

The Alcohol Flush Response

WHEN DRINKING ALCOHOL OR USING NICOTINE PRODUCTS (CIGARETTES OR E-CIGARETTES), OUR BODIES ARE EXPOSED TO ALDEHYDES.



THESE ALDEHYDES CAN BE TOXIC TO OUR BODIES; PARTICULARLY IF THEY CAUSE FACIAL FLUSHING AND AN INCREASED HEART RATE.

WHY DOES ALCOHOL FLUSHING OCCUR MORE OFTEN IN THE EAST ASIAN POPULATION AND WHAT ARE THE HEALTH RISKS?



SOCIAL GATHERINGS ARE OFTEN PAIRED WITH DRINKING OR SMOKING. SOME PEOPLE, WHEN DRINKING ALCOHOL, SHOW A PHENOTYPE OF FACIAL FLUSHING; DUE TO THE ACCUMULATION OF THE ALCOHOL METABOLITE, ACETALDEHYDE.



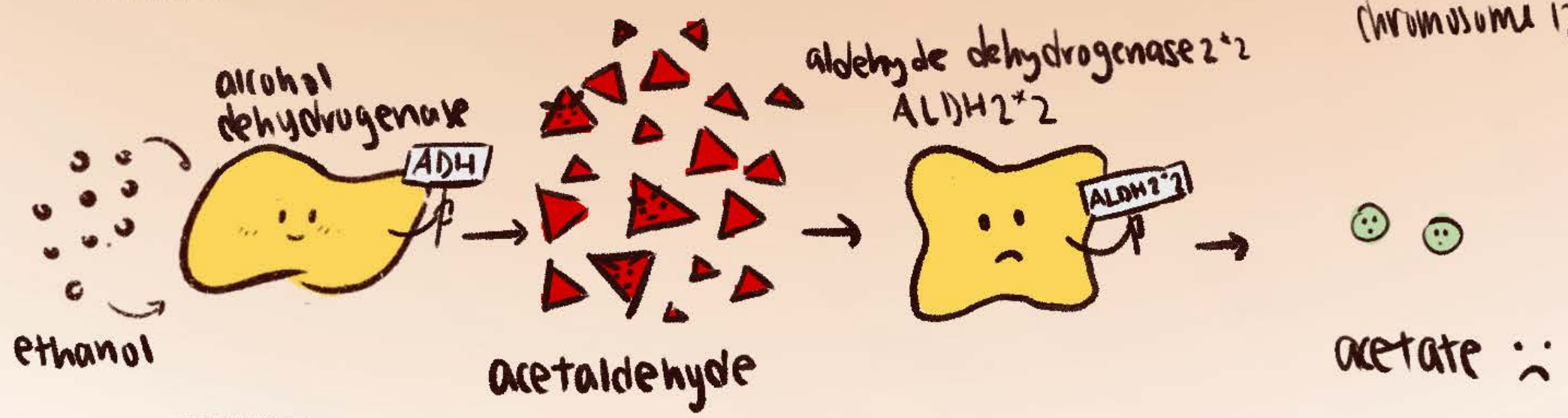
NEARLY 20% OF PEOPLE USE ALCOHOL AND CIGARETTES TOGETHER¹. NICOTINE PRODUCTS (CIGARETTES AND E-CIGARETTES) ALSO CONTAIN ALDEHYDES, INCLUDING ACETALDEHYDE^{2,3}.



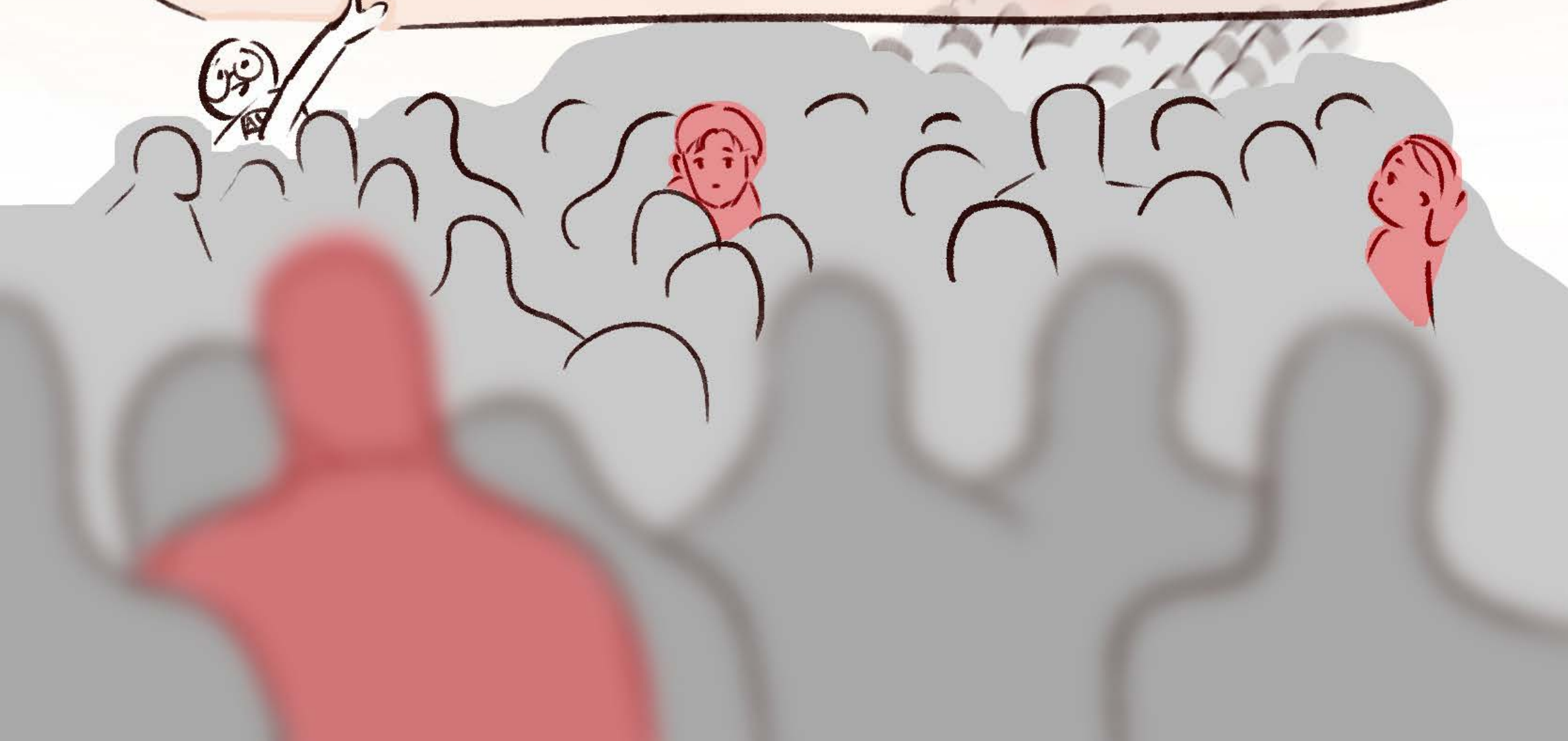
PEOPLE WITH GENETIC DEFICIENCIES FOR METABOLIZING ALDEHYDES CAUSED BY ALDH2 VARIANTS EXPERIENCE FACIAL FLUSHING AND AN INCREASED HEART RATE



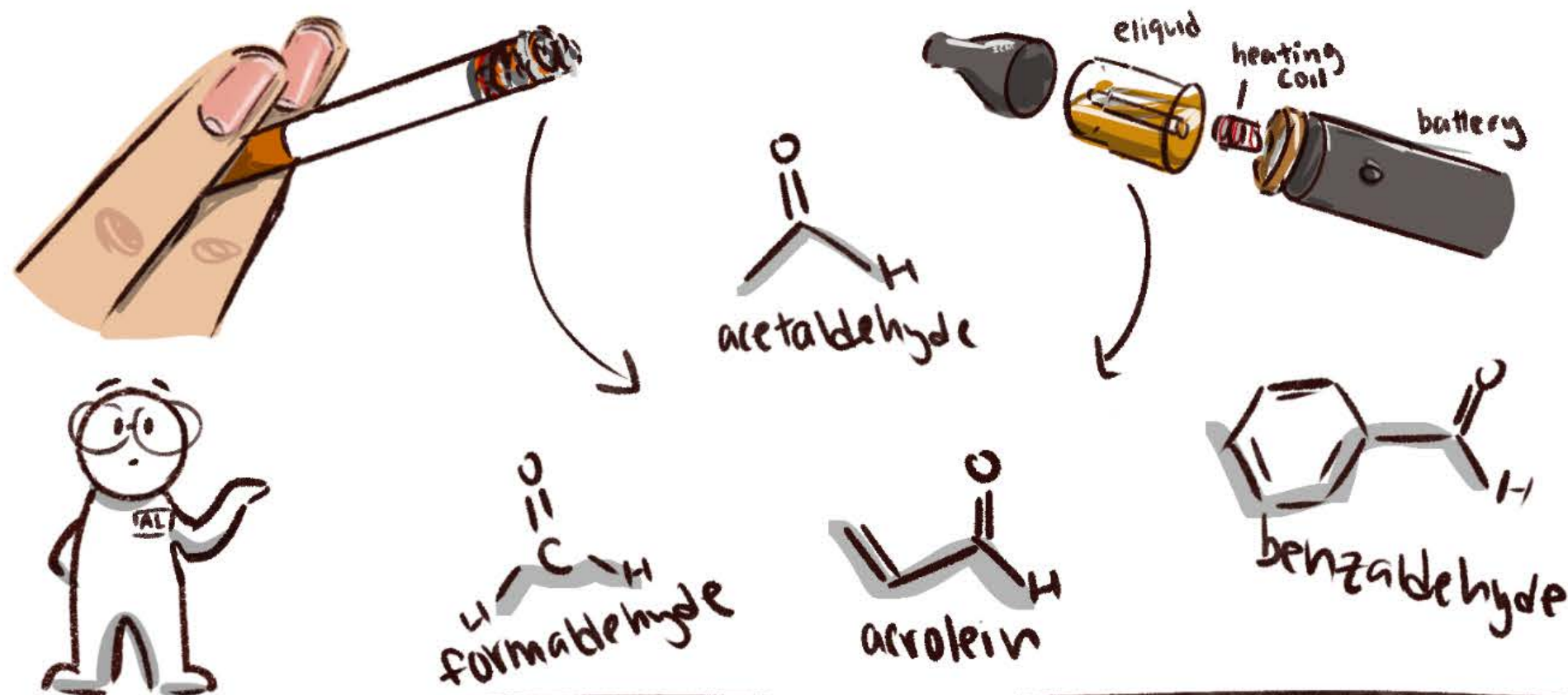
THE ALDH2*2 GENETIC VARIANT IS ONE OF THE MOST COMMON GENETIC VARIANTS IN THE WORLD, AFFECTING ABOUT 560 MILLION (8% OF THE WORLD POPULATION) MAINLY OF EAST ASIAN DESCENT.



ONE COPY OF AN ALDH2*2 GENETIC VARIANT IS NEEDED TO CAUSE AN ALCOHOL FLUSH RESPONSE. THEREFORE, AN ALDH2*2 CARRIER CANNOT EFFICIENTLY METABOLIZE ALDEHYDES - LEADING TO FACIAL FLUSHING, ELEVATED HEART RATE, AND ALDEHYDE ACCUMULATION.



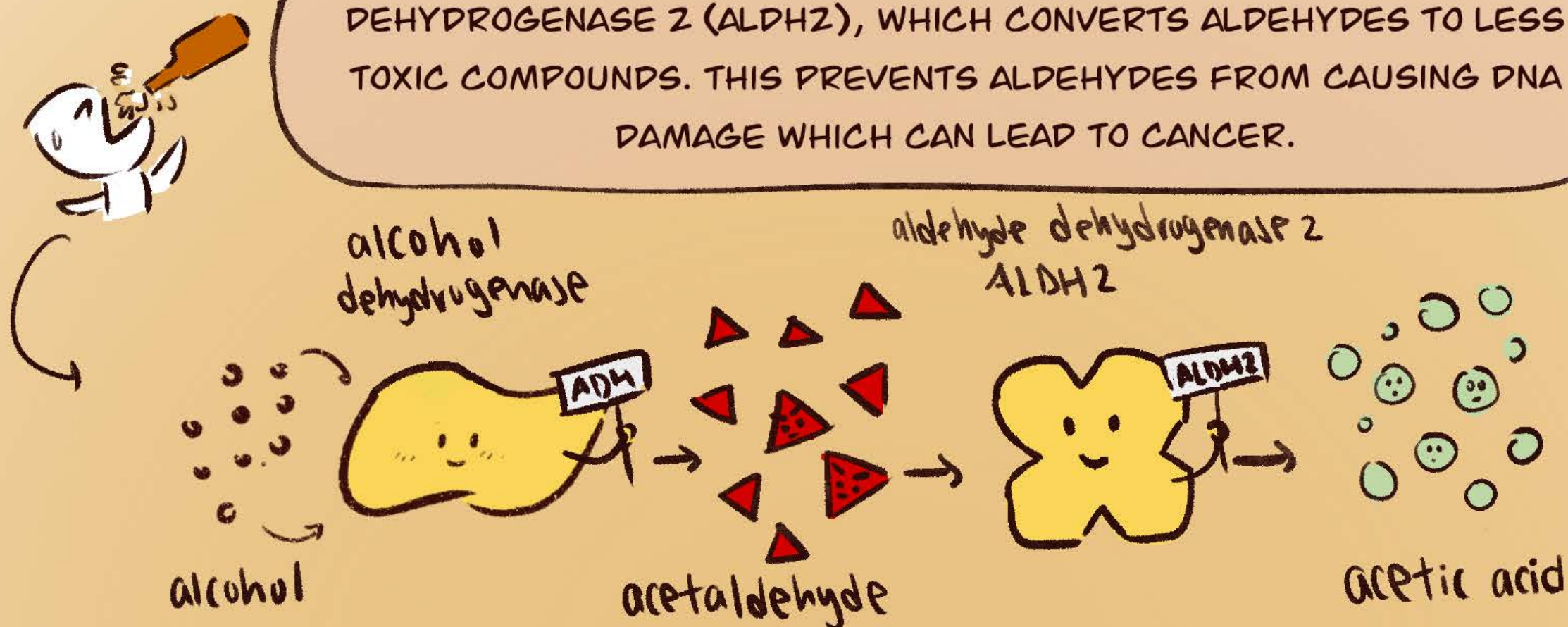
IMPORTANTLY, NICOTINE PRODUCTS (TOBACCO AND E-LIQUIDS) RELEASE ALDEHYDES INCLUDING ACETALDEHYDE, FORMALDEHYDE, AND ACROLEIN. FLAVORINGS, SUCH AS BENZALDEHYDE OR VANILLIN ARE ALSO ALDEHYDES.



USING ALCOHOL AND NICOTINE TOGETHER CAN RAISE ALDEHYDE LEVELS IN THE BODY TO A HIGHER LEVEL THAN USING EITHER ALONE⁴. ELEVATED ALDEHYDE LEVELS CAN HAVE ADVERSE EFFECTS IN PEOPLE WITH GENETIC DEFICIENCIES FOR METABOLIZING ALDEHYDES.



OUR BODIES BREAK DOWN ALDEHYDES USING THE ENZYME, ALDEHYDE DEHYDROGENASE 2 (ALDH2), WHICH CONVERTS ALDEHYDES TO LESS TOXIC COMPOUNDS. THIS PREVENTS ALDEHYDES FROM CAUSING DNA DAMAGE WHICH CAN LEAD TO CANCER.

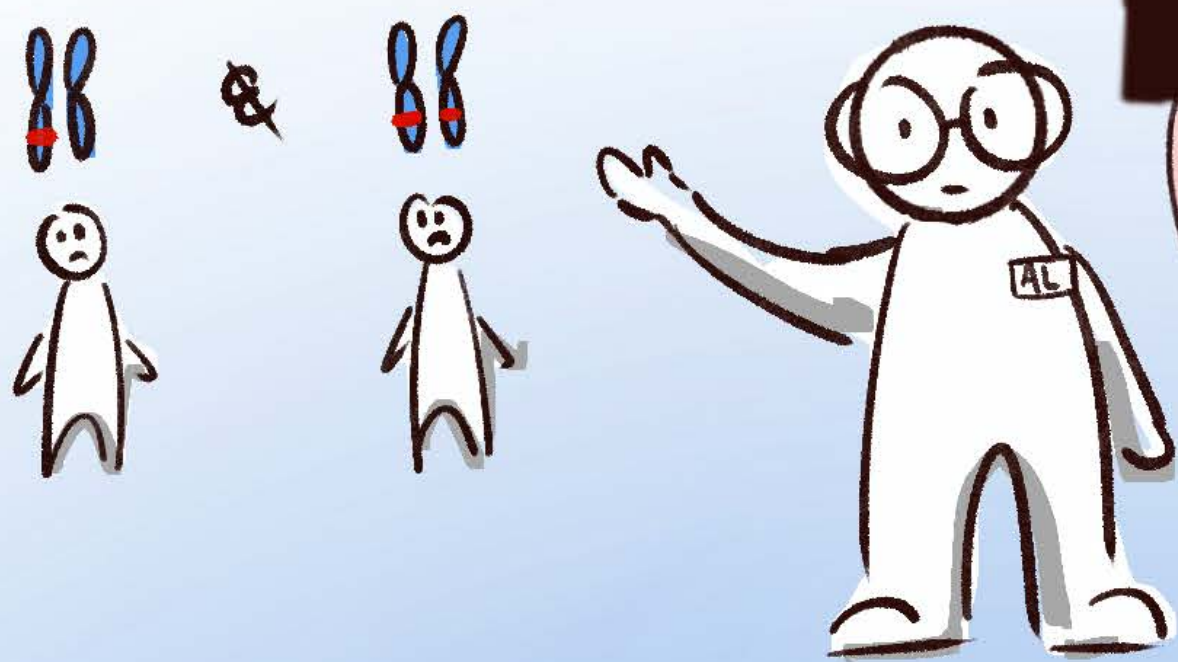


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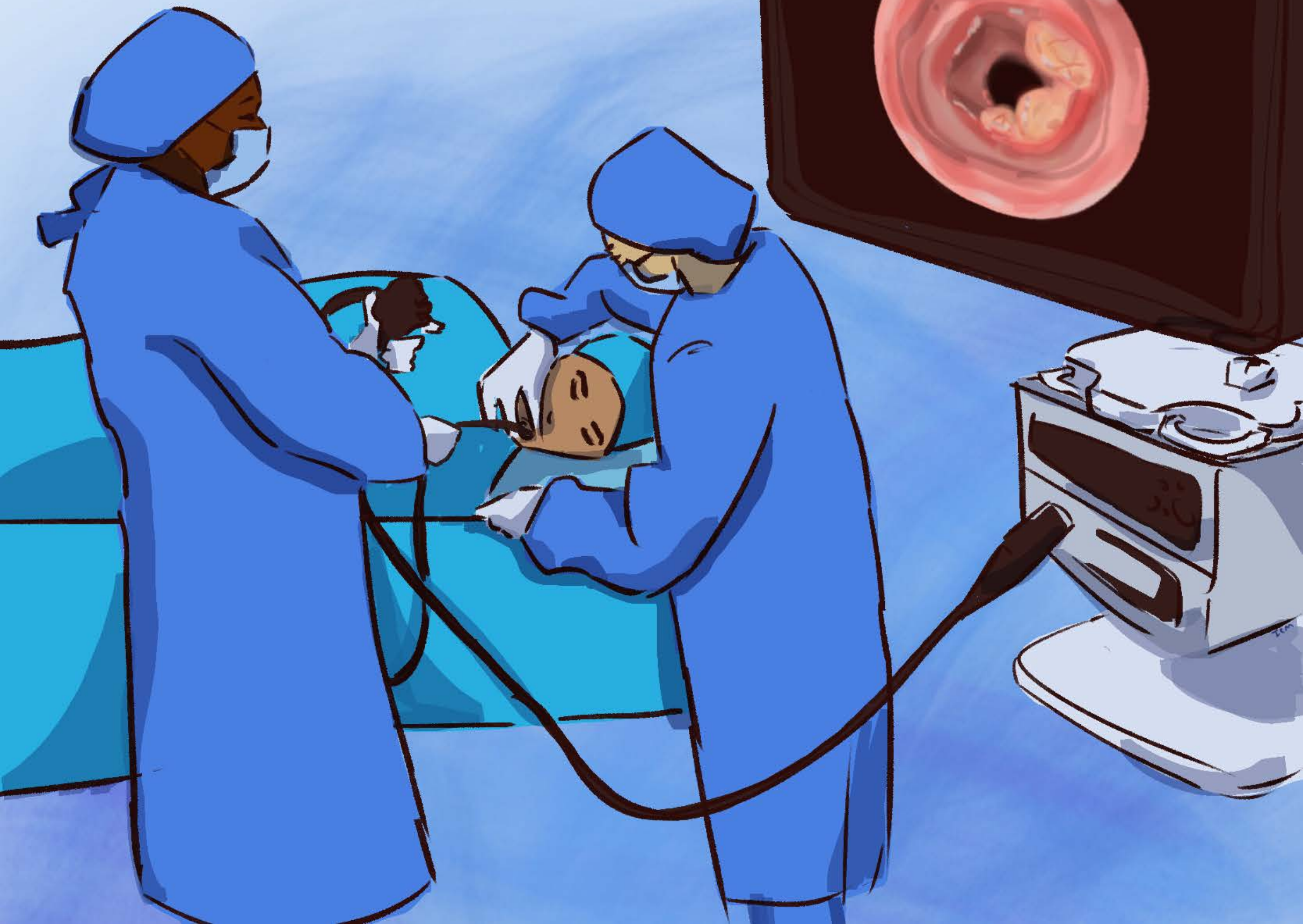
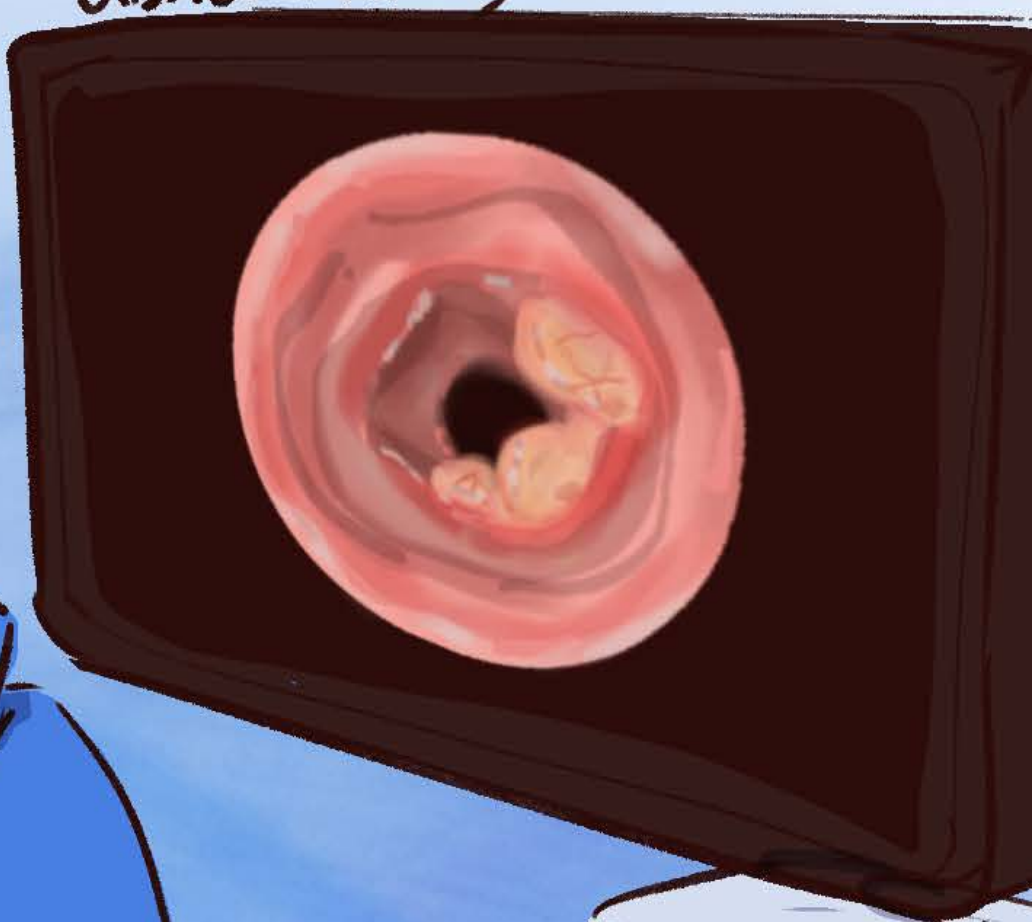


PEOPLE WHO CARRY AN ALDH2*2 VARIANT ARE AT HIGHER RISK FOR SEVERAL CANCERS, IN PARTICULAR ORAL, PHARYNGOLARYNGEAL, AND ESOPHAGEAL CANCERS^{5, 6, 7}.

ONE WAY TO LOWER THIS RISK IS TO STOP USING ALCOHOL, CIGARETTES AND E-CIGARETTES.



abnormal



IF YOU OR OTHERS YOU KNOW SHOW SIGNS OF FACIAL FLUSHING AND INCREASED HEART RATE WHEN USING ALCOHOL, CIGARETTES OR E-CIGARETTES, YOU SHOULD LIMIT YOUR CONSUMPTION TO LOWER YOUR RISK OF UPPER AERODIGESTIVE TRACT AND ESOPHAGEAL CANCER.



IT IS IMPORTANT IN THE ERA OF PRECISION MEDICINE TO BE AWARE THAT NOT EVERYONE'S RESPONSE TO ALDEHYDES IS THE SAME. THE EXPOSURE TO ALDEHYDES FROM ALCOHOL AND CIGARETTES IS A GREATER HEALTH RISK FOR THOSE WHO CARRY AN ALDH2*2 GENETIC VARIANT.

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