

Researchers develop tool to simplify diagnoses for children facing medical complexities

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Too often, contends UMass Lowell faculty researcher Brenna Morse, children with complex chronic medical conditions spend days in the hospital undergoing tests for what could be a simple diagnosis.

The challenges include, she says, some [children](#) with medical complexities, such as severe neurological conditions and functional impairments, cannot easily signal that they are in pain or point where in their body it is located. Where children not facing such a challenge might be able to have a medical issue resolved with a simple visit to their primary care doctor, others end up hospitalized and going through days of costly testing to arrive at similar diagnoses.

Morse, a UMass Lowell graduate and current nurse of children with complex conditions who has been a faculty member in the Solomont School of Nursing since 2015, and a team of researchers from Boston Children's Hospital have developed a method through which health-care providers can more readily identify the medical issue being experienced by a child who cannot communicate it on their own. Called GRASP (which stands for Guidelines for Ruling out and Assessing Pain), the tool allows providers to more efficiently evaluate pain among children who cannot easily communicate they are in pain or indicate the pain location. The big takeaway, Morse says, is that the method can help find the source of pain in a patient among a population of children who experience pain that is more intense and frequent than others, and therefore help treat it more readily.

"We're hoping this can be a tool to help children avoid long hospitalizations," said Morse. "We can find [the problem] and treat it and improve their life, avoid prolonged pain, surgeries, and perhaps save them."

Morse and the team developed GRASP through almost a decade of research, beginning when Morse was earning her Ph.D. and continuing

through her work as an academic researcher. The Children's Hospital researchers who collaborated with Morse include Jean Solodiuk (nurse manager and scientist, Department of Anesthesiology, Critical Care and Pain Medicine), Christine Greco (acting chief, Division of Pain Medicine), Sangeeta Mauskar (director, Complex Care Inpatient Program) and Julie Hauer (complex care and pediatric palliative care physician).

"In my experience as a physician, taking care of kids with complexity and multisystem involvement, dealing with pain in a nonverbal child is one of toughest clinical dilemmas. The creation of the GRASP tool has given us a systematic approach for pain work-up. I am hoping that with the use of this tool for work-up, we will have a thoughtful approach for pain work-up and in turn will have less burden on families in the long run," said Mauskar.

The research included surveys and focus groups to develop the tool and help determine how accessible and effective GRASP could be for health-care providers. The most recently completed parts of the project were funded by a UMass Lowell seed grant.

The results were recently published in *Hospital Pediatrics*, a journal by the American Academy of Pediatrics. Morse's goal, she says, is to see more providers trained in using GRASP so that more children with complex conditions may have their pain adequately addressed so that they may be well and enjoying time with their families, in school and in their own community instead of in the hospital.

"First-person accounts of symptoms are an important part of diagnosing because they guide the physical exam and evaluation. Children with medical complexity often cannot communicate their account of symptoms because of neurologic conditions and functional impairments. GRASP is a checklist developed for children with medical complexity

that guides clinicians to consider a comprehensive list of differential diagnoses with suggestions of further evaluation if needed," said Solodiuk. "GRASP has the potential to improve diagnostic accuracy in children with medical complexity and decrease the time it takes to identify the cause of the [pain](#)."

More information: Brenna L. Morse et al. Initial Validation of GRASP: A Differential Diagnoses Algorithm for Children With Medical Complexity and an Unknown Source of Pain, *Hospital Pediatrics* (2020). DOI: [10.1542/hpeds.2019-0322](https://doi.org/10.1542/hpeds.2019-0322)

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