Study finds 'Traffic Light' tool used by GPs to assess seriously unwell children is 'unreliable'

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A tool used by GPs to help identify seriously unwell children may not

accurately detect or exclude acute illness, according to an evaluation using data from UK general practice.

The study, led by Cardiff University, assessed data from more than 6,700 cases and concluded the widely used National Institute for Health and Care Excellence (NICE) Traffic Light system "cannot be relied upon" and is "unsuitable" for use as a clinical decision tool.

The findings are published in the *British Journal of General Practice*.

Lead author Amy Clark, a final-year medical student at Cardiff University, said: "Our study found the tool on its own cannot identify, with sufficient accuracy, those children who have a serious illness, nor those who can safely be managed at home. An accurate primary care tool is vital to help GPs make the right decision to ensure unwell children receive the care they need, while avoiding unnecessary hospital admissions.

"Further research is now needed to update or replace this tool. The need has become even more pressing during the COVID-19 pandemic, especially following the relaxation of restrictions which has led to an increase in respiratory illness among young children and high demand for emergency care, despite many not being seriously ill."

Children account for around 40% of the average GP's workload, with under-fives being seen on average six times per year. More than two million children under five attend hospital emergency departments every year.

To help GPs assess children, NICE created the Traffic Light tool which groups symptoms into green, amber, or red, corresponding to low (manage at home), intermediate (can be referred to hospital or sent home with advice), or high risk of serious illness (refer urgently to

hospital).

The tool, used to assess unwell children under-five, has been in use for 15 years. Previous studies have evaluated its use in children already in hospitals, but this is the first study to assess its accuracy using data from children consulting in UK general practice.

The researchers linked data from GPs and hospital admissions for 6,703 children in England and Wales to assess whether their traffic light category matched the severity of their illness. The primary outcome of interest was a hospital-diagnosed serious illness within seven days of visiting the GP.

They found:

- Around 32% (2,116) of children were categorized as red—but only 0.5% (10) of these had a serious illness requiring hospitalization;
- The majority of children were categorized as amber—about 63% (4,204) and only 6% (383) were labeled green;
- The tool's red category had a sensitivity (the ability of the tool to correctly identify children admitted to hospital with serious illness) of 58.8% and specificity (the ability of the tool to correctly identify children without hospital admission with serious illness) of 68.5%;
- Combining the red and amber categories improved the sensitivity to 100% (however did reduce specificity to just 5.7%);
- Overall, the incidence of serious illness in children presenting to general practice is low, at just 0.3%.

"Our research suggests that if GPs had followed the NICE Traffic Light tool, they would have referred a third of all children (those categorized as 'red') urgently to hospital, despite most of these children having a mild

self-limiting illness," said Ms. Clark.

"Using 'red' or 'amber' as the threshold would ensure that no seriously ill children were missed, but at the cost of referring a substantial number of children to hospital."

Dr. Kathryn Hughes, co-author on the study and senior clinical lecturer at Cardiff University's School of Medicine, said: "It was really surprising to us that this tool has never been validated in UK general practice, despite being recommended by guidelines since 2007. Accurate assessment in general practice is also vital to ensure secondary care services can function effectively."

Ms. Clark added: "We believe our results are important not just for GPs, but also trainees and students who are often taught this assessment system during their training. A new, more accurate, system could help junior healthcare professionals gain confidence assessing unwell children ."

More information: Accuracy of the NICE Traffic Light system for detecting serious illness in acutely unwell children presenting to general practice: a retrospective cohort study *British Journal of General Practice*. DOI: doi.org/10.3399/BJGP.2021.0633

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