

New insight into life-threatening childhood brain cancer

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The most common type of malignant childhood brain cancer has been identified as seven separate conditions each needing a different treatment, new research has revealed.

A study by Newcastle and Northumbria universities has found that childhood medulloblastoma can be separated into seven different subgroups which all have their own biological and clinical characteristics.

It is hoped that this finding, published today in *The Lancet Oncology*, will give young patients access to better [treatment](#) programmes tailored to their needs and new drug options in the future.

Up until now there had only been four recognised molecular subtypes. Experts say this new understanding could lead to increased survival rates as each responds differently to treatment so can be targeted individually.

It is anticipated this discovery will help personalise treatment so that young patients get the best care possible, tailored to the specific biology of their [cancer](#).

Gentler therapies could be used for children with a good prognosis, while reserving the most intense treatments for those with high-risk tumours, as well as developing new treatments.

Steve Clifford, Professor of Molecular Paediatric Oncology at the

Wolfson Childhood Cancer Research Centre, Newcastle University, has led the research.

He said: "Medulloblastoma is the most common type of malignant paediatric [brain tumour](#) and it is a devastating condition that causes approximately 10 percent of all childhood cancer deaths.

"Our research has provided critical new insights into the cancer's molecular basis and it is a significant step forwards in enhancing our understanding of this life-threatening disease.

"This new discovery allows us to undertake studies to see how we could use these insights in diagnosis and to personalise treatments according to the biological features of each patient's tumour."

Insight into condition

Medulloblastoma is the most common brain tumour affecting young people. It is estimated that around 650 patients are diagnosed each year in the EU.

There is an urgent need for greater understanding into the condition in order to assign patients to the most appropriate treatment programme.

Children with this cancer are currently given a combination of surgery, chemotherapy and radiotherapy, but this course of action has numerous debilitating side effects, such as lower IQ and social problems.

The study looked at tumour samples from more than 700 children with medulloblastoma, together with clinical and disease details.

Analysis of each tumour assessed its genetic characteristics and identified unique biomarkers which the experts then compared with

clinical information, allowing them to establish that each subgroup has distinct clinical features and survival rates.

Dr Ed Schwalbe, Senior Lecturer in Bioinformatics and Biostatistics at Northumbria University, Newcastle, was the study's first author.

He said: "Excitingly, these new subtypes are characterised by better [survival rates](#) for some children but sadly also worse outcomes for some.

"This research could therefore lead to new clinical trials, to better help clinicians decide on optimal treatments for their patients, focusing on reducing treatment side effects in patients with a good prognosis, and continuing to aggressively treat patients with a worse prognosis."

Kinder treatment

Cancer Research UK and The Brain Tumour Charity provided funding for the study.

Dr Catherine Pickworth, Cancer Research UK's science information officer, said: "Improving the way we treat cancer is a priority, especially as many children who survive cancer will live with long-term side effects of their treatment.

"It's vital that we make treatment both better and kinder, and this study is a positive step forward in achieving this.

"By showing that different subgroups have different outcomes we can move towards giving treatment by subgroup, allowing doctors to use kinder treatments where possible and only resort to the more powerful ones where absolutely necessary.

"The next steps will be to look at which treatments help each subgroup

the best, so we can tailor treatment for every child with medulloblastoma."

Further research

Findings of the study will be used by the Newcastle University team, at the Wolfson Childhood Cancer Research Centre, for further research into childhood medulloblastoma.

They are looking to develop international clinical trials which test whether implementing these findings can improve diagnosis, treatments and outcomes.

They also want to further understand the biology of each subgroup so that scientists can begin to target them with specific therapies.

Neil Dickson, Vice Chair of The Brain Tumour Charity, said: "These findings are extremely encouraging and will enable more accurate diagnosis and appropriate treatment for those affected by medulloblastoma.

"This research was one of the first major projects made possible by our fundraising and investment as a charity.

"We are delighted that the research we are funding at Newcastle is having a positive impact for children and families facing this traumatic diagnosis and treatment."

More information: *The Lancet Oncology*:
[dx.doi.org/10.1016/S1470-2045\(17\)30243-7](https://doi.org/10.1016/S1470-2045(17)30243-7)

Provided by Newcastle University

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