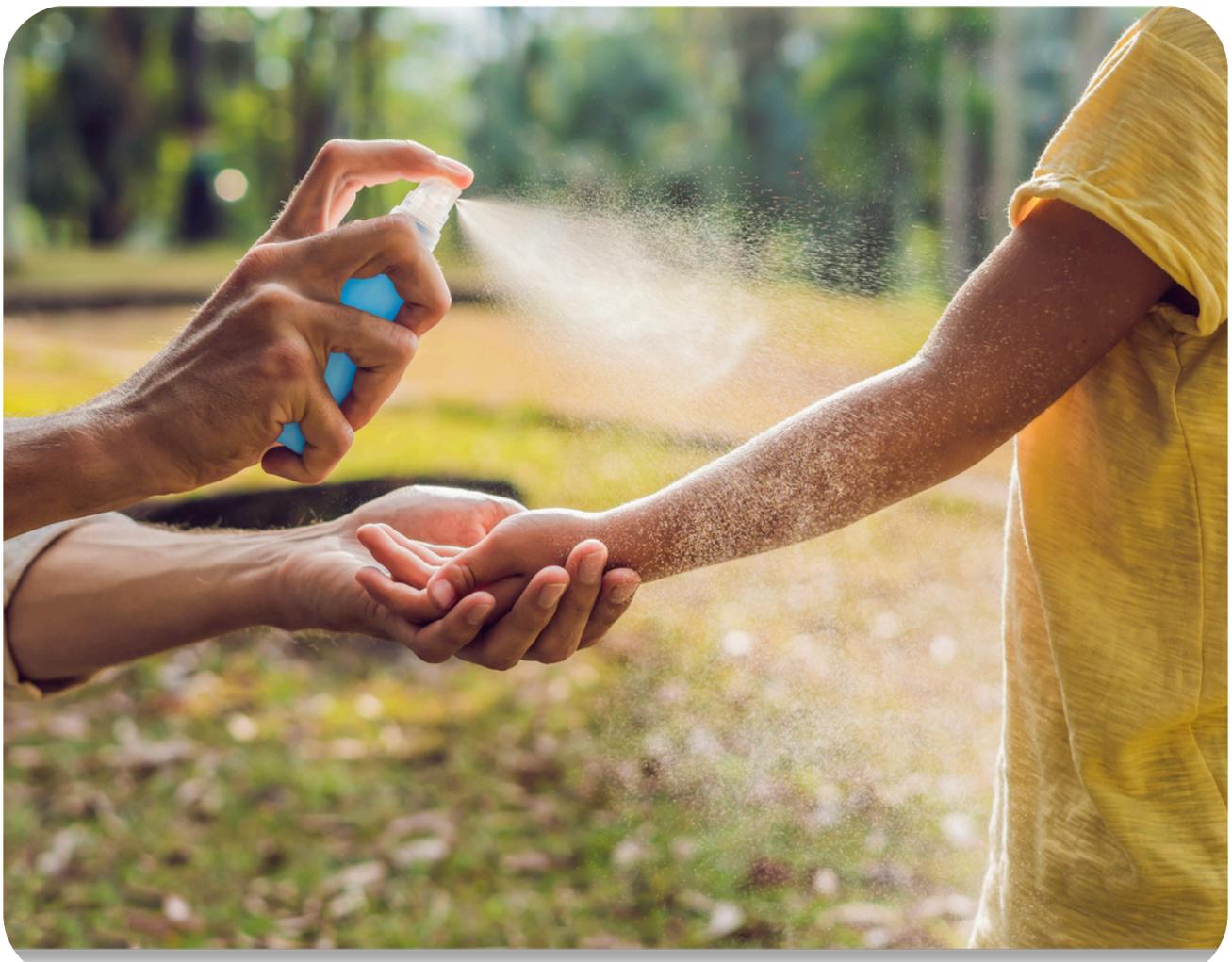




NO BITE ZONE!

A Brief Guide to Insect Repellents



Why Use Insect Repellents?

You can **prevent bites** from ticks, mosquitoes, and flies by using a repellent



Ticks and mosquitoes spread germs that can make people sick



Repellents make it harder for ticks and mosquitoes to find people to bite



Prevent bites to avoid diseases like Lyme disease or West Nile virus

Use repellent when you are outdoors in areas where ticks and mosquitoes live



Where do ticks and mosquitoes live?

**Ticks can be found in many places,
including your own backyard**

Check yourself for ticks after spending time in these areas



- Forests and woods
- Areas with lots of shrubs or tall grasses
- The edge of forests, trails, and roads
- Lawns and areas with dead leaves on the ground



**Mosquitoes lay eggs in places with
standing water**

Toss out standing water every week

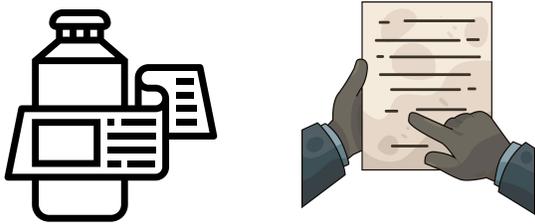
- Ditches, storm drains, and clogged gutters
- Pools and birdbaths
- Flower pots and buckets
- Old tires and trash



How to use repellent

1 Read the instructions

Always **follow the label instructions** for the repellent you are using



2 Apply a thin coat to exposed skin & clothes

Avoid putting repellent on cuts, wounds, or irritated skin



3 Follow these steps to safely apply repellent around your face and neck

First, spray repellent onto your hands.



Next, rub repellent onto your face, neck, and around your ears.



Avoid the eyes and mouth.



Last, wash your hands.

Adults should help kids use repellent safely



Common Questions / FAQ



Are repellents safe for kids?

Yes! Most repellents are safe for children.

Some **oil of lemon eucalyptus (OLE)** products and some para-menthane-diol (PMD) products should **not be used** on children **under age 3**.



Are repellents safe to use while pregnant?

Yes! EPA-registered insect repellents can be safely used during pregnancy and while breastfeeding.

Always follow label instructions on how to safely use insect repellents.



Can I use repellent on my pets?

No. Some repellents can be harmful to pets.

Only use repellents made for animals. Your veterinarian can help you choose the right product.



How can I use permethrin safely?

Only use permethrin on clothing and gear.

Spray permethrin on **clothes that are off your body** and in an **outdoor space**.

Let fabrics **dry completely** before using.

Never spray permethrin around pets.



Common Questions / FAQ



Can I use sunscreen and repellent at the same time?

Yes! If you want to use **both** sunscreen and repellent, **apply the sunscreen first**, wait **15 minutes** for it to set in, **then apply repellent**.

1



2



3



We recommend using **separate products**. Sunscreen + repellent **combination products** are not as effective for sun protection.



Do natural repellents work?

Maybe. Many natural repellents have not been reviewed for their safety or to show how well they work.



Some essential oil products can give short-term protection but might not work as well as EPA-registered repellents.

Citronella candles, bracelets, and clip-ons are not effective at preventing bites.



What is OLE? Is it a natural repellent?

Oil of lemon eucalyptus (OLE) is a plant-derived insect repellent. It comes from the lemon-scented gum tree. It is also sometimes called p-methane-3,8-diol, or PMD.

OLE is not the same as eucalyptus oil or lemon eucalyptus oil.



Resources



CDC Division of Vector-Borne Diseases

- Tips on how to prevent tick and mosquito bites
- Insect Repellent ChatBot
- <https://www.cdc.gov/vector-borne-diseases>



Environmental Protection Agency (EPA)

- Insect repellent ingredients and regulations
- Help choosing an insect repellent
- <https://www.epa.gov/insect-repellents>



Research Publications and References

- **The Effect of Sunscreen on the Efficacy of Insect Repellent: A Clinical Trial.** Murphy et al. 2000. <https://doi.org/10.1067/mjd.2000.107960>
- **Efficacy of Some Wearable Devices Compared with Spray-On Insect Repellents for the Yellow Fever Mosquito *Aedes aegypti*.** Rodriguez et al. 2017. <https://doi.org/10.1093/jisesa/iew117>
- **Efficacy of Unregulated Minimum Risk Tick Repellent Products Evaluated with *Ixodes scapularis* Nymphs in Human Skin Bioassay.** Burtis et al. 2024. <https://doi.org/10.1186/s13071-024-06146-3>
- **Insect Repellents: An Updated Review for the Clinician.** Nguyen et al. 2023. <https://doi.org/10.1016/j.jaad.2018.10.053>
- **Mosquito repellents for the traveller: does picaridin provide longer protection than DEET?** Goodyer and Schofield. 2018. <https://doi.org/10.1093/jtm/tay005>
- **MotherToBaby Fact Sheets: Insect Repellent.** Organization of Teratology Information Specialists (OTIS). 2024. <https://www.ncbi.nlm.nih.gov/books/NBK582767/>
- **Repellent Efficacy of 20 Essential Oils on *Aedes aegypti* Mosquitoes and *Ixodes scapularis* ticks in contact-repellency assays.** Luker et al. 2023. <https://doi.org/10.1038/s41598-023-28820-9>
- **Consumer Reports - Skip Products That Combine Sunscreen with Insect Repellent.** 2025. <https://www.consumerreports.org/health/insect-repellent/skip-products-that-combine-sunscreen-with-insect-repellent-a3520216047/>
- **Consumer Reports - What's Really in Your Insect Repellent.** 2022. <https://www.consumerreports.org/health/insect-repellent/which-insect-repellent-ingredients-are-most-effective-a9746785695/>
- **Consumer Reports - Some Mosquito Repellents Aren't Effective.** 2017. <https://www.consumerreports.org/insect-repellent/some-mosquito-repellents-are-not-effective-study/>



Which Repellent is Right for Me?

	DEET	Picaridin	IR3535	OLE (Oil of Lemon Eucalyptus)	Permethrin
Common Brands*	Ben's Coleman Cutter OFF! Repel Sawyer	Avon SkinSoSoft Ben's Scent Free Natrapel OFF! Clean Feel Ranger Ready Repel Tick Defense Sawyer	Avon Skin So Soft Coleman SkinSmart Citter Skinsations Zevo	Coleman Botanicals Cutter OLE Natrapel OLE Murphy's Naturals Repel OLE	Ben's Clothing & Gear Insect Shield Repel Clothing & Gear Sawyer Permethrin
How Long Does it Last?	2 - 8 hours**	4 - 14 hours**	2 - 8 hours**	6 hours**	6 washes or 6 weeks
What Concentration?	25 - 30%**	10 - 20%	10 - 20%	30%	0.5% for use on clothing
Safe for Kids?	Safe for children 2 months or older with adult supervision	Safe for children 2 months or older with adult supervision	Safe for children 3 years or older with adult supervision	Safe for children 3 years or older with adult supervision	All ages can wear treated clothing
How to Use	<ul style="list-style-type: none"> ✔ Follow label instructions on how to apply and re-apply. ✔ Put a thin coat on exposed skin and clothes. ✔ Spray on hands, then rub around face, ears, and neck. ✔ Adults apply repellents for children. 	<ul style="list-style-type: none"> ✘ Do not apply under clothes. ✘ Do not use on irritated skin. ✘ Do not spray directly into face. 	<ul style="list-style-type: none"> ✔ Use on fabrics. ✔ Follow instructions. ✘ Do not use on skin. ✘ Do not use near pets. 	<ul style="list-style-type: none"> ✔ Use on fabrics. ✔ Follow instructions. ✘ Do not use on skin. ✘ Do not use near pets. 	
What Can It Repel?***	Mosquitoes, ticks, fleas, biting flies, chiggers			Mosquitoes, ticks, fleas, biting flies, chiggers, human lice	Mosquitoes, ticks, fleas, biting flies, chiggers, human lice

* The use of brand names and/or any mention or listing of specific products is for educational purposes only and does not imply endorsement by the Northeast Regional Center for Excellence in Vector-Borne Diseases or our partners, nor discrimination against similar brands, products, or services not mentioned.

** Duration of product depends on the concentration of the active ingredient. **Follow label instructions for how often to re-apply the product.** DEET concentrations reach top effectiveness at 30%.

*** Products with lower concentrations of active ingredients may not be as effective at repelling ticks. Follow label instructions for best protection.



Visit the EPA website for more info