

University of  
Colorado Hospital  
UNIVERSITY OF COLORADO HEALTH

# 2014 OUTCOMES

## NEUROSCIENCES



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# TABLE OF CONTENTS

---

- 4 // **Brain Tumor** Data
- 6 // **Cerebrovascular and Stroke** Data
- 8 // **Epilepsy** Data
- 9 // **Cognitive Disorder** Data
- 10 // **Movement Disorder** Data
- 12 // **Multiple Sclerosis** Data
- 13 // **Neurocritical** Data
- 14 // **Neuromuscular** Data
- 15 // **Neuro-Ophthalmology** Data
- 16 // **Spine** Data

# UNIVERSITY OF COLORADO HOSPITAL IS ONE OF THE LEADING ACADEMIC MEDICAL CENTERS IN THE NATION.

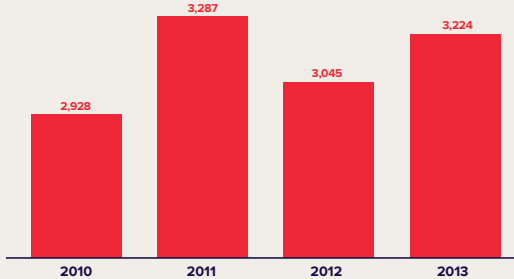
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Advancing medicine and achieving excellence in complex clinical care requires outstanding teamwork and collaboration of clinicians, researchers, staff and leaders. At the University of Colorado Hospital we are privileged to have such a team, all focused on the needs of the patient and engaged in excellence. University of Colorado Hospital is the largest provider of comprehensive neurological and neurosurgical care in the region. We lead the state in the amount and quality of care provided to patients with epilepsy, movement disorders, neuroimmunology/multiple sclerosis, neuro-oncology, behavioral neurology/dementia, neuro-ophthalmology and neuro-critical care. In 2013, we provided over 41,000 outpatient visits, and our neurosciences units accounted for 3,215 admissions, 1,971 major Neurosurgical and Spine procedures, and 16,068 patient days.

# BRAIN TUMOR DATA

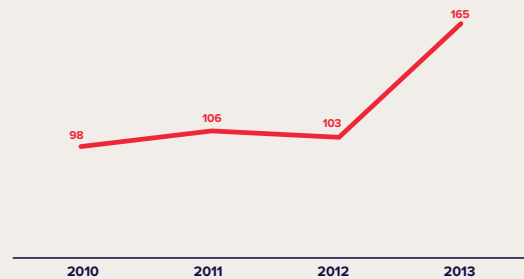


## BRAIN TUMOR OUTPATIENT VISITS



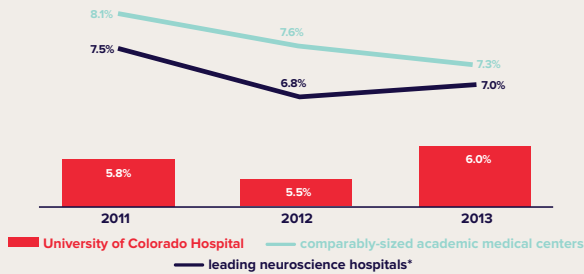
Source: UCH Finance

## GAMMA KNIFE PROCEDURES



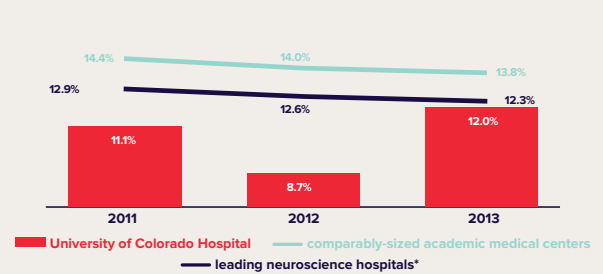
Source: CU Department of Neurosurgery

## 30 DAY READMISSION RATES - RELATED CAUSE



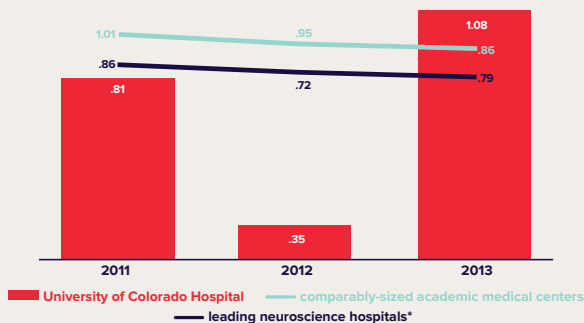
Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>. Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## 30 DAY READMISSION RATES - ALL CAUSE



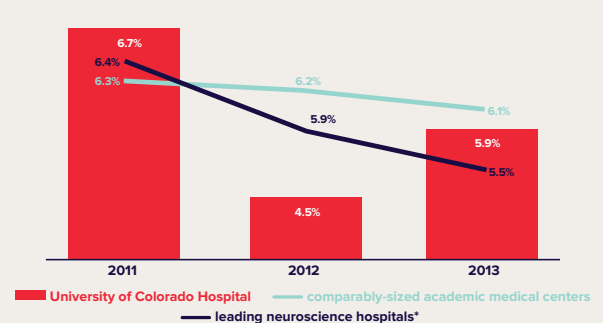
Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>. Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## BRAIN TUMOR MORTALITY INDEX



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>. Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## BRIAN TUMOR COMPLICATION RATES



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>. Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

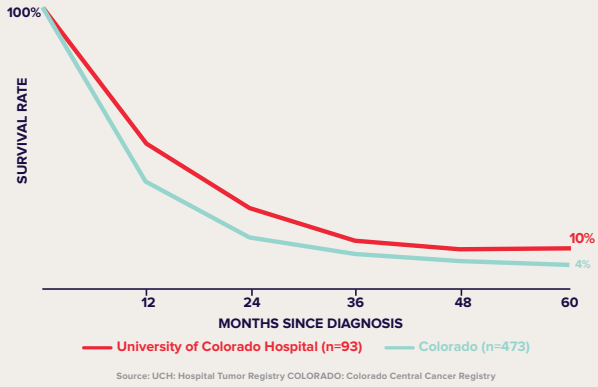
**3,224** OP VISITS     **94%** OF PITUITARY TUMOR PATIENTS HAVE A 5-YEAR SURVIVAL RATE

**47%** MALIGNANT BRAIN & CNS PATIENTS HAVE A 5-YEAR SURVIVAL RATE (25% NATL)

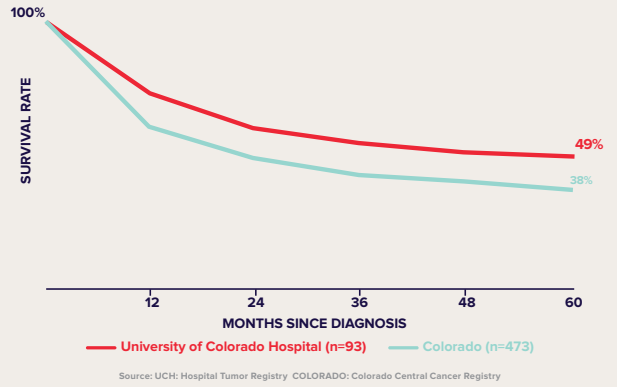
**PIONEERING RESEARCH** ON TUMOR VACCINE

**NEUSTRATEGY CENTER OF EXCELLENCE** CRANIAL TUMOR

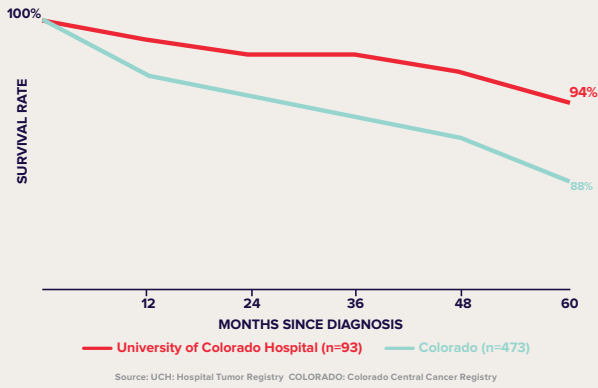
### BRAIN TUMOR (GBM ONLY) 5 YEAR SURVIVAL



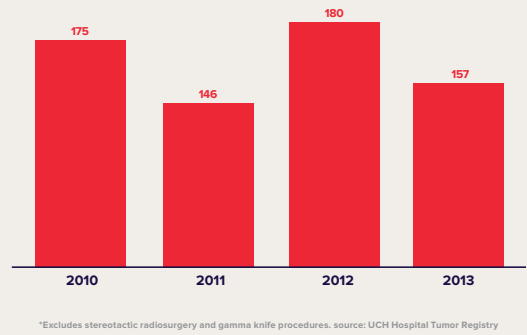
### BRAIN (INCLUDING BENIGN) 5 YEAR SURVIVAL



### PITUITARY GLAND 5 YEAR SURVIVAL



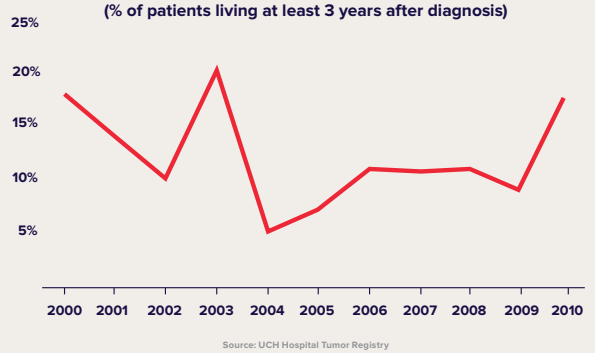
### BRAIN TUMOR PROCEDURES



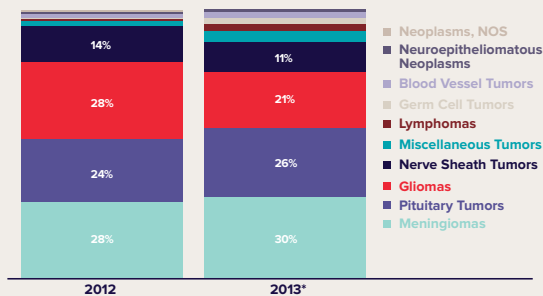
### MEDIAN SURVIVAL FOR GBM (MONTHS)



### LONG TERM SURVIVAL FOR GBM (% of patients living at least 3 years after diagnosis)



### BRAIN TUMOR DIAGNOSIS DISTRIBUTION

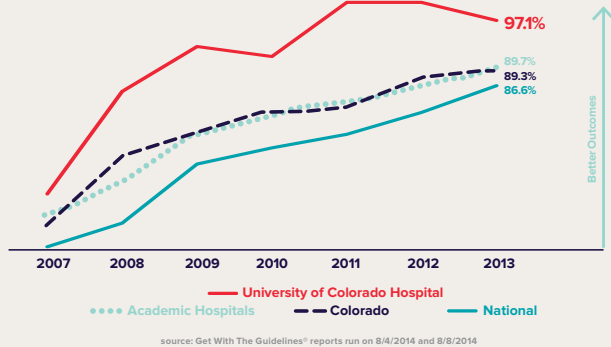


Meningiomas, pituitary tumors, gliomas and nerve sheath tumors comprise about 90% of neuro-oncology diagnoses seen at UCH in the past two years.  
 \*Annualized based on 6 months of data. Source: UCH Hospital Tumor Registry

# CEREBROVASCULAR & STROKE DATA



## IV RT-PA ARRIVE BY 2 HOURS, TREAT BY 3 HOURS

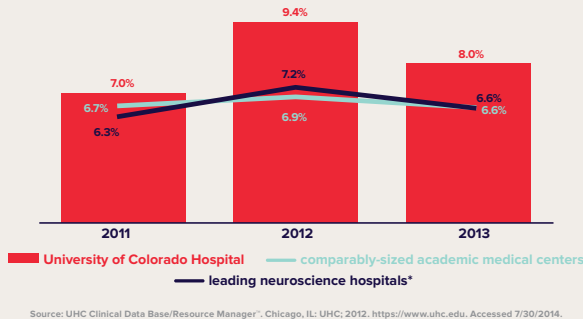


## NIHSS SCORE IMPROVEMENT (N=57)

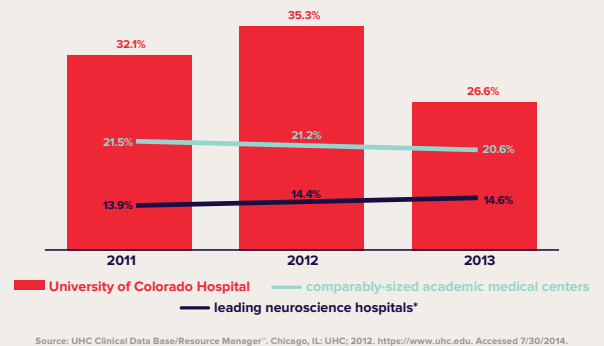


This Get With The Guidelines® Aggregate Data report was generated using the Quintiles PMT® system. Copy or distribution of the Get With The Guidelines® Aggregate Data is prohibited without the prior written consent of the American Heart Association and Quintiles.

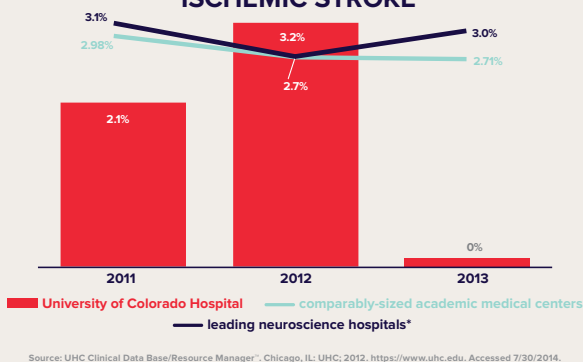
## COMPLICATION RATES - ISCHEMIC STROKE



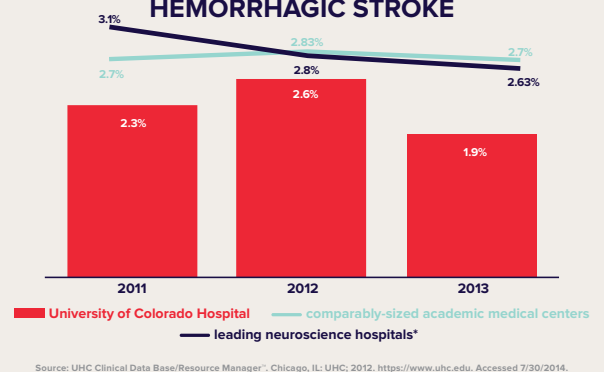
## COMPLICATION RATES - HEMORRHAGIC STROKE



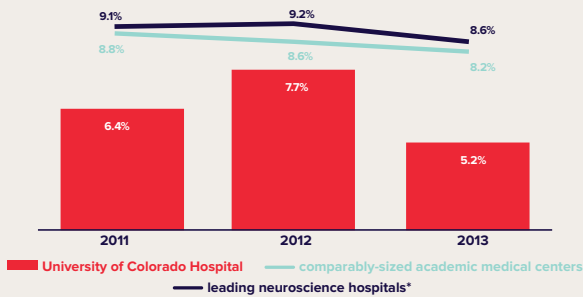
## 30 DAY READMISSION RATES - RELATED CAUSE - ISCHEMIC STROKE



## 30 DAY READMISSION RATES - RELATED CAUSE - HEMORRHAGIC STROKE

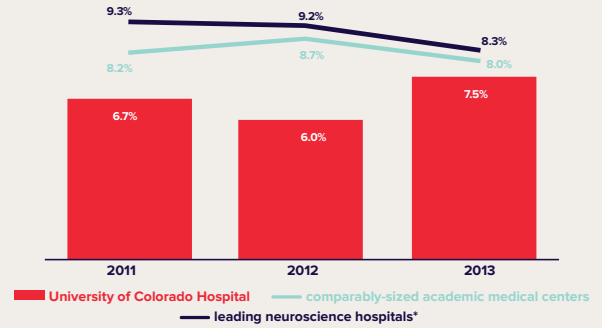


### 30 DAY READMISSION RATES - ALL CAUSE - ISCHEMIC STROKE



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

### 30 DAY READMISSION RATES - ALL CAUSE - HEMORRHAGIC STROKE



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

**97%** OF PATIENTS THAT ARRIVE BY 2 HOURS ARE TREATED WITHIN 3 HOURS OF SYMPTOM ONSET

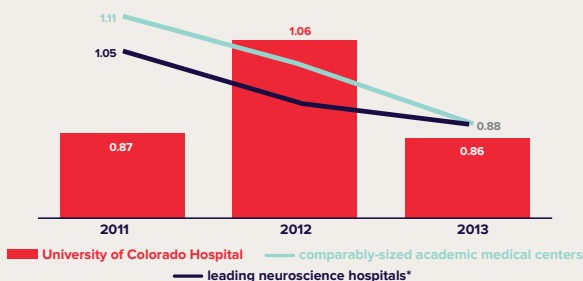
**1.9%** RELATED CAUSE READMISSION RATE FOR HEMORRHAGIC STROKE,  
**0%** FOR ISCHEMIC STROKE

**JC COMPREHENSIVE STROKE CENTER**

**NEUSTRATEGY CENTER OF EXCELLENCE** NEUROVASCULAR/STROKE

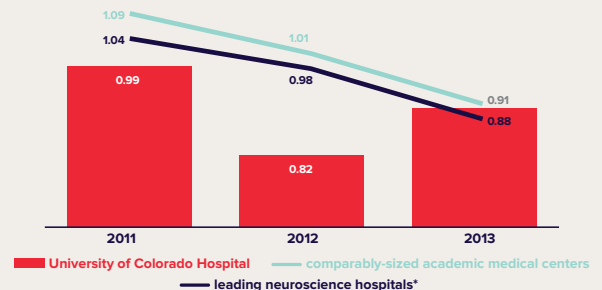
**AMERICAN HEART ASSOCIATION TARGET STROKE GOLD PLUS** 2011, 2012, 2013, 2014

### MORTALITY INDEX - ISCHEMIC STROKE



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

### MORTALITY INDEX - HEMORRHAGIC STROKE

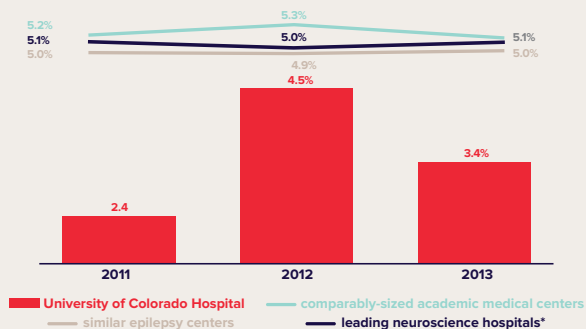


Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

# EPILEPSY DATA

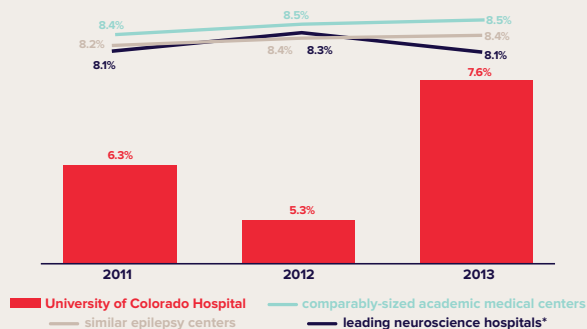


## 30 DAY READMISSION RATES - RELATED CAUSE



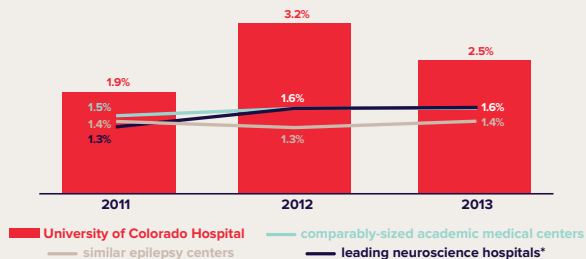
Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## 30 DAY READMISSION RATES - ALL CAUSE



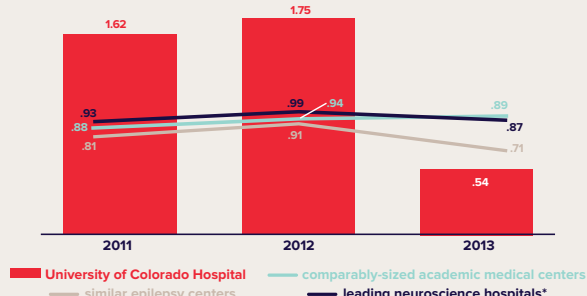
Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## EPILEPSY COMPLICATION RATES



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

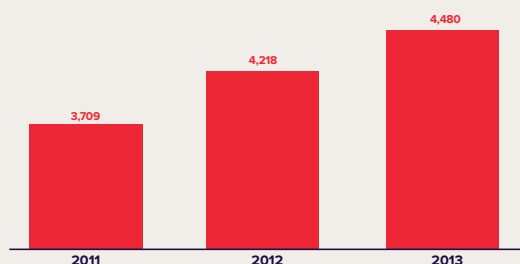
## EPILEPSY MORTALITY INDEX



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

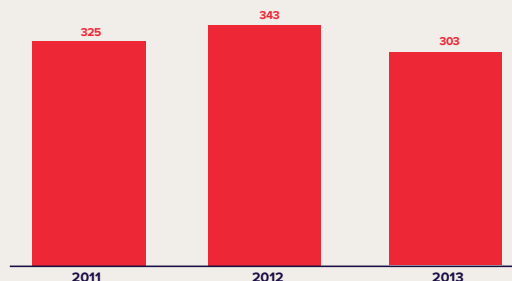
Mortality Index is the ratio of observed to expected mortality based on a risk adjustment algorithm. An index score of 1 indicates observed and expected mortality are equal. Values below 1 are desirable.

## EPILEPSY OUTPATIENT VISITS



source: UCH Finance

## EMU ADMISSIONS



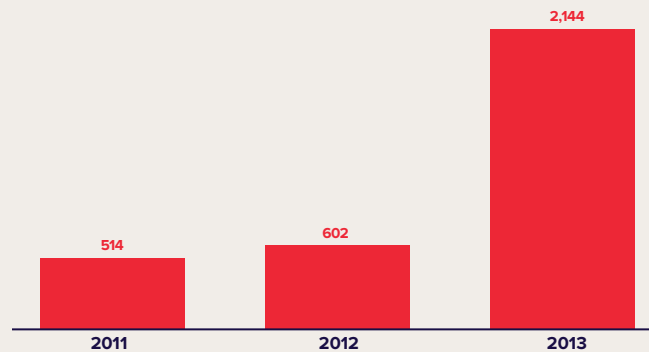
source: CU Department of Neurology



# COGNITIVE DISORDER DATA



## COGNITIVE DISORDER OUTPATIENT VISITS



source: Epic query

**LEVEL 4** EPILEPSY CENTER      **4,480** OUTPATIENT VISITS

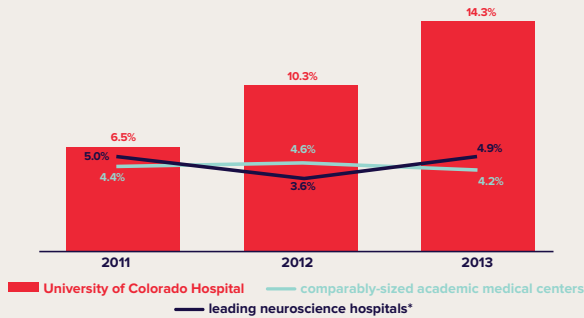
SURGICAL PATIENTS ACHIEVED A **98%** REDUCTION IN SEIZURES

**64%** OF PATIENTS WITH SURGICAL INTERVENTION ARE SEIZURE FREE

# MOVEMENT DISORDER DATA

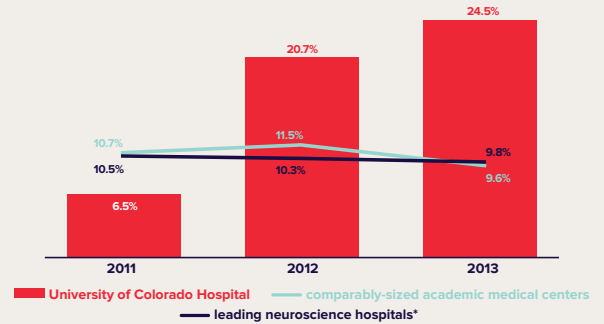


## 30 DAY READMISSION RATES - RELATED CAUSE



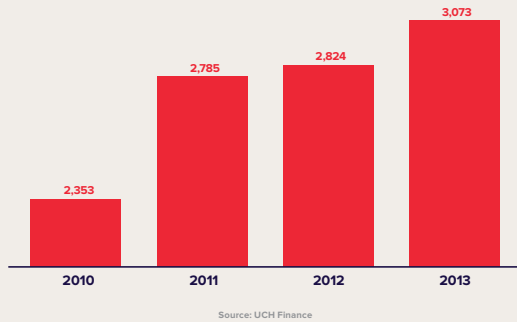
Source: UHC Clinical Data Base/Resource Manager\*, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## 30 DAY READMISSION RATES - ALL CAUSE



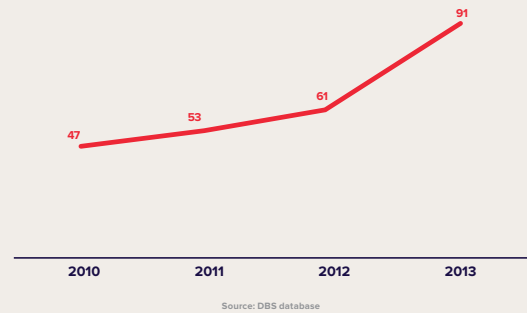
Source: UHC Clinical Data Base/Resource Manager\*, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## MOVEMENT DISORDER OUTPATIENT VISITS



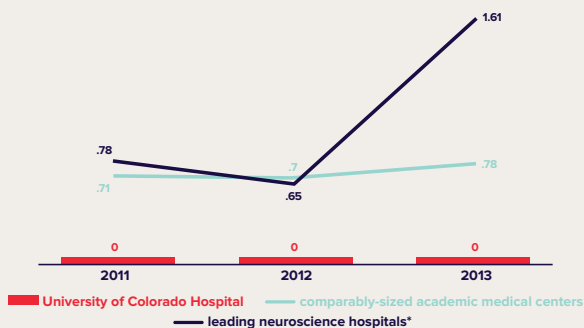
Source: UCH Finance

## DBS PROCEDURES (excluding Battery implants/explants)



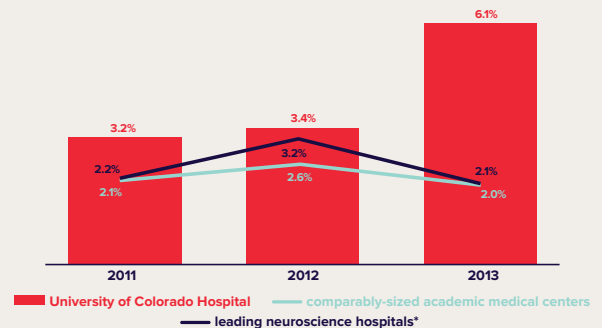
Source: DBS database

## MOVEMENT DISORDER MORTALITY INDEX



Source: UHC Clinical Data Base/Resource Manager\*, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

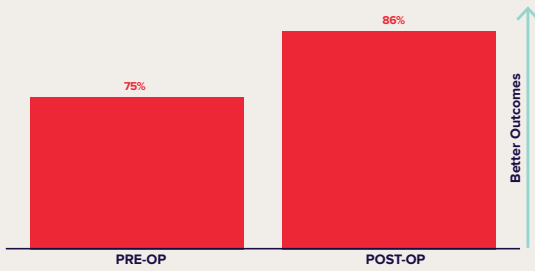
## MOVEMENT DISORDER COMPLICATION RATES



Source: UHC Clinical Data Base/Resource Manager\*, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## ACTIVITIES SPECIFIC BALANCE CONFIDENCE

High and Moderate Range (N=28)

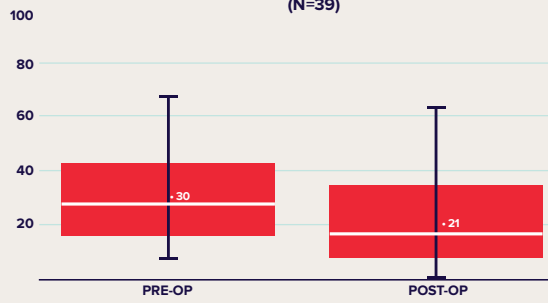


Source: DBS database

Balance confidence is an important indicator of functional mobility and independence in people with Parkinson's Disease. The Activities-specific Balance Confidence (ABC) Scale measures balance confidence in progressively more challenging yet common scenarios ranging from walking around inside the home to shopping at the mall to navigating an icy sidewalk. Prior to DBS implant, 75% (21 of 28) patients rated themselves as highly or moderately confident on the ABC scale. After DBS that number rose to 86% (24 of 28), indicating that 3 patients increased from very little confidence to either moderate or high confidence.

## PDQ-39 SUMMARY INDEX SCORE

(N=39)



Source: DBS database

### MOVEMENT DISORDERS

The average PDQ-39 Summary Index score decreased significantly by 9 points (p=0.008) after DBS implant mean post-operative duration of 10 months. 82% of patients showed improvement while 18% remained stable or had increasing symptoms after DBS. Lower scores reflect better health and fewer symptoms.

**MOST ACTIVE SURGICAL PROGRAM FOR DBS IN THE ROCKY MOUNTAIN REGION WITH 601 LEAD PLACEMENTS PERFORMED**

**OVER 3,000 PATIENT VISITS**

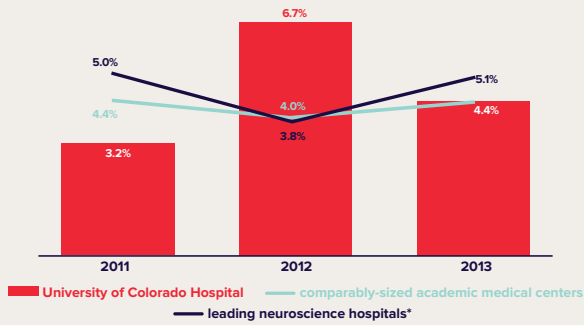
**NEUSTRATEGY CENTER OF EXCELLENCE NEUROSCIENCE**

**82% OF PATIENTS EXPERIENCE IMPROVEMENT IN PDQ-39 SCORES POST IMPLANTATION**

# MULTIPLE SCLEROSIS DATA

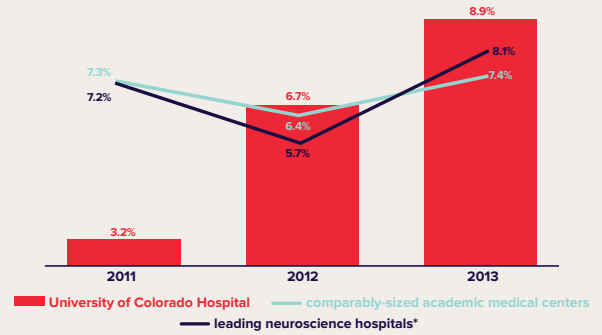


## 30 DAY READMISSION RATES - RELATED CAUSE



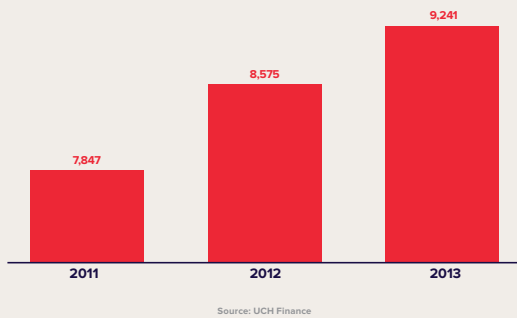
Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## 30 DAY READMISSION RATES - ALL CAUSE



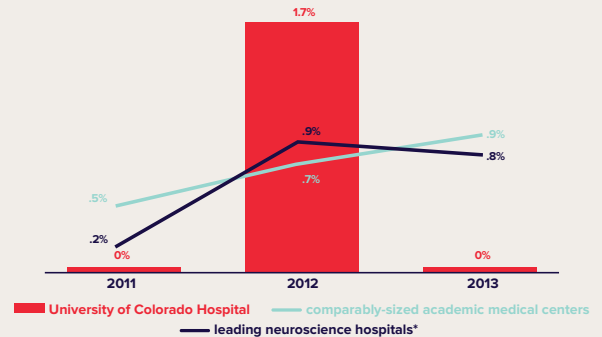
Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## MS OUTPATIENT VISITS



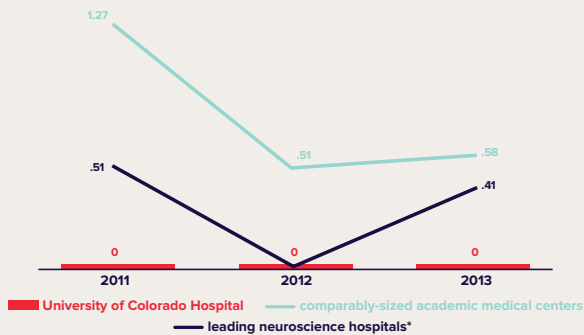
Source: UCH Finance

## MS COMPLICATION RATES



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

## MS MORTALITY INDEX



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

Mortality Index is the ratio of observed to expected mortality based on a risk adjustment algorithm. An index score of 1 indicates observed and expected mortality are equal. Values below 1 are desirable.

**9,241** OUTPATIENT VISITS

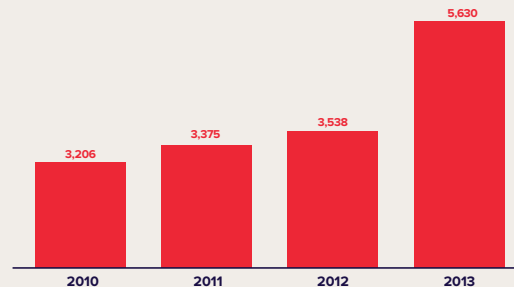
**40** ACTIVE CLINICAL AND LABORATORY TRIALS

**LARGEST** BRAIN TISSUE BANK IN THE COUNTRY

# NEUROCRITICAL CARE DATA

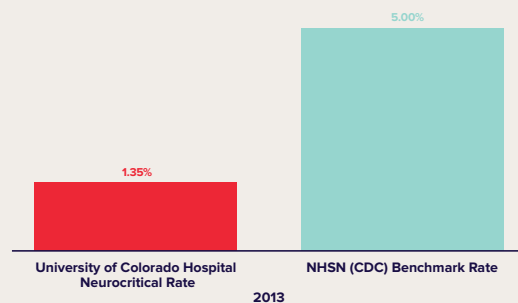


## NEUROCRITICAL CARE PATIENT DAYS



Source: UCH Finance

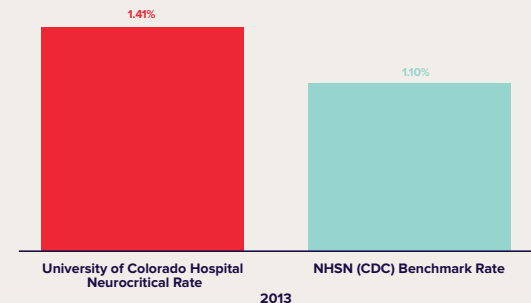
## CATHETER-ASSOCIATED URINARY TRACT INFECTIONS



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uchc.edu>. Accessed 7/30/2014.

Complications caused by catheter-associated urinary tract infection (CAUTI) cause discomfort to the patient, prolonged hospital stay, and increased cost and mortality. CAUTI rates are expressed as the number of infections per 1000 urinary catheter days. In 2013, the Neurocritical Intensive Care Unit at UCH was well below the benchmark provided by the National Healthcare Safety Network (NHSN).

## CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uchc.edu>. Accessed 7/30/2014.

Central line-associated bloodstream infections (CLABSI) typically cause prolonged hospital stay, increased cost and risk of mortality. CLABSI rates are expressed as the number of infections per 1000 central-line days. In 2013, the Neurocritical Intensive Care Unit at UCH hovered near the national benchmark provided by the National Healthcare Safety Network (NHSN).

CAUTI RATE OF **1.35/1,000 DAYS**, SIGNIFICANTLY LOWER THAN THE NATIONAL BENCHMARK

**BEACON AWARD, GOLD LEVEL**

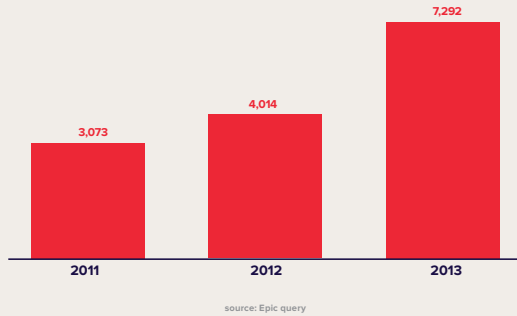
**1ST** NEUROCRITICAL CARE UNIT IN COLORADO **616** PATIENTS ADMITTED IN 2013

HIRED THE **FIRST** NEURINTENSIVIST IN THE ROCKY MOUNTAIN REGION

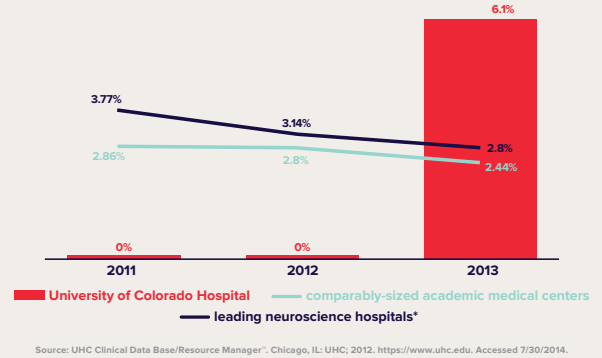
# NEUROMUSCULAR DATA



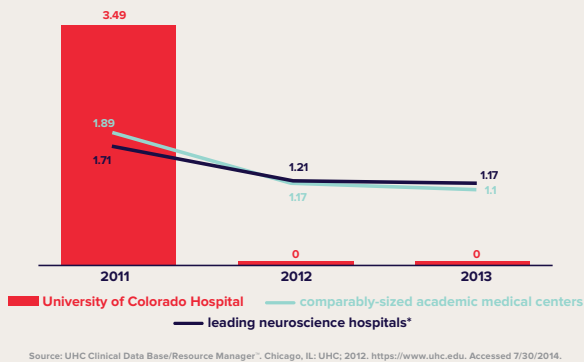
## NEUROMUSCULAR OUTPATIENT VISITS



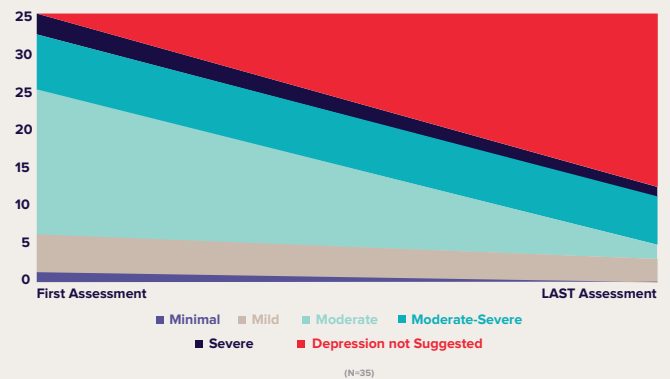
## NEUROMUSCULAR COMPLICATION RATES



## NEUROMUSCULAR MORTALITY INDEX

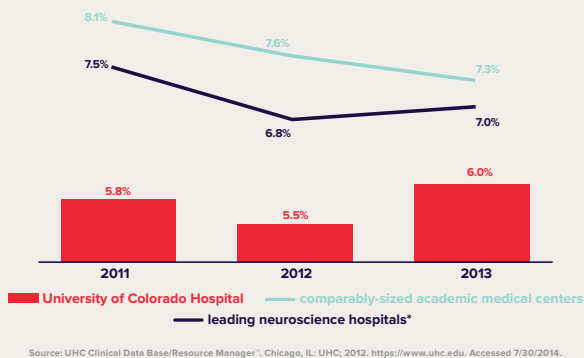


## IMPROVEMENT IN PHQ-9 SCORES (N=35)

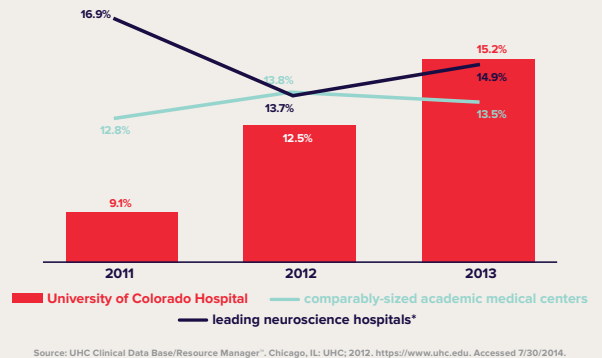


Patients whose PHQ-9 scores initially suggested possible depressive disorder showed significant improvement. Sixty-six percent of patients' (n=23) moved out of the "Depression Suggested" category. Six patients had continued symptoms but moved from higher to lower severity levels with an average score decrease of 5 points. Six patients remained stable or worsened with an average score increase of 2 points.

## 30 DAY READMISSION RATES - RELATED CAUSE



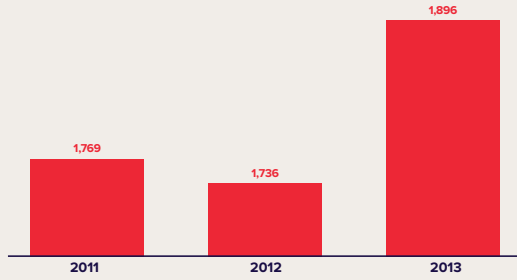
## 30 DAY READMISSION RATES - ALL CAUSE



# NEURO-OPHTHALMOLOGY DATA



## NEURO-OPHTHALMOLOGY OUTPATIENT VISITS



source: Epic query

**1,896** OUTPATIENT VISITS

**PIONEERING TESTS** OF VISION  
THROUGH 3D SIMULATION

**PIONEERING METHODOLOGY** FOR  
EARLY DETECTION OF ALZHEIMER'S

# SPINE DATA

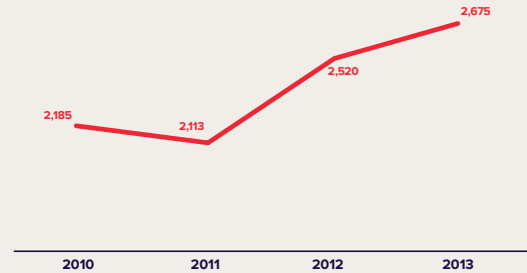


## SPINE OUTPATIENT VISITS



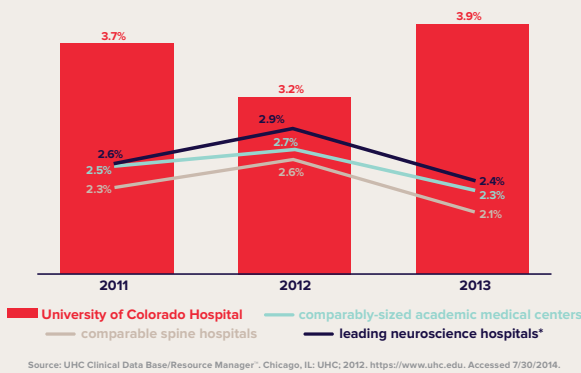
Source: UCH Finance

## SPINE OUTPATIENT PROCEDURES (EMG, Injection, Kyphoplasty, RFA)

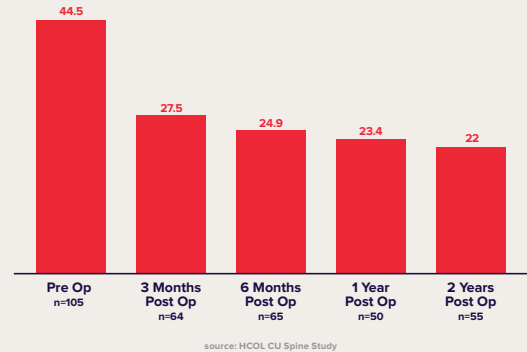


source: Spine Administration and IR database

## SPINE COMPLICATION RATES

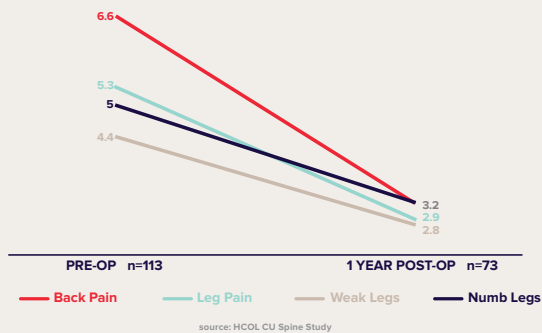


## PRE AND POST OPERATIVE ODI SCORE

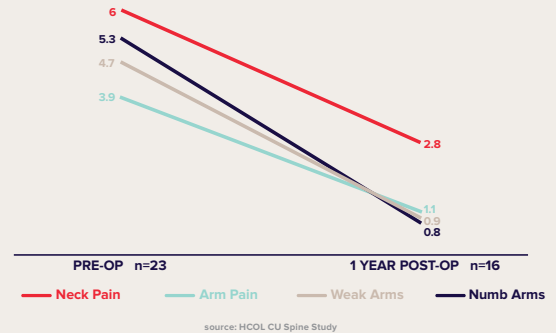


The Oswestry Disability Index (ODI) is the 'gold standard' of low back functional outcome measures. Patients who had surgery at UCH between October 2011 and December 2013 showed an average ODI score reduction of 20 points after surgery; well above the minimum clinically important difference of 15 points.

## PRE AND POST OPERATIVE SYMPTOM SEVERITY



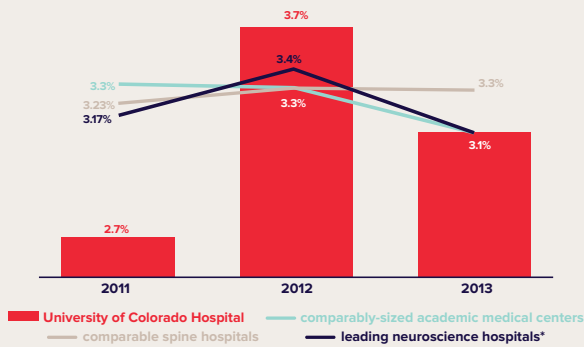
## PRE AND POST OPERATIVE SYMPTOM SEVERITY



Patients were asked to rate the severity of their pain, weakness, and numbness both pre-operatively and at one year post-operatively. Using a 0-10 visual analog scale where 0 means no symptom occurrence, post-operative scores improved dramatically.

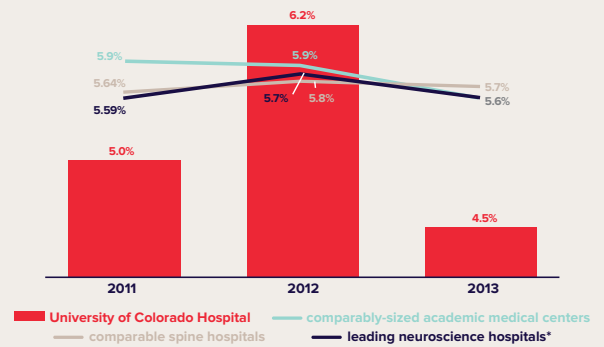


### 30 DAY READMISSION RATES - RELATED CAUSE



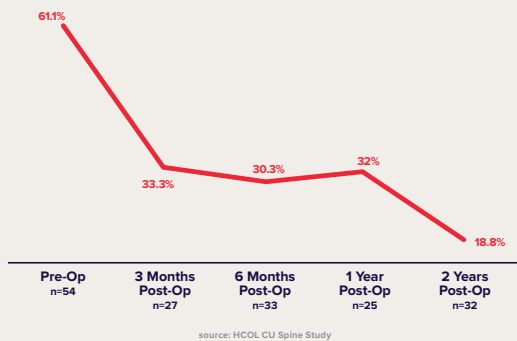
Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

### 30 DAY READMISSION RATES - ALL CAUSE



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

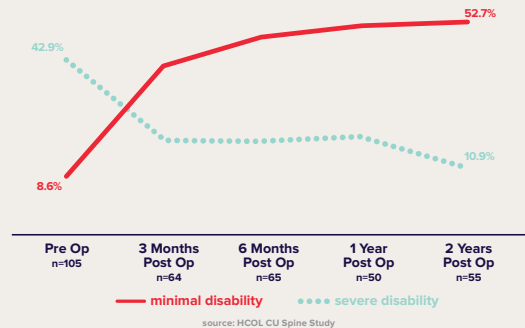
### PRE AND POST OPERATIVE WORK LIMITATIONS



source: HCOL CU Spine Study

Prior to surgery, 61% of surveyed patients who were employed had been placed on limited or light duties due to their spine conditions. Two years after surgery, 81% of respondents were free of work restrictions.

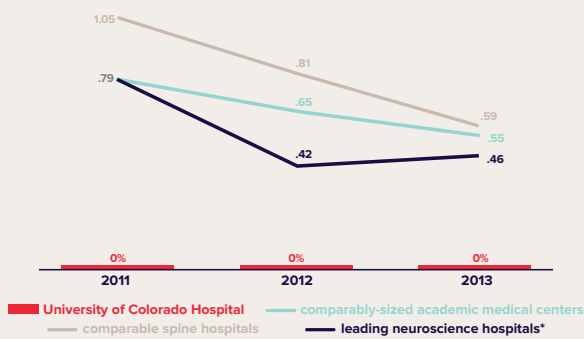
### PRE AND POST OPERATIVE LEVEL OF DISABILITY



source: HCOL CU Spine Study

Based on ODI interpretation ranges, the largest percentage of patients rated themselves as severely disabled prior to surgery. Post-operatively, the majority improved to minimally disabled, the best possible category on the ODI. (Not all interpretation ranges are shown on graph.)

### SPINE MORTALITY INDEX



Source: UHC Clinical Data Base/Resource Manager<sup>®</sup>, Chicago, IL; UHC; 2012. <https://www.uhc.edu>. Accessed 7/30/2014.

Mortality Index is the ratio of observed to expected mortality based on a risk adjustment algorithm. An index score of 1 indicates observed and expected mortality are equal. Values below 1 are desirable. Since the Spine service at UCH had no mortalities over the past three years, the mortality index is zero.

**15,069** OP VISITS    **0%** MORTALITY RATE

**TRUE INTEGRATION** OF NEUROSURGERY, ORTHOPEDIC SURGERY AND PM&R

**81%** POST SURGICAL PATIENTS REPORT BEING FREE OF WORK RESTRICTIONS

**NEUSTRATEGY CENTER OF EXCELLENCE** SPINE

