



Alcohol, Drugs and Impairment Division – NATIONAL SAFETY COUNCIL

Position Statement

Medication Pictograms to Reduce Drug-Impaired Driving

Position

The Alcohol, Drugs and Impairment Division (ADID) of the National Safety Council (NSC) recommends medication safety pictograms from an impairment-risk classification system that is effectively displayed on medication packaging and containers to reduce injury and death from drug-impaired driving. A pictogram is a visual presentation of a concept or idea often used to convey a warning or safety message to a wide audience.

Medication safety pictograms on product packaging would be another tool to effectively alert the consumer to the risk of potential impairment from the medication on driving and related tasks. The use of such pictograms would support a *Safe System*^{1,2} paradigm and *The Road to Zero*^{3,4} culture “to think differently about individual and collective choices” with the preventative measure to reduce injury and death from drug-impaired driving. The position can augment or stimulate discussion(s) between patients, pharmacists, and physicians or other medication prescribers on drug-impaired driving. It would also expand training practices on drug-impaired driving for the latter two professions, and other related training programs.

Use of medication safety pictograms would enhance information already provided by other means such as on product packaging, package inserts, and information conveyed by pharmacists, physicians, and other designated healthcare professionals.

Background

A popular adage is “a picture is worth a thousand words.” The United States (U.S.) Pharmacopeia (USP) defines pictograms as, “Images representing proper ways to take or store medications, precautions, or other important information about a medication that a health care provider should provide to his or her patient.”⁵ The U.S. Food and Drug Administration (FDA) informs, “The use of pictograms is voluntary in drug product labeling.”⁶

Malhotra et al. (2023) conveyed that medication pictograms “have been shown to capture attention, increase medication understanding, and enhance medication adherence and recall among patients.”⁷ Pictograms are expected to generally increase understanding and adherence to medication instructions in persons with significantly-reduced language skills (e.g., literacy) or those having a different primary language than those of the written instructions.^{5,8} Harzand-Jadidi et al. (2023) “identified 22 categorization/labeling systems regarding medicines and driving.”⁹

Wang and Voss (2020) found 48 of 56 studies (January 2008 through May 2019) significantly supported the effectiveness of pictograms in improving patient education outcomes, and advised “implementing pictographs into patient education is a promising approach for better information understanding and health management,”¹⁰ which further adds to other supportive review findings.^{11,12}

A U.S. National Roadside Survey was conducted on 7405 drivers with potentially-impairing prescription medications that a health care provider or pharmacy staff warned might affect their driving.¹³ Prescription dietary and appetite-suppressant medications contained the fewest warnings for 37.6% of drivers and sleep aids contained the most warnings for 83.8% of drivers. Pertaining to a warning label cautioning the same, these drivers reported receiving a warning on 36.4% (barbiturates) to 85.7% (muscle relaxants) of medications. Kirley et al. (2023) in a National Highway Traffic and Safety Administration (NHTSA) report informed, "Due to the prevalence of driver use of potentially impairing prescription medications and the lack of reported education given to drivers regarding the medications' potentially impairing effects, there is an opportunity for intervention."¹⁴ and, "More generally, education can also include use of clear warning labels on drug packaging or State PSAs." The use of medication pictograms would be expected to improve warnings to drivers on medications concerning impaired driving.

The International Pharmaceutical Federation (FIP) issued guidelines in 2014 to pharmaceutical organizations and pharmacists on "*The Supply of Medicines Affecting Driving Performance*" with information on driving-related impairment.¹⁵ Merks et al. (2021) identified "the need for health-care providers to move beyond the traditional didactic methods of oral and verbal communication with patients regarding medication-taking behavior"¹⁶ by the use of pictograms, especially for patients with risk factors of medication non-adherence (e.g., cultural, social economic status, age).

The European Initiative on Driving Under the Influence of Drugs, Alcohol and Medicines (DRUID) issued their final series of four reports in 2011 establishing a framework, categorization and labelling system for medicines and driving.¹⁷⁻²¹ Following review, "nearly half of the 1541 medicines were categorized 0 (no or negligible influence on fitness to drive), about 26% were placed in category I (minor influence on fitness to drive), and 17% were categorized as II or III (moderate or severe influence on fitness to drive)."²² This multinational initiative and their reports provide a solid foundation to encourage use of medication pictograms that are conceptually connected with increased risk of impaired driving.

De Gier et al. (2024) reported implementation of DRUID outcomes and/or FIP guidelines in only 5 of 23 respondent countries from Europe (France, Germany, Netherlands, Spain, Switzerland) with a response rate of 50%.²³ Additional countries reportedly using medication safety pictograms for drivers include Australia²⁴ and Japan.²⁵ There are currently 195 countries, and therefore a long journey for incorporating an additional tool of medication pictograms to reduce drug-impaired driving.

Sweden discontinued using the medication pictogram. The Medical Products Agency of Sweden informed, "Until July 1, 2005, medicines classified as narcotic drugs had a red warning triangle on their packaging. [...] The warning triangle label was a signal that the medicine could affect, among other things, the ability to drive cars and other vehicles. [...] the warning triangle was an easy way to get an important message across".²⁶ The "rationale for removing the warning triangle from the labelling requirements for medicinal products for human use" was twofold: (a) "Providing false reassurance [...] there was a risk that the warning triangle could give a false sense of security. People taking a medicine without a warning triangle could easily believe that it could in no way affect their driving ability." (b) "Losing its value [...] if all medicines that had a risk of affecting a person's driving ability were to be labeled with a warning triangle, the warning triangle would lose its value as a warning signal."²⁶ The Swedish experience is a consideration for other countries in developing a medication pictogram system to reduce drug-impaired driving.

However, in the U.S., a AAA Foundation for Traffic Safety study on "*Countermeasures Against Prescription and Over-the-Counter Drug-Impaired Driving*" involved an expert panel that rated over 60 countermeasures with the second highest-rated as "Include a symbol/graphic on the prescription label (move toward European style)."²⁷ The U.S. National Safety Transportation Board subsequently recommended action to the U.S. Food and Drug Administration of, "Conduct a study to understand how prescription drug labeling and over-the-counter drug labels could be modified to increase user understanding and compliance with driving-related warnings; publish the study

findings.”²⁸ Medication safety pictograms would be expected to be within the recommended study. Preliminary concerns include: adding a pictogram could distract from other critical label information; different cultural groups may have different interpretations of pictograms; and there are many risks with medications and many groups could argue their risk factor of interest should have a pictogram.

While medication safety pictograms are classified according to their general intrinsic risk to driving, additional effort is required to address the increased risk in patient specific areas of prescription medication. These include during the initial weeks after starting medication treatment,²⁹ significant changes in dose regimen,²⁹ tolerance to treatment,³⁰ polypharmacy,³⁰ and further individual-specific assistance.³¹ Medication safety pictograms would not account for individual variability.³² No study was found that clearly compared the prevalence of drug-impaired driving before and after the implementation of medication pictograms in several countries. A general pitfall in available studies on pictograms in healthcare is the heterogeneity that hampers direct comparisons of studies and meta-analyses.³³

Medication pictograms for impaired driving are consistent with a *Safe System* approach, which is “the guiding paradigm to address roadway safety” for the 2022 U.S. Department of Transportation’s National Roadway Safety Strategy (NRSS). The NRSS has six principles: Death and serious injury are unacceptable; humans make mistakes; humans are vulnerable; responsibility is shared, safety is proactive; and redundancy is crucial.^{2,34}

Fierro et al. (2013) found “the presence of the pictogram on medication packaging may play a fundamental role in changing drivers’ attitudes (83.9% of the drivers would reduce their driving frequency)”³⁵ and concluded on the Spanish pictogram as “a tool to improve prescribing and dispensing procedures of medicines that impair driving as well as an instrument to make patients aware of the role of medicines play in traffic safety.” The correct interpretation of the Spanish safety medication pictogram and driving was found to decrease with subject age and increase with higher educational level.³⁵ Monteiro et al. (2013) concluded “pictograms evaluated in this research provided good insight into the different levels of driving risks, especially the rating model pictogram, because respondents’ intentions to change their driving behaviors increased with higher categories of risk.”³⁶

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