



**Getting Started  
with  
CareSelect™ Imaging with Cerner**

## Contents

Introduction .....	3
Appropriateness Criteria Scoring .....	4
Guidance at the Point-of-Order .....	5
Accessing Appropriateness Criteria in the Order-Driven Workflow.....	5
Selecting an Appropriate Alternate Order .....	8
Continuing with the Original Order .....	8
Common Indications Functionality .....	10
Millennium Applications CDS.....	12
Clinical Decision Support with PowerPlans .....	14
PowerPlans without high-scoring reason for exam order sentences.....	15
Searching Using a Diagnosis.....	16

## Introduction

In this guide, you will learn how to get started with CareSelect for point-of-order medical imaging guidance. CareSelect Clinical Decision Support has been implemented for the following modalities and physician groups:

### Modalities

- CT
- MRI
- NM
- PET

### Physician Groups

- [---]

---

### What is CareSelect?

CareSelect Imaging, provided by National Decision Support Company, is a national standard imaging decision support system based on the American College of Radiology (ACR) Appropriateness Criteria® (AC). The criteria consulted is for high-tech imaging modalities of CT, MRI, NM, or PET.

---

### Why CareSelect?

CareSelect with ACR AC® is the most comprehensive and widely recognized set of evidence-based imaging guidelines covering all modalities and clinical scenarios. More than 300 volunteer physicians representing more than 20 radiology and non-radiology specialty organizations participate on the ACR AC expert panels. These nationally transparent guidelines are being continuously updated by these experts and provide real-time access to the latest medical imaging decision support.

CareSelect is integrated with your Cerner computerized provider order entry (CPOE) workflow and guides ordering professionals to the most appropriate medical imaging exam. This ensures that the right patient gets the right scan for the right indication.

---

Need help? For questions, comments, and support, please contact:

## Appropriateness Criteria Scoring

CareSelect Imaging uses the following criteria to determine appropriateness scores as given in the Appropriateness Criteria:

- Patient age
- Patient gender
- Exam ordered
- Structured indication(s) selected

<b>Numeric Scores (Rating)</b>	<b>Category Name</b>	<b>Category Definition</b>	<b>Disagreement</b>
No Score (Gray)	Indeterminate	No score available-outside scoring scope. The combination of exam, indication, patient age, and patient sex is not covered within Appropriateness Criteria.	The dispersion of the individual ratings from the panel median rating is assessed to determine if there is no disagreement.  When the individual ratings are too dispersed from the panel median (disagreements), "May be appropriate" is the designated rating category.
1, 2, or 3 (Red)	Usually not appropriate	The imaging procedure or treatment is unlikely to be indicated in the specified clinical scenario, or the risk-benefit ratio for patients is likely to be unfavorable.	
4, 5, or 6 (Yellow)	May be Appropriate	The imaging procedure or treatment may be indicated in the specific clinical scenario as an alternative to imaging procedures or treatment with a more favorable risk-benefit ratio. Or the risk-benefit ratio for patients is equivocal.	
7, 8, or 9 (Green)	Usually appropriate	The imaging procedure or treatment is indicated in the specified clinical scenario at a favorable risk-benefit ratio for patients	

- The **indeterminate** category is **gray**. No score available - outside of scoring scope. The combination of exam, indication, patient age, and patient sex is not covered within the Appropriateness Criteria.
- The **usually not appropriate** category is represented by **red**. This category indicates that the harm of doing the procedure generally outweighs the benefits.

- The **may be appropriate** category is represented by **yellow**. This middle category is used when the risks and benefits are equal or unclear.
- The **usually appropriate** category is represented **green**. This category indicates that the benefits of doing the procedure usually outweigh the harms or risks.

## Guidance at the Point-of-Order

National Decision Support Company and Cerner have collaborated to ensure an optimal experience for those entering radiology orders. The entire workflow takes place directly in Cerner with minimal changes to your existing order entry workflow. Feedback is immediate, so there is no disruption to the doctor-patient relationship.

## Accessing Appropriateness Criteria in the Order-Driven Workflow

The ordering professional selects the radiology order; in this case, the order is CT Head or Brain w/ + w/o Contrast. The CDS window will present to the user upon selection of in-scope exam.

The screenshot shows a decision support window titled "Decision Support for CT HEAD OR BRAIN W + WO CONTRAST". At the top, it displays patient information: "ASTER, BEVERLY MARION", "Female", "20 JAN 1946", "73 Years", and "MED: 466". Below the title, there is a search box labeled "Please select a reason for exam" with a magnifying glass icon. To the right of the search box are two buttons: a blue button labeled "I can't find a match" and a red button labeled "Cancel CT HEAD OR BRAIN W + WO CONTRAST". Below the search box is a section titled "Common Indications (8)" containing a list of checkboxes and their corresponding text:

- Altered mental status
- Brain mass or lesion, follow-up
- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic
- Neuro deficit, acute, stroke suspected
- Subdural hematoma
- Syncope, recurrent

In the bottom right corner, there is a small logo for "NATIONAL DECISION SUPPORT COMPANY".

If the ordering professional does not see an appropriate indication in the common indications list, the ordering professional can enter a **reason for exam or search term** in the “Please select a reason for exam” box. This box is used to search the ACR’s list of structured indications. The list of returned structured reasons for exam displays under “other indications.”

### Decision Support for CT HEAD OR BRAIN W + WO CONTRAST

Please select a reason for exam

I can't find a match

Cancel CT HEAD OR BRAIN W + WO CONTRAST

Common Indications (3)

- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic

Other Indications (10)

Sort by Rank   Sort A -> Z

- Headache, neuro deficit
- Headache, sinus or mastoid
- Headache, temporal arteritis suspected
- Headache, chronic, no new features
- Headache, cluster/trigeminal
- Headache, cancer or immunocompromise
- Headache, abnormal ICP suspected
- Headache, chronic, with new features
- Headache, with cough or exertion
- Headache, acute, normal neuro exam

NATIONAL  
DECISION SUPPORT  
COMPANY

Once the ordering professional selects the structured reason for exam on the left, CareSelect provides feedback in the decision support window on the right (seen in the screenshot below).

Decision support displays the appropriateness score of the order being placed (original order selected is listed on the right and highlighted in yellow) as well as suggested alternatives based on the criteria selected.

### Decision Support for CT HEAD OR BRAIN W + WO CONTRAST

Please select a reason for exam

Headache, chronic, no new features

Common Indications (3)

- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic

Other Indications (10)

Sort by Rank   Sort A -> Z

- Headache, neuro deficit
- Headache, sinus or mastoid
- Headache, temporal arteritis suspected
- Headache, chronic, no new features
- Headache, cluster/trigeminal
- Headache, cancer or immunocompromise
- Headache, abnormal ICP suspected
- Headache, chronic, with new features
- Headache, with cough or exertion
- Headache, acute, normal neuro exam

Appropriateness rankings for a 73 year old Female

Display Evidence...

<b>CT Head or Brain w + wo Contrast</b>	3	Confirm	Cancel Order
Cost: \$\$\$	RRL:		
<b>MRI Brain Open Intracranial Proc w Con</b>	4	Replace	
Cost: \$\$\$	RRL:		
<b>MRI Brain Open Intracranial Proc wo Con</b>	4	Replace	
Cost: \$\$	RRL:		
<b>MRI Brain w + wo Contrast</b>	4	Replace	
Cost: \$\$\$	RRL:		
<b>MRI Brain wo Contrast</b>	4	Replace	
Cost: \$\$\$	RRL:		
<b>CT Head or Brain w Contrast</b>	3	Replace	
Cost: \$\$	RRL:		
<b>CT Head or Brain wo Contrast</b>	3	Replace	
Cost: \$\$	RRL:		
<b>CT Angiography Head w + wo Contrast</b>	2	Replace	
Cost: \$\$\$	RRL:		

The ordering professional is presented with the score of the original exam and scores for alternate exams. After the ordering professional reviews the presented choices, he or she can continue with the original order or replace the original with a suggested alternative.

Each scenario includes a link to supporting evidence which the ordering professional can select to view. The ordering professional can follow the “**Display Evidence**” link to read detailed rationale from the American College of Radiology for the appropriateness scores provided.

**Decision Support for CT HEAD OR BRAIN W + WO CONTRAST**

Please select a reason for exam

headache   Headache, chronic, no new features ✕

Common Indications (3)

- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic

Other Indications (10)

Sort by Rank  Sort A -> Z

- Headache, neuro deficit

Appropriateness rankings for a 73 year old Female

[Display Evidence...](#)

**CT Head or Brain w + wo Contrast**

3

Cost: \$\$ RRL: ★★☆☆

**MRI Brain Open Intracranial Proc w Con**

4

Cost: \$\$ RRL: ★★★★★

**MRI Brain Open Intracranial Proc wo Con**

4

Cost: \$\$ RRL: ★★★★★

**American College of Radiology  
ACR Appropriateness Criteria®**

**Clinical Condition:** Headache

**Variant 1:** Chronic headache. No new features. Normal neurologic examination.

Radiologic Procedure	Rating	Comments	RRL*
MRI head without and with IV contrast	4		○
MRI head without IV contrast	4		○
CT head without IV contrast	3		☆☆☆
CT head without and with IV contrast	3		☆☆☆
CT head with IV contrast	3		☆☆☆
MRA head without and with IV contrast	2		○
MRA head without IV contrast	2		○
Arteriography cervicocerebral	2		☆☆☆
CTA head with IV contrast	2		☆☆☆
<b>Rating Scale:</b> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Based on the ordering professional’s entry of **headache**, CareSelect filters the clinical scenarios that match with the **CT Head or Brain w/ + w/o Contrast** exam. The ordering professional simply selects the best clinical scenario that matches the patient’s situation. If the ordering professional has a question on

the content, he or she can select the *Display Evidence* link and review the ACR appropriateness criteria PDF document.

---

## Selecting an Appropriate Alternate Order

Based on the appropriateness criteria feedback, the ordering professional may decide to change the order and replace with an alternate order by selecting from the list provided on the right.

**Decision Support for CT HEAD OR BRAIN W + WO CONTRAST**

Please select a reason for exam

headache   Headache, chronic, no new features ✕

Common Indications (3)

- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic

Other Indications (10)

Sort by Rank  Sort A -> Z

- Headache, neuro deficit

Appropriateness rankings for a 73 year old Female [Display Evidence...](#)

<b>CT Head or Brain w + wo Contrast</b>	3	<input type="button" value="Confirm"/> <input type="button" value="Cancel Order"/>
Cost: \$\$	RRL: ▲▲▲▲	
<b>MRI Brain Open Intracranial Proc w Con</b>	4	<input type="button" value="Replace"/>
Cost: \$\$\$	RRL:	
<b>MRI Brain Open Intracranial Proc wo Con</b>	4	<input type="button" value="Replace"/>
Cost: \$\$	RRL:	

---

The ordering professional selects a more appropriate alternate order highlighted in green.

---

The ordering professional is then taken to the order entry format to complete any additional order details before submitting the order.

## Continuing with the Original Order

If the ordering professional determines that the original order is still the most appropriate, the ordering professional clicks **“Confirm”** at the top right of the Decision Support window.

## Decision Support for CT HEAD OR BRAIN W + WO CONTRAST

Please select a reason for exam

headache

Common Indications (3)

- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic

Other Indications (10)

Sort by Rank  Sort A -> Z

- Headache, neuro deficit

Appropriateness rankings for a 73 year old Female [Display Evidence...](#)

<b>CT Head or Brain w + wo Contrast</b>	<b>3</b>	<input type="button" value="Confirm"/>	<input type="button" value="Cancel Order"/>
Cost: \$\$	RRL: ▲▲▲▲		
<b>MRI Brain Open Intracranial Proc w Con</b>	<b>4</b>	<input type="button" value="Replace"/>	
Cost: \$\$\$	RRL:		
<b>MRI Brain Open Intracranial Proc wo Con</b>	<b>4</b>	<input type="button" value="Replace"/>	
Cost: \$\$	RRL:		

---

The ordering professional clicks **Confirm** to order the original procedure.

---

If the score of the order is 3 or below the ordering professional will be prompted with acknowledgement reasons to specify why those chose a lower scoring exam.

- Scores 1,2,3 require the information before the ordering professional can proceed to complete the order.

Please confirm the exam below changing the exam from:   
**CT Head or Brain w + wo Contrast (score: 3)**

Please choose an acknowledgement reason before proceeding:

**Comment:\***

---

The ordering professional enters why the procedure is appropriate by selecting an option from the predetermined list or selects "Other" and enters a free text reason in the box.

---

Once the ordering professional has gone through decision support, the ordering professional is taken into the order scratchpad to complete any remaining order-specific questions.

The screenshot shows a web-based order scratchpad for a CT Head or Brain w/ + w/o Contrast exam. The form is titled "Details for CT Head or Brain w/ + w/o Contrast" and includes various fields for patient information, exam details, and scheduling. Key fields include:

- Requested Start Date/Time:** 03/15/2019 10:00 AM CDT
- Priority:** Routine
- Reason for exam:** Headache, chronic, no new features
- Special instructions:** (Empty text box)
- Consulting physician:** (Empty text box)
- Transport mode:** (Empty dropdown)
- Patient has to:** Yes (selected), No
- Patient on O2:** Yes (selected), No
- ABN Reason:** (Empty dropdown)
- CardSelect ID#:** 00799910
- CardSelect Acknowledgement Reason Comment:** Talked to Dr. Brown in radiology a...
- CardSelect Score:** 3

At the bottom of the form, there are buttons for "Showing Required Details", "Do Table", "Orders For Configuration", "Orders For Nurse Review", and a "Sign" button.

The ordering professional then signs and completes the order.

## Common Indications Functionality

This functionality allows organizations to show the most common indications for an exam. The goal is to limit the indication list to be a useful pick list under 15-20 indications. The NDSC content team has created a content set that contains the most common indications for an exam.

Common indication lists are created according to market utilization and clinician review. A thorough review of each exam was done by practicing physicians to determine the most impactful clinical scenarios to create streamlined indication lists that should encompass highest use case clinical reasons for the given exam. NDSC evaluated common clinical reasons for the exams and common customer choices seen across the NDSC customer base.

Example of common indications for a CT Head or Brain WO Contrast:

## Decision Support for CT HEAD OR BRAIN WO CONTRAST

Please select a reason for exam



I can't find a match

Cancel CT HEAD OR BRAIN WO CONTRAST

Common Indications (10)

- Altered mental status
- Brain mass or lesion, follow-up
- Head trauma, vascular injury suspected
- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic
- Neuro deficit, acute, stroke suspected
- Polytrauma, critical, head/C-spine injury suspected
- Subdural hematoma
- Syncope, recurrent

NATIONAL  
DECISION SUPPORT  
COMPANY

If an ordering professional does not see the desired reason for exam, he or she can begin typing in the "Please select a reason for exam" search box and other indications will appear.

## Decision Support for CT HEAD OR BRAIN WO CONTRAST

Please select a reason for exam



I can't find a match

Cancel CT HEAD OR BRAIN WO CONTRAST

Common Indications (3)

- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic

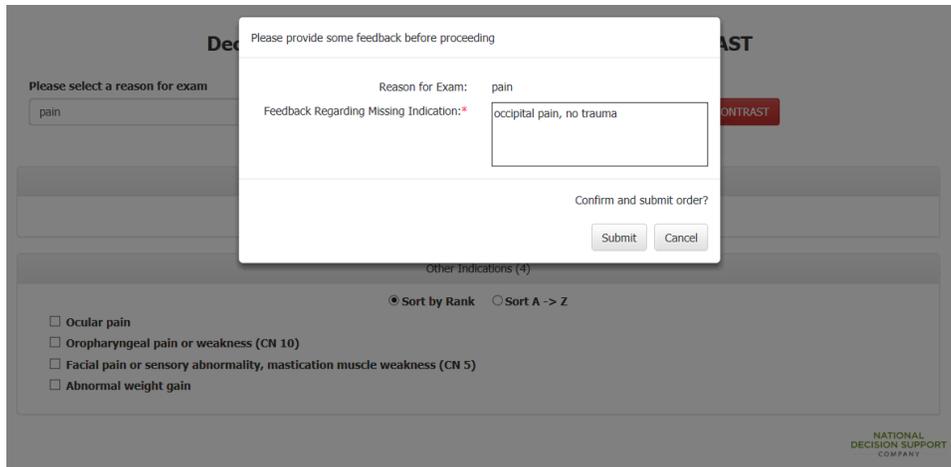
Other Indications (10)

Sort by Rank  Sort A -> Z

- Headache, neuro deficit
- Headache, sinus or mastoid
- Headache, temporal arteritis suspected
- Headache, cancer or immunocompromise
- Headache, chronic, no new features
- Headache, cluster/trigeminal
- Headache, with cough or exertion
- Headache, abnormal ICP suspected
- Headache, chronic, with new features
- Headache, acute, normal neuro exam

NATIONAL  
DECISION SUPPORT  
COMPANY

If a desired reason for exam is still not located, select "I can't find a match."



Ordering professionals will be prompted to enter feedback on the missing indication. This feedback is regularly evaluated for future updates to CareSelect.

Ordering professionals then manually enter their desired reason for exam in the free text reason for exam on the order details scratchpad. “No Score” will display in the score field because exact AUC could not be consulted do to inability to locate the desired indication in CareSelect.

## Millennium Applications CDS

Review for accuracy as pertinent to your Cerner Millennium domain information may be viewable in.

After signing the order, the order displays in “diagnostic tests” in the details tab with order information.

ASTER, BEVERLY MARION

ASTER, BEVERLY MARION  
 Allergies: Allergies Not Recorded  
 Care Team: Simmons, Justine (913) 555-1133

DOB: 1/20/1946  
 Dose Weight:  
 Loc: ICU; ICU13; 01

Age: 72 years  
 Isolation:  
 CommonWell: Not Enabled

Sex: Female  
 Resuscitation Status:  
 HealthLife: Yes

FN: 000102211  
 Clinical Trial:  
 Advance Dir:

Orders

Reconciliation Status  
 Meds History  
 Admission  
 Discharge

Orders Medication List

Displayed: All Active Orders | All Inactive Orders | All Orders 5 Days Back

Order Name	Status	Dose ...	Details
CT Head or Brain w/o...	Ordered (...)	12/10/18 12:27:00 CST, Routine, Reason: Headache, acute, severe, worst HA of life, No, Neuro	

Details

Di Table Orders For Cosignature Orders For Nurse Review Orders For Signature

ASTER, BEVERLY MARION - Order Information for: CT Head or Brain w/o Contrast

Task View Help

Original order entered and electronically signed by Johnson, Phil on 12/10/2018 at 12:51 PM CST.  
 Radiology Department

**CT Head or Brain w/o Contrast**

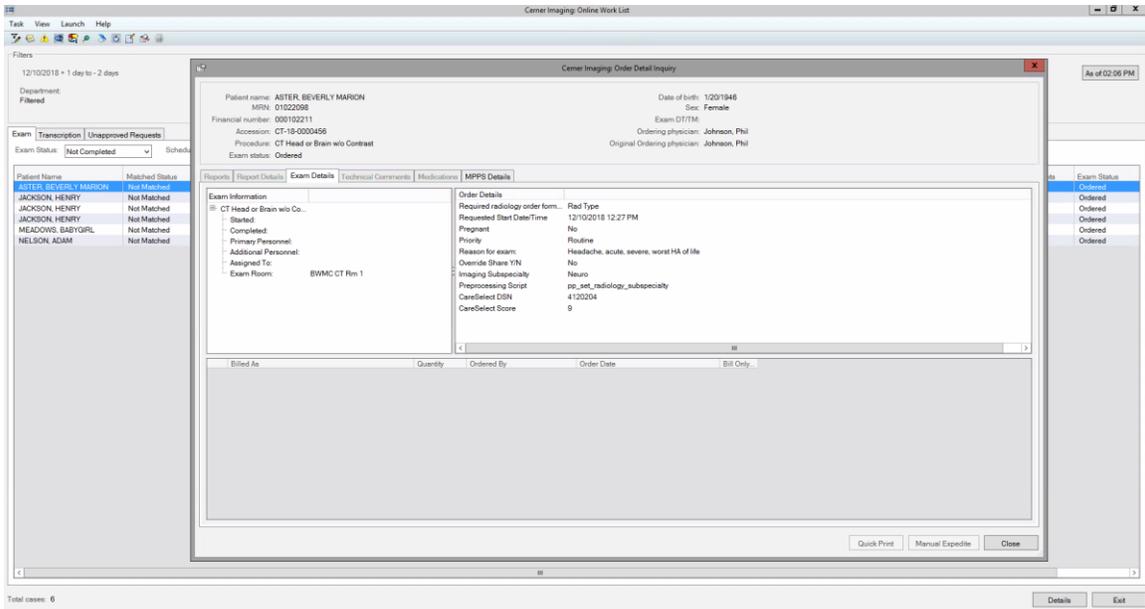
Details Additional Info History Comments Validation Results Ingredients Pharmacy

Details

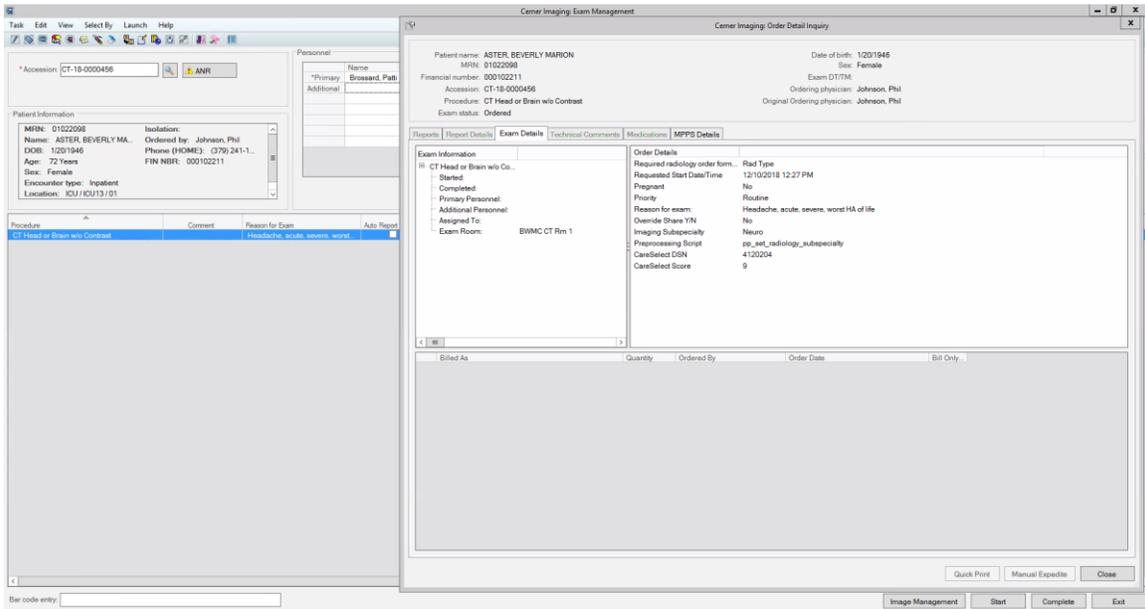
Requested Start Date/Time	12/10/2018 12:27 PM CST
Priority	Routine
Reason for exam:	Headache, acute, severe, worst HA of life
Pregnant	No
Required radiology order format field	Rad Type
Override Share Y/N	No
Imaging Subspecialty	Neuro
CareSelect DSN	4120204
CareSelect Score	9
Preprocessing Script	pp_set_radiology_subspecialty

USTEST MD061365 | December 10, 2018 12:55 PM CST

On the Cerner Imaging Worklist, in the order detail inquiry window, the following order information is displayed:



In Cerner Exam Management, in the order detail inquiry window, the following order information is displayed:



## Clinical Decision Support with PowerPlans

PowerPlans with high-scoring reason for exam order sentences

If a PowerPlan has an order sentence that contains a high-scoring indication (based on ACR Appropriateness Criteria) as the saved reason for exam, CDS will not present to ordering professionals and a score and DSN will be automatically assigned in the background.

The screenshot shows a 'Medication List' window with a table of orders. The 'CT Head or Brain w/o Contrast' order is selected. A red box highlights the 'Reason: SAH suspected, initial exam' field. Below the table, the 'Details' section for this order is visible, showing 'Requested Start Date/Time', 'Priority: Stat', and 'Reason for exam: SAH suspected, initial exam'.

## PowerPlans without high-scoring reason for exam order sentences

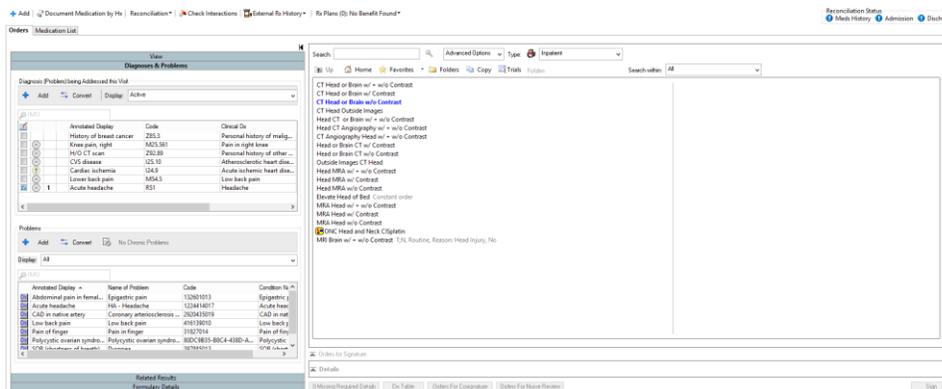
When ordering a PowerPlan that has not been updated with a high scoring reason for exam order sentence, order the PowerPlan and initiate as normal. When the PowerPlan is initiated, CDS will prompt for all in-scope exams. Complete CDS in the same manner as CDS for an individual exam. The example below would display CDS to evaluate the appropriateness of “trauma” for a CT Head or Brain w/o Contrast given the patient’s age and gender.

The screenshot shows a 'Medication List' window with a table of orders. The 'CT Head or Brain w/o Contrast' order is selected. A red box highlights the 'Reason: Trauma, Transport Mode: Stretcher, 0' field. Below the table, the 'Details' section for this order is visible, showing 'Requested Start Date/Time', 'Priority: Stat', and 'Reason for exam: Trauma, Transport Mode: Stretcher, 0'.

Ordering professional completes any remaining order fields and signs the order.

## Searching Using a Diagnosis

The ordering professional can opt to select a diagnosis prior to entering the order. In the example below, “acute headache” is selected as the patient’s diagnosis.



After selecting a diagnosis, the ordering professional enters an order, in this example CT Head or Brain WO Contrast.

The CDS window will search using synonym terms for the selected diagnosis, filtering down indications based on the previously selected diagnosis of acute headache.

### Decision Support for CT HEAD OR BRAIN WO CONTRAST

Please select a reason for exam

Filtering by Your Order Diagnosis:

- Headache (R51)

Common Indications (4)

- Headache, infection suspected
- Headache, intracranial hemorrhage suspected
- Headache, post traumatic
- Polytrauma, critical, head/C-spine injury suspected

Other Indications (22)

Sort by Rank  Sort A -> Z

- Headache, acute, normal neuro exam
- Meningitis/CNS infection suspected
- Carotid or vertebral dissection suspected
- Headache, neuro deficit
- Headache, abnormal ICP suspected
- Headache, with cough or exertion
- Headache, temporal arteritis suspected
- Headache, cluster/trigeminal
- ICP elevation suspected
- Sinusitis, orbital or intracranial complications
- Headache, chronic, no new features
- Headache, chronic, with new features

The user can also unselect the “Filtered by Order Diagnosis” box to search for additional indications.