

Evaluation Questions – CDS Structure

| Variable of interest | Operationalized variable | Data source: YNHH | Available pre-intervention? |
|---|---|--|-----------------------------|
| The asthma forms help me take better care of patients | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| The asthma forms are not worth the time they take | Pct respondents replying <i>disagree</i> or strongly <i>disagree</i> (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| The asthma forms remind me about something I might have forgotten to do | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| The asthma forms teach me about appropriate care for asthma | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| The asthma forms are difficult to use | Pct respondents replying <i>disagree</i> or strongly <i>disagree</i> (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| The asthma forms fit efficiently into my workflow | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| The asthma forms were easy to learn to use | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| Efficiency of forms: first visit for asthma | Time-motion study, direct observation of clinic visits: total time in data entry; and/or total clicks; and/or total visit length – how many visits to assess? | Direct observation | N |
| Efficiency of forms: repeat visit for asthma | Time-motion study, direct observation of clinic visits: total time in data entry; total clicks; total visit length – how many visits to assess? | Direct observation | N |

Evaluation Questions – CDS Process

| Variable of interest | Operationalized variable | Data source: YNHH | Available pre-intervention? |
|--|---|-------------------|-----------------------------|
| Use of asthma forms | Pct of visits with any use of asthma form if pt with asthma in billing diagnosis code (or problem list) | Centricity | |
| Asthma control measured in a formalized manner (impairment & risk) | Any impairment plus any risk documented in asthma form for each visit with asthma in billing diagnosis code (or problem list) | Centricity | |
| Cough frequency measured | completion of this part of the asthma form for each visit with asthma in billing diagnosis code (or problem list) | Centricity | |
| Wheezing frequency measured | completion of this part of the asthma form for each visit with asthma in billing diagnosis code (or problem list) | Centricity | |
| Chest tightness frequency measured | completion of this part of the asthma form for each visit with asthma in billing diagnosis code (or problem list) | Centricity | |
| Nighttime awakenings measured | completion of this part of the asthma form for each visit with asthma in billing diagnosis code (or problem list) | Centricity | |
| use measured | completion of this part of the asthma form for each visit with asthma in billing diagnosis code (or problem list) | Centricity | |
| Interference with normal activities measured | completion of this part of the asthma form for each visit with asthma in billing diagnosis code (or problem list) | Centricity | |
| Use of the terms "impairment" and "risk" | Use of these terms in A/P for each visit with asthma in billing diagnosis code (or problem list)?? | Centricity | |
| Therapeutic step agrees with CDS recommendation | Percent of visits with selected step same as CDS recommendation (won't be able to tell if changed to agree b/c of recommendation, though) | Centricity | |
| Therapy congruent with severity/impairment/risk assessment | Percent of visits with high dose inhaled steroids ordered (or already on med list) for pts with CDS step 5-6 + pct of visits with medium dose for step 3-4 + pct of visits with low-dose for step 2 | Centricity | |

Evaluation Questions – Practitioner Knowledge, Skills and Attitudes

| Variable of interest | Operationalized variable | Data source: YNHH | Available pre-intervention? |
|---|--|--|-----------------------------|
| I am familiar with the recommendations for management of chronic asthma in the 2007 guidelines from the NIH/NHLBI | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| I know what a clinical decision support system is | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| I know when to refer children with asthma for additional services | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| I have used the asthma management forms of the Centricity (Logician) system | Pct respondents replying usually or always (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| I complete the asthma assessment forms during the patient visit | Pct respondents replying usually or always (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| I print an asthma plan and give it to the patient, if the patient has asthma on the problem list | Pct respondents replying usually or always (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| I print an asthma plan and give it to the patient, if the patient is having asthma symptoms | Pct respondents replying usually or always (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| I agree with the recommendations for chronic asthma management in the 2007 guidelines from NIH/NHLBI | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |
| I believe that clinical decision support systems have the capacity for improving patient care | Pct respondents replying agree or strongly agree (categorical) OR mean result (continuous) | Survey of residents and pulmonologists | Y |

Evaluation Questions – Patient Outcomes

| Variable of interest | Operationalized variable | Data source: YNHH | Available pre-intervention? |
|---|--|-------------------------------|-----------------------------|
| Actual cough frequency | Pct of pts with moderate or severe impairment (per year for all pts with asthma in problem list? Per visit for ditto?) | Centricity | |
| Actual wheezing frequency | Pct of pts with moderate or severe impairment (per year for all pts with asthma in problem list? Per visit for ditto?) | Centricity | |
| Actual chest tightness frequency | Pct of pts with moderate or severe impairment (per year for all pts with asthma in problem list? Per visit for ditto?) | Centricity | |
| Actual nighttime awakenings | Pct of pts with moderate or severe impairment (per year for all pts with asthma in problem list? Per visit for ditto?) | Centricity | |
| Actual use | Pct of pts with moderate or severe impairment (per year for all pts with asthma in problem list? Per visit for ditto?) | Centricity | |
| Actual interference with normal activities | Pct of pts with moderate or severe impairment (per year for all pts with asthma in problem list? Per visit for ditto?) | Centricity | |
| Pulmonary function (spirometry, FEV1/FVC, PEFr) | Pct pts with any measurement? Yearly? Once? Post-exacerbation? | Centricity? Pulmonary lab? | |
| Asthma exacerbations | Rate of visits with chief diagnosis asthma exacerbation per pt with asthma per year | Centricity? | |
| Exacerbations requiring steroids | Rate per pt with asthma per year | Centricity? | |

Evaluation Questions – Patient Outcomes

| Variable of interest | Operationalized variable | Data source: YNHH | Available pre-intervention? |
|--|--|-----------------------|-----------------------------|
| Adverse effects of treatment | Pct of visits (or pts/year) with adverse effects documented in asthma form | Centricity | |
| ED Visits, hospitalizations, ICU (<i>missed school</i>) | Rate per pt with asthma per year | RIMS | Y |
| Lung growth (?) | ?? | ? | |
| Asthma action plan distribution | Y/N distribution per year? Per visit? | Centricity | |
| Patient education and encouragement of adherence | Y/N documentation for each visit with asthma in billing diagnosis code (or problem list) | Centricity | |
| Patient satisfaction: How are things going? | Pct of respondents answering good or very good | Patient/family survey | N |
| Patient satisfaction: Are you satisfied with asthma control? | Pct of respondents answering satisfied or very satisfied | Patient/family survey | N |
| Patient satisfaction: Are you satisfied with clinicians? | Pct of respondents answering satisfied or very satisfied | Patient/family survey | N |