

Case Report

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## Nursing care of a pediatric patient with an Astrocytoma using Dorothea orem's self-care theory.

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### Abstract

#### Keywords

Astrocytoma,  
craniotomy,  
nursing,  
Dorothea Orem's  
self-care theory

We report the case of a 16 years old female patient with astrocytoma following a craniotomy, detailing the nursing interventions given, based on Dorothea Orem's self-care theory. When the patient was hospitalized at the pediatric unit, we preformed the corresponding nursing evaluation, detecting that the patient had altered care needs, endangering her life, her functionality and her wellbeing. The nursing diagnosis was: risk due to ineffective tissue perfusion, nutritional imbalance and memory impairment. The nursing interventions were directed to monitoring the intracranial hypertension, the neurological impairment, the improvement of the food intake and cognition.

### Introduction

Astrocytic tumors (astrocytomas) are a group of intracranial neoplasms of the Central Nervous System (CNS) that appear at the brain parenchyma and that rarely causes metastases to other tissues. The prevailing cell of this type of tumors are derived from astrocytes that have become immortal. They constitute around 80% of the neuroepithelial tumors.

### Classification

The World Health Organization (WHO) established criteria for the classification of astrocytomas in four categories (grades) based on the tumor's histological characteristics.

**Grade I:** Low-grade astrocytoma. They are not frequent and usually have an excellent prognosis after

it's removal. They are more common in children than in adults.

**Grade II:** Proliferative astrocytoma. Together with grade one astrocytic tumors, they constitute around 6% of all reported brain tumors.

**Grade III:** Anaplastic astrocytoma. It's an infiltrating and diffuse tumor characterized its high proliferative potential and it disperse and poor cellular differentiation. It generally evolves from a low-grade astrocytoma although they can also be diagnosed without presenting a precursor tumor. They have the potential of progressing (and they often do) into a malignant glioblastoma. This grade of astrocytic tumors affects males more often than females, they also occur with more frequency in Caucasian populations and people between 50 and 60 years of age.

**Grade IV:** Glioblastoma multiforme (GBM). It's the more common malignant brain tumor, representing around 15% of all brain tumors. They usually affect both cerebral hemispheres and it usually is the most aggressive of all astrocytomas. The survival rate of patients with GBM is around 12 months when aggressive surgical treatment is provided jointly with chemotherapy and radiotherapy. Only around 3% of all the cases survive 5 years or more.

Low grades astrocytomas can recur as higher grades ones, more aggressively and more invasively.

### Location

Pilocytic astrocytoma: optic nerve, optic chiasm, hypothalamus, thalamus, basal ganglia, cerebral hemispheres, cerebellum, brainstem and spinal cord.

Pleomorphic xanthoastrocytoma: often located superficially in the temporal lobe.

Diffuse astrocytoma: frontal and temporal lobes, brainstem, spinal cord, optic nerve, optic tract, hypothalamus and thalamus.

Anaplastic astrocytoma and glioblastoma multiforme: They can develop in any area of the brain, cerebellum, brainstem and spinal cord.

### Symptoms

The symptoms of astrocytomas can vary greatly, depending on its location in the brain the area that is being affected by the tumor. The nature of the seizures that the patient presents can be an indication of the location of the tumor.

Patients can present vomit, headache, gait abnormalities, loss of balance, weakness or alterations to the senses. The symptomatology of this kind of tumors can overlap with that of other brain affections. The symptoms can be caused by the tumor invading the area responsible for the affected function, by edema that cause brain lesions or by pressure areas where the healthy surrounding tissue (to the tumor) has been compressed.

In small children, the increase of pressure of an astrocytoma inside the cranium can cause head enlargement and present edema. Generally, no changes in temperature, blood pressure, pulse or respiratory rate are present. Seizures happen more often with meningiomas, low grade astrocytomas and oligodendrogliomas than with malignant gliomas.

### Diagnostic

Neurological examination must be performed if the patient shows increasing signs of mental impairment, new seizures, persistent headaches or if there is evidence indicating an increase of the intracranial pressure (such as vomit, edema or a protrusion in the back of the eye). Diagnosing brain tumors often requires the use of magnetic resonance imaging, computed tomography scan, thorax radiograph and neuro-vascular angiographies.

### Treatment

The treatment of choice for all resectable tumors will be surgical together with concomitant chemotherapy and radiotherapy, particularly with the most aggressive tumors. For low grade astrocytomas, the removal of the tumor will the patient a functional survival for several years.

Para los astrocitomas de bajo grado, la remoción del tumor por lo general permitirá la supervivencia funcional por varios años.

### Prognosis

Survival rates for astrocytomas vary greatly, depending on the following factors: location of the tumor, grade of astrocytoma, age of the child, genetic factors, if it is the first time that the tumor has been diagnosed or if it has relapsed.

### Clinical Case and Methodology

We present the case of a 16 years old teenage girl that is admitted, with consent of her primary caregiver, to the pediatric unit of the Centro Médico Naval. A bibliographical inquiry was conducted, and a theoretical framework was created. We performed the nursing assessment using Dorothea Orem's model and NANDA-NIC-NOC's taxonomy for nursing diagnostic and intervention.

### Results

Nursing assessment is conducted finding clear alterations to her functionality and wellbeing because of the surgery that the patient underwent for the resection of tumor in the temporal-occipital regions; the prevention of life-threatening situations requirement is not met. The patient shows signs of

mild intellectual disability that impairs her learning abilities, she is overweight, has a highly caloric diet and is under treatment by the endocrinology unit of the Centro Médico Naval because she is insulin resistant.

Tras la realización de la valoración y la elaboración de los diagnósticos enfermeros acorde a las principales alteraciones del paciente, se realizan las intervenciones y se valoran los resultados de éstas en el paciente.

**Care plan**

After the nursing assessment and diagnosis, nursing interventions are administered, assessing their effectivity and effects on the patient.

Table 1: Nursing care plan

Diagnostic	NOC result	NIC interventions
00024 Ineffective tissue perfusion (cerebral) related to the surgery at the temporal-occipital region.	00912 Neurological status: Consciousness. Arousal, orientation, and attention to the environment.	2620Neurological Monitoring. Asses the patients conscious state using the Glasgow Coma Scale. Asses the motor function, the physical strength, the muscle tone, coordination end reflexes. Asses the sensitivity of the patient to rule out hemiparesis. Asses data of intracranial hypertension (Cushing's triad: systolic hypertension, bradycardia and bradypnea).
00001 Imbalanced nutrition: more than body requirements manifested by dysfunctional eating patterns, weight above height and age. Insulin resistant.	1008 Nutritional status: Food & Fluid Intake. Amount of food and fluid taken into the body over a 24-hour period.	1004 Nutricional status. Keeping a weight journal for weight control. Encourage healthy habits. Inform about the risks associated with being overweight. Capillary control of blood sugar level. Help the patient developing balanced nutrition programs.
00131 Impaired memory related to neurological disorder: mild intellectual disability manifested by decreased learning capabilities.	0900 Cognition. Ability to execute complex mental processes.	0905 Concentration. Memory training. Preform a calmed and slow approach when interacting with the patient. Speak clearly to the patient with an appropriate volume, rhythm and tone. Preform judgment exercises. ➤ Mental skill games, Concentration (game).

## Evolution

The patient was discharged without apparent complications of the pediatric unit due to improvement of her health on May 2 2018, showing good results of the interventions by the nursing personnel.

## Discussion

In this work we described the importance of the nursing work in the attention of a pediatric patient diagnosed with astrocytoma, using the scientific knowledge as a systematic guide through which the quality of the nursing care and attention is improved using Dorothea Orem's ideas as a theoretical base, highlighting the importance of the patient self-care and the importance of the interaction with the patient's family during this process.

For the improvement of the patient's quality of life the work of the nursing personnel is fundamental. For a quality nursing care and attention, good training and preparation is required. Increasing the knowledge of the personnel will improve the attention and cares

given to the patients and it will help minimize the secondary damages and complications that a pathology that affects de CNS causes.

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