6002 Final Project Proposal

Optimizing Asthma Management:
Implementation of the Asthmatic Smokers' Care Plan

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Introduction

What is Asthma?

Inflammation

Narrowing of the airways that carry air from the nose and mouth to the lungs
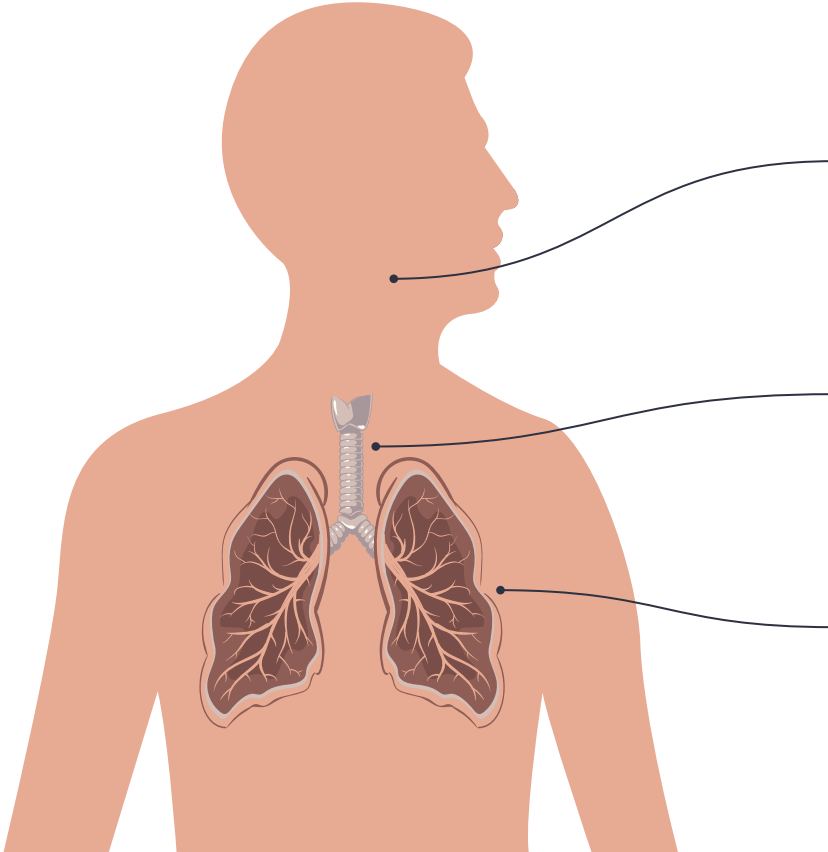
Swelling

Swelling of the airways and blockage by excess mucus

Shortness of breath

Trouble breathing, wheezing, coughing, and tightness or pain in the chest

("Asthma - Symptoms and causes," n.d.)

No cure

Currently, there is no cure for asthma, but appropriate treatment prevents asthma attacks and can help you have a better quality of life.

1 in 12

One of the most common diseases across the United States. More than 27 million people in the U.S. have asthma. This equals about 1 in 12 people.

$81.9 billion

The most costly disease in the United States. From 2008-2013, the annual economic cost of asthma was more than $81.9 billion – including medical costs and loss of work and school days
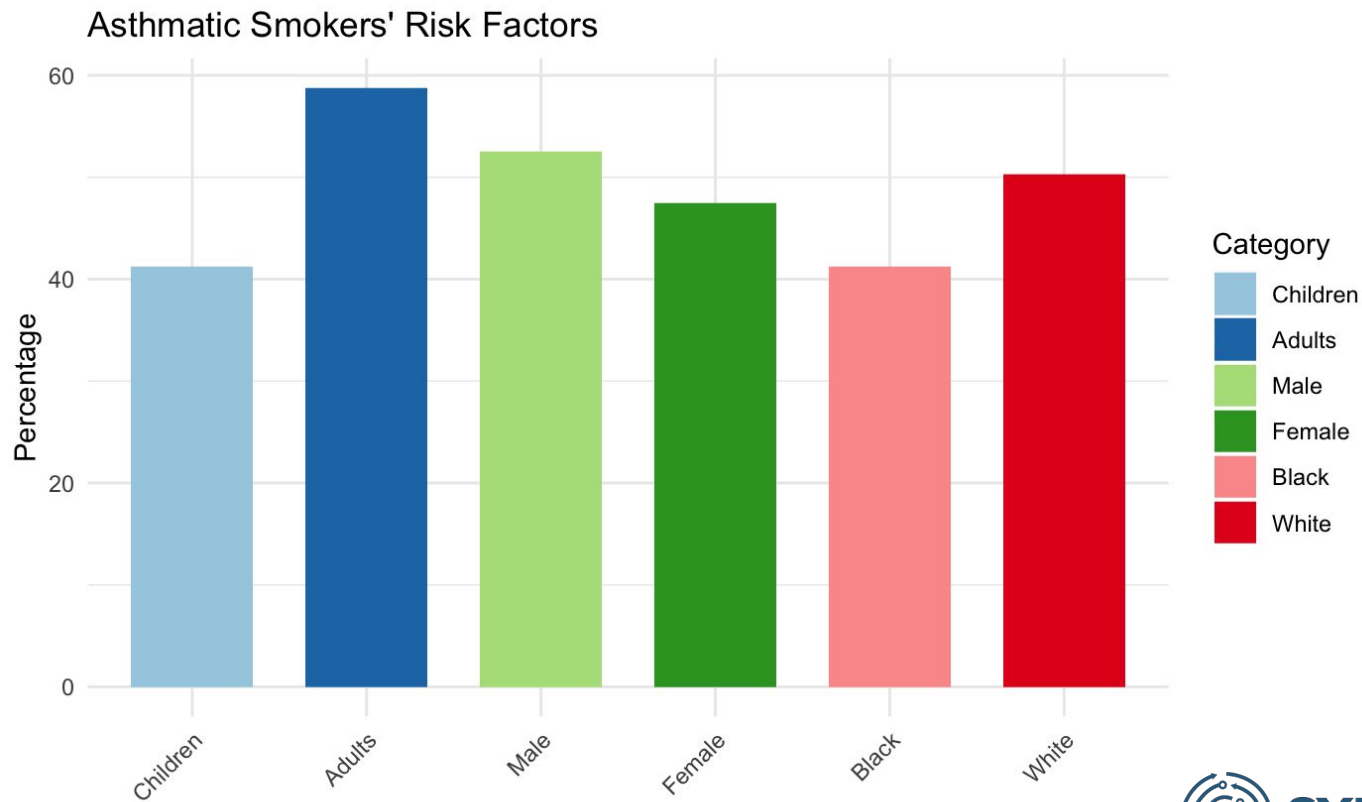
("Asthma Facts", Asthma and Allergy Foundation of America)

21% = 5.6 million

21% of the asthmatic patients smoke, even though cigarette smoke is known to trigger asthma attacks

("Asthma Facts", Asthma and Allergy Foundation of America)

Asthmatic Smokers' Risk Factors

02

Problem & Solution

Guidelines from the National Asthma Education and Prevention Program

U.S. Department of Health and Human Services
National Institutes of Health
National Heart, Lung, and Blood Institute

INITIAL VISIT

Diagnose asthma

↓

Assess asthma severity

↓

Initiate medication & demonstrate use

↓

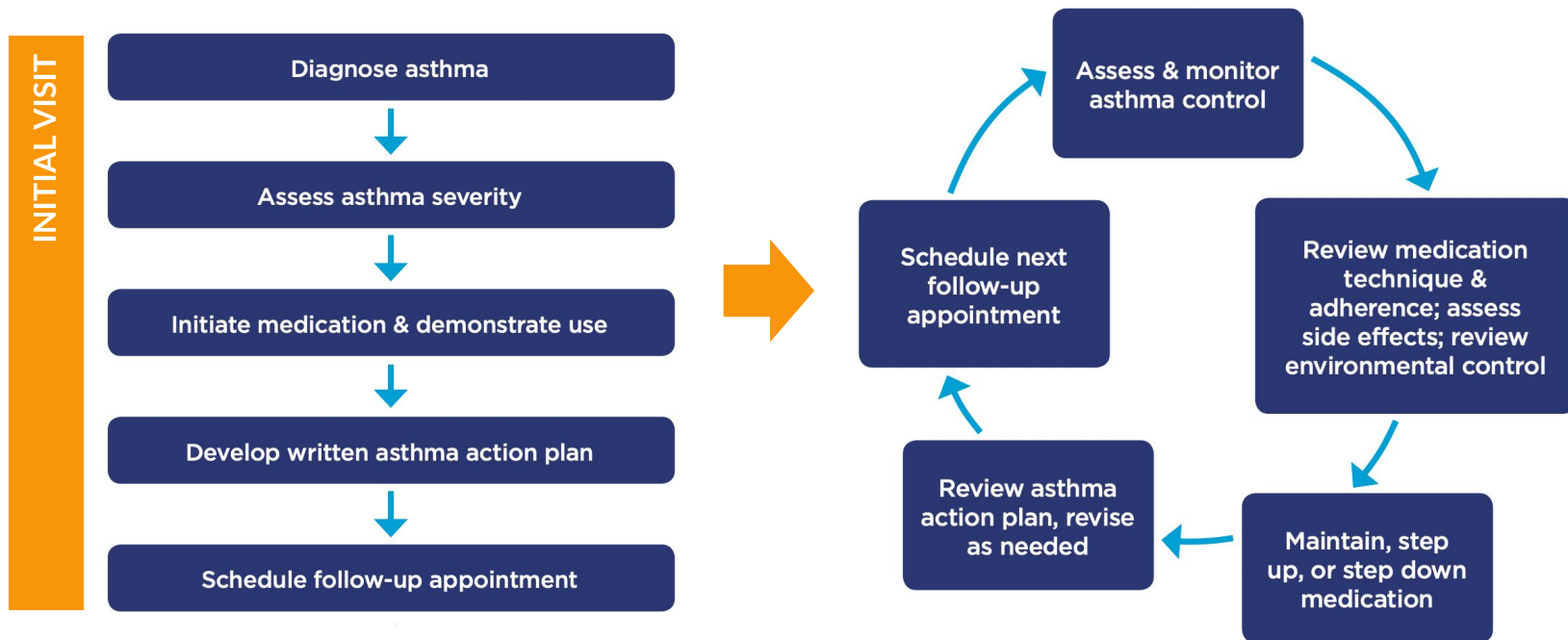Develop written asthma action plan
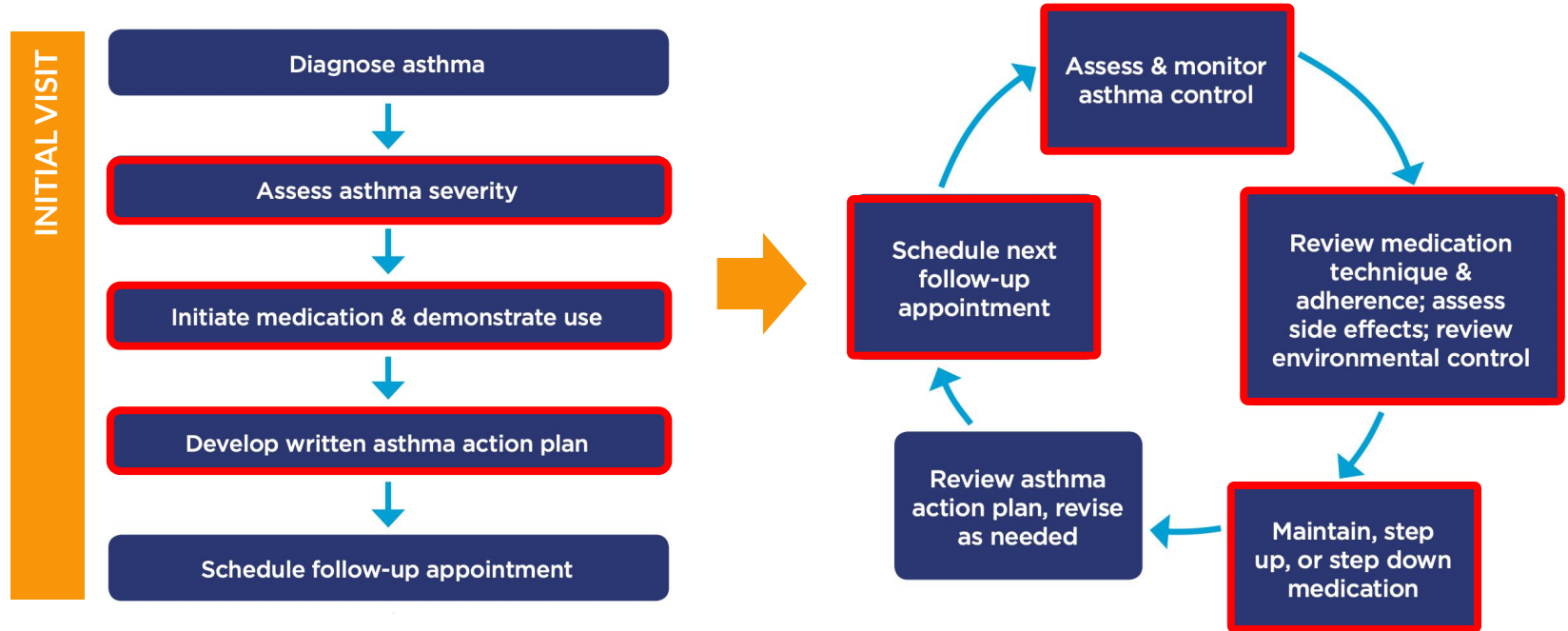
↓

Schedule follow-up appointment

Guidelines from the National Asthma Education and Prevention Program

U.S. Department of Health and Human Services
National Institutes of Health
National Heart, Lung, and Blood Institute

INITIAL VISIT

Diagnose asthma
↓
Assess asthma severity
↓
Initiate medication & demonstrate use
↓
Develop written asthma action plan
↓
Schedule follow-up appointment

Assess & monitor asthma control
→
Review medication technique & adherence; assess side effects; review environmental control
→
Maintain, step up, or step down medication
→
Review asthma action plan, revise as needed
→
Schedule next follow-up appointment
→
Assess & monitor asthma control

Issues identified for Asthmatic Smokers

INITIAL VISIT

Diagnose asthma

↓

Assess asthma severity

↓

Initiate medication & demonstrate use

↓

Develop written asthma action plan

↓

Schedule follow-up appointment

→

Assess & monitor asthma control

Schedule next follow-up appointment

Review medication technique & adherence; assess side effects; review environmental control

Review asthma action plan, revise as needed

Maintain, step up, or step down medication

Issues identified for Asthmatic Smokers

INITIAL VISIT

Diagnose asthma

↓

No Asthmatic Smoker Care Plan

Asthma Careplans Types for Asthmatic Smokers

Issues identified for Asthmatic Smokers

INITIAL VISIT

| Diagnose asthma |

↓

| No Asthmatic Smoker Care Plan |

↓
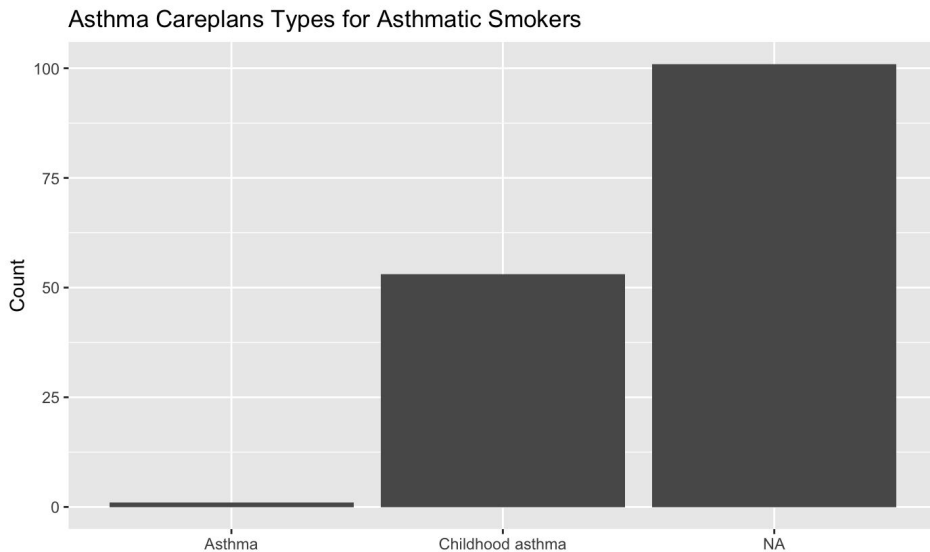
| Inappropriate treatment |

- Asthma Self Management Plan
- No Smoking Cessation Therapy records
- Misrepresentation of Inhaler Steroid Therapy
  (only Budesonide listed as corticosteroid)

("Synthea Module Builder - Asthma," n.d.)
("Synthea Generic Module Builder," n.d.)

Issues identified for Asthmatic Smokers

INITIAL VISIT

Diagnose asthma

↓

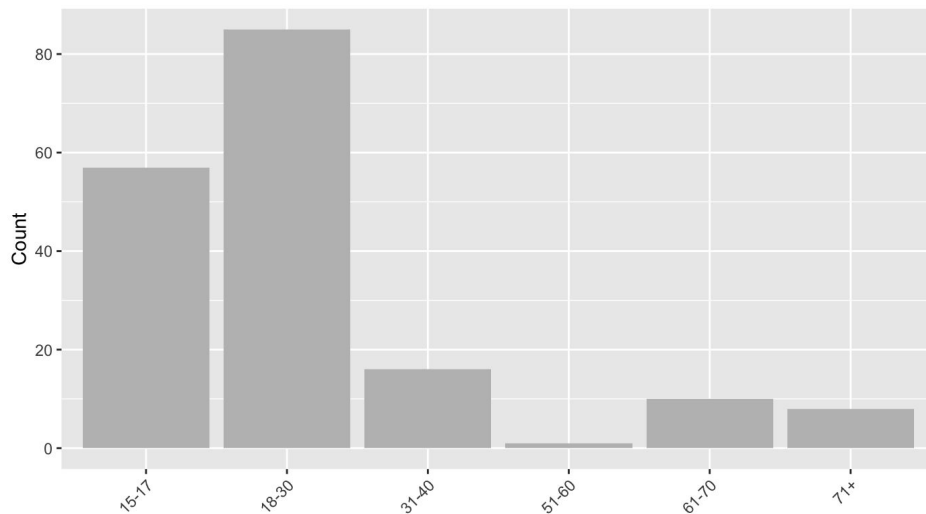| No Asthmatic Smoker Care Plan |
| :---: |

↓

Inappropriate treatment

↓

Inappropriate Action Plans

Asthmatic Smokers' Age Distribution

Issues identified for Asthmatic Smokers

INITIAL VISIT
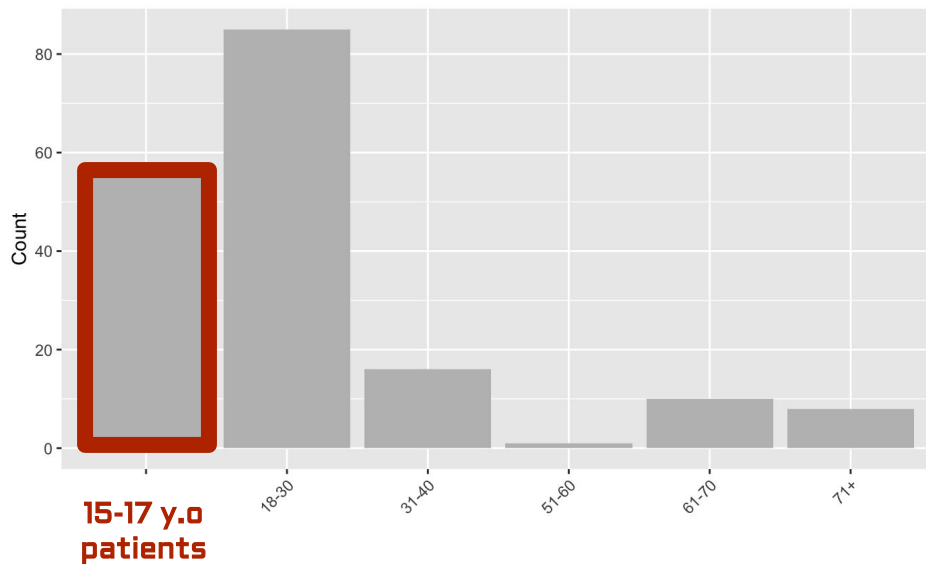
Diagnose asthma

↓

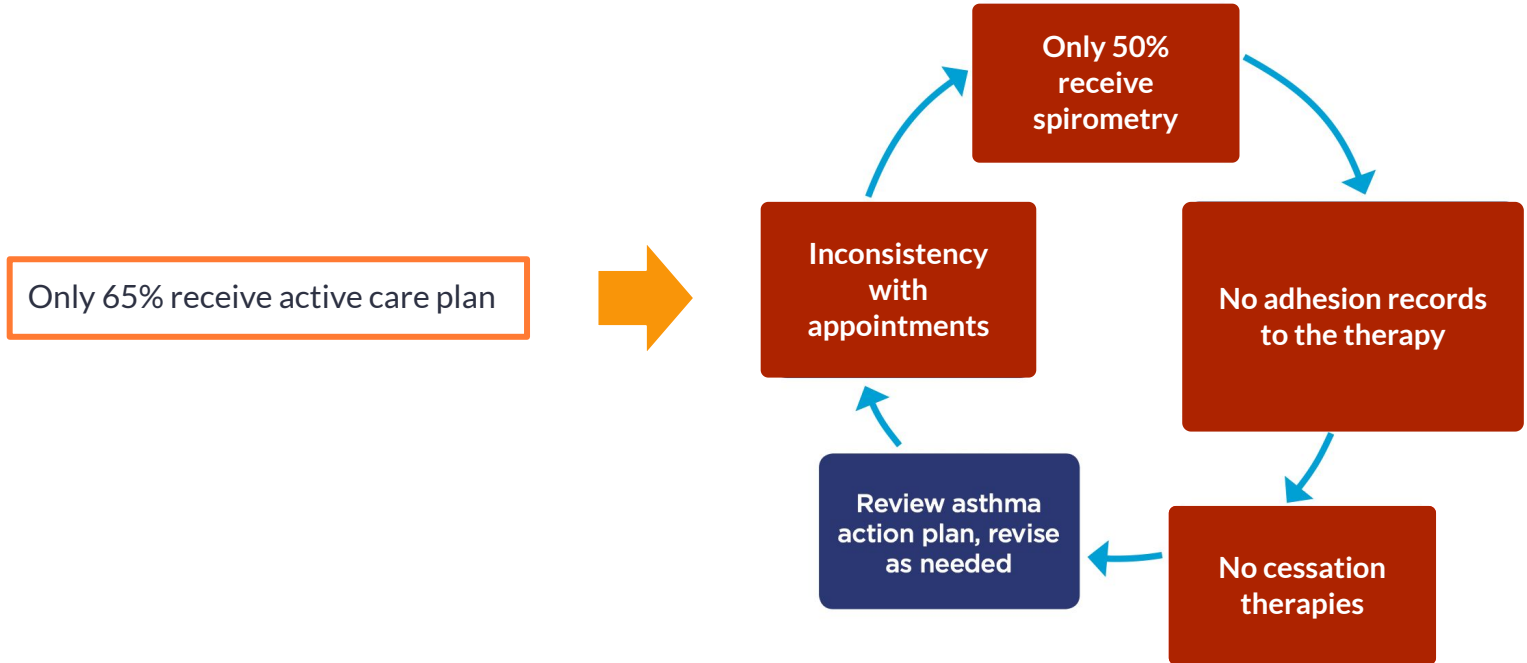No Asthmatic Smoker Care Plan

↓

Inappropriate treatment

↓

Inappropriate Action Plans

Asthmatic Smokers' Age Distribution

15-17 y.o patients

Issues identified for Asthmatic Smokers

Only 65% receive active care plan

Only 50% receive spirometry

No adhesion records to the therapy

No cessation therapies

Review asthma action plan, revise as needed
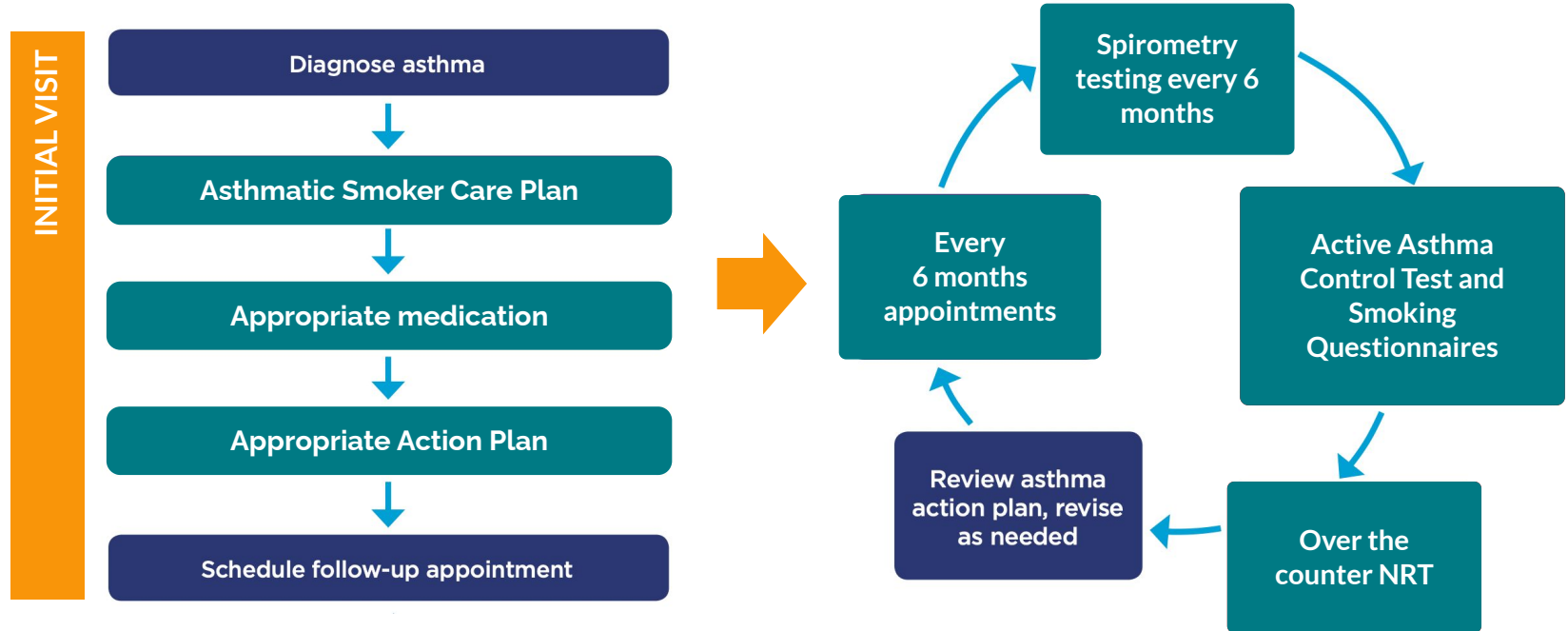
Inconsistency with appointments

Elements that need introduction

Elements	Description
Asthmatic Smoker Care Plan (ASCP) form	A consolidated form, highlighting all aspects of asthma care conjoined with smoking care
Spirometry test	Lung function measures performed every 6 months
Nicotine Replacement Therapy (NRT)	The use of nicotine product, the main component of Smoking Cessation Therapy
Asthma Control Test (ACT)	Bimonthly telehealth questionnaires to offer additional guidance

Issues identified for Asthmatic Smokers

INITIAL VISIT

Diagnose asthma

↓

Asthmatic Smoker Care Plan

↓

Appropriate medication

↓

Appropriate Action Plan

↓

Schedule follow-up appointment

→

Every 6 months appointments

Spirometry testing every 6 months

Active Asthma Control Test and Smoking Questionnaires

Over the counter NRT

Review asthma action plan, revise as needed

NRT = Nicotine Replacement Therapy

03

Pilot & Timeline

Pilot Design

Health Informatics Team

Pulmonology Department

Group A

Group B

Group C

Received the training & Implementation

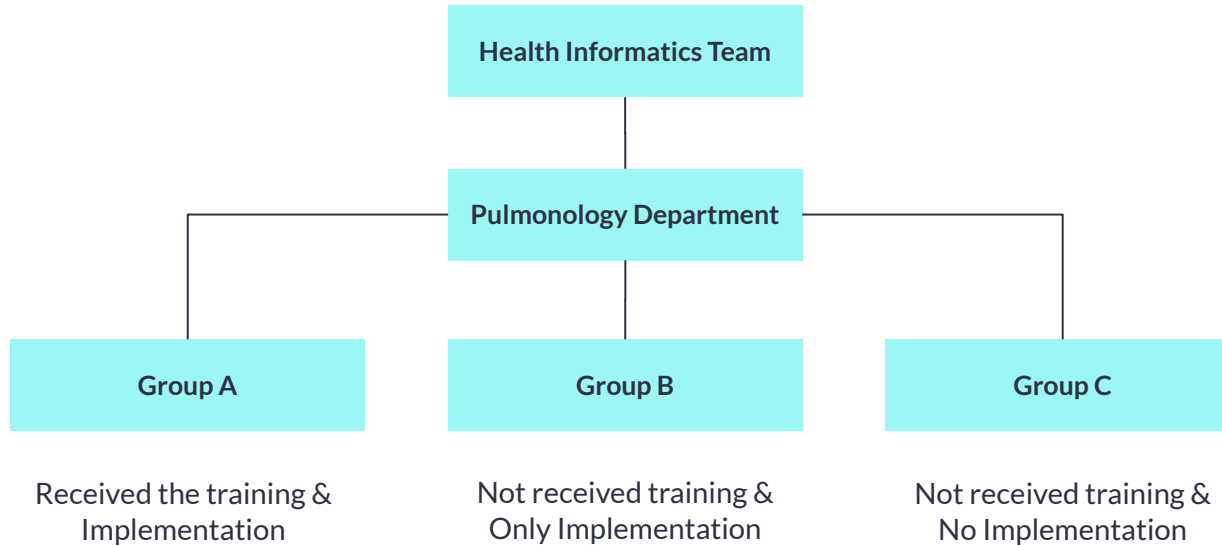Not received training & Only Implementation

Not received training & No Implementation

Outcomes Measures

Patient

- Smoking status
- Asthma symptom status
- Patient satisfaction survey

Hospital

- Time spent on new workflow
- Employee satisfaction survey

Implementation Roadmap

Initiative	Dec	Jan	Mar	Apr	May	Jun	Objective
Deficiency & Research	■						Identification of our cohort, deficiencies, evaluation using SWOT analysis
Develop a prototype	■	■					OpenEMR changes and prototype testing, construction of the pilot design
Test for usability		■	■				OpenEMR small cohort run with implementation
Analyze feedback				■			Additional implementation (if required) based on pilot study feedback
Staff training					■		Training for new workflow implementation to related staff members
Implementation						■	Introduction of new workflow to practice

04

Live Demo

Overview of the Workflow for the patient

ASCP form
Spirometry test
NRT

Repeat ASCP form
Repeat Spirometry
Update the NRT

Asthmatic
Smoker

2 months

4 months

6 months

Telehealth Questionnaires
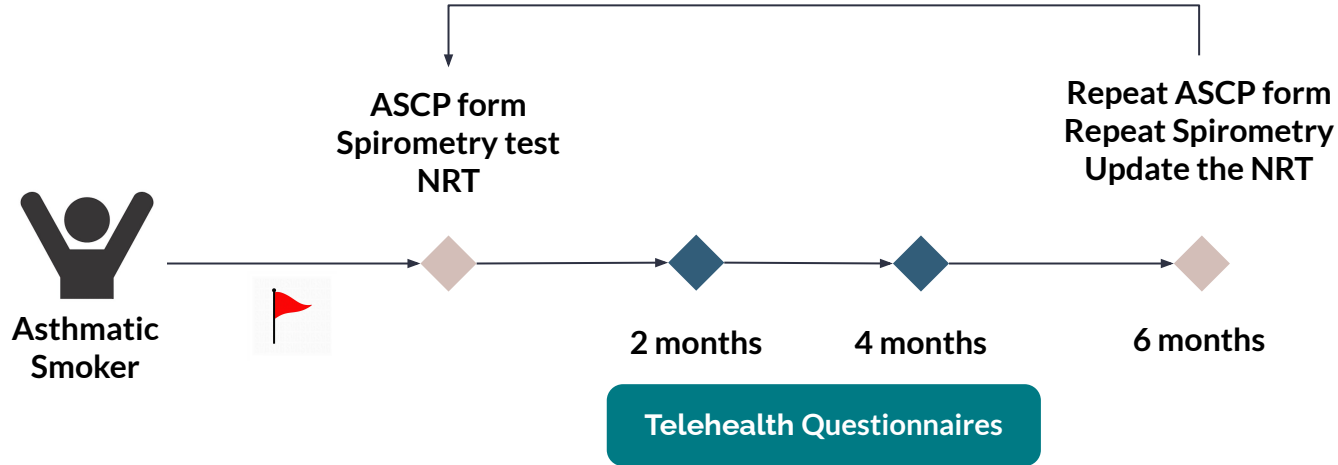
Overview of the Workflow for healthcare team

openEMR

**ASCP form
Spirometry test
NRT**

**Repeat the ASCP form
Repeat Spirometry
Update the NRT**

Clinician

Alerts

2 months

4 months

Alerts

6 months

Telehealth Questionnaires

Demo ON
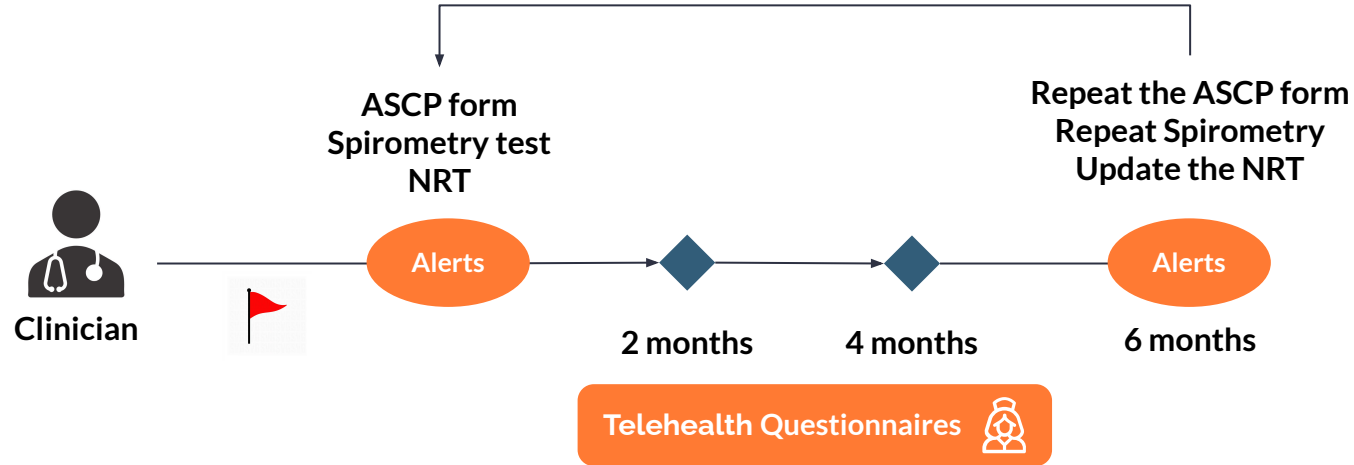
Management Overview

Team Member	Key Tasks
Physician (pulmonologist)	Administering asthma care during encounters, completing ASCP form, and updating prescriptions
Pulmonary nurses	Completing spirometry tests + follow-up
Asthma educator	Conducting telehealth questionnaires, offering asthma education
Respiratory therapist	Offering asthma education, such as inhaler usage (*new patients)

Dr. Cobb   Dr. R

Total training time per professional:
1 hour/ month

05

Feasibility Evaluation

Elements Considered for Estimation

Investment

- **Software upgrade**
- **Staff training**

Expenses

- **No. of encounters**
- **No. of ER visits**
- **Admissions (length of stays)**
- **Spirometry test**

Revenue

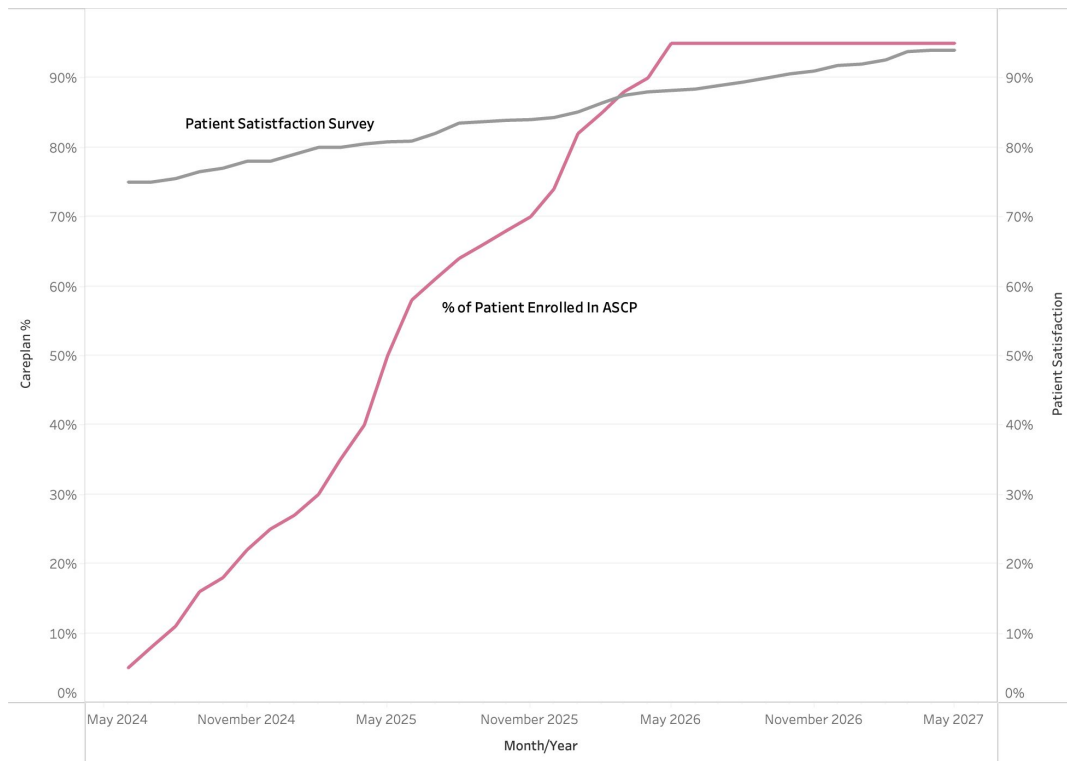- **Patient satisfaction**

Clinical Improvements
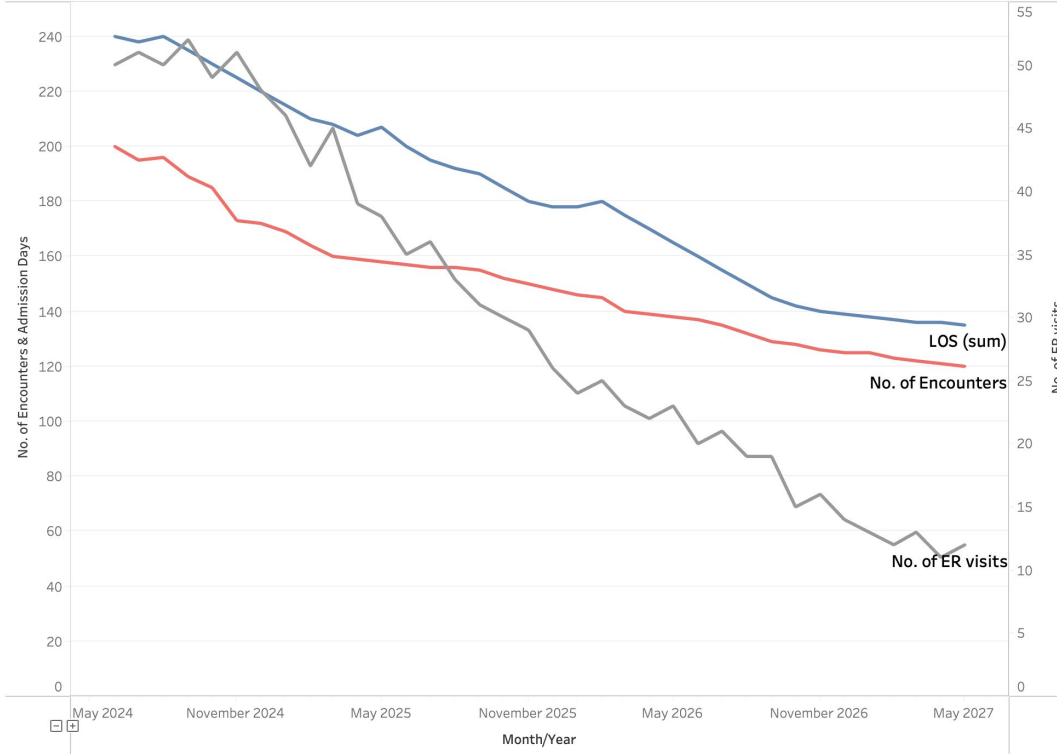
Number of hospital admission days

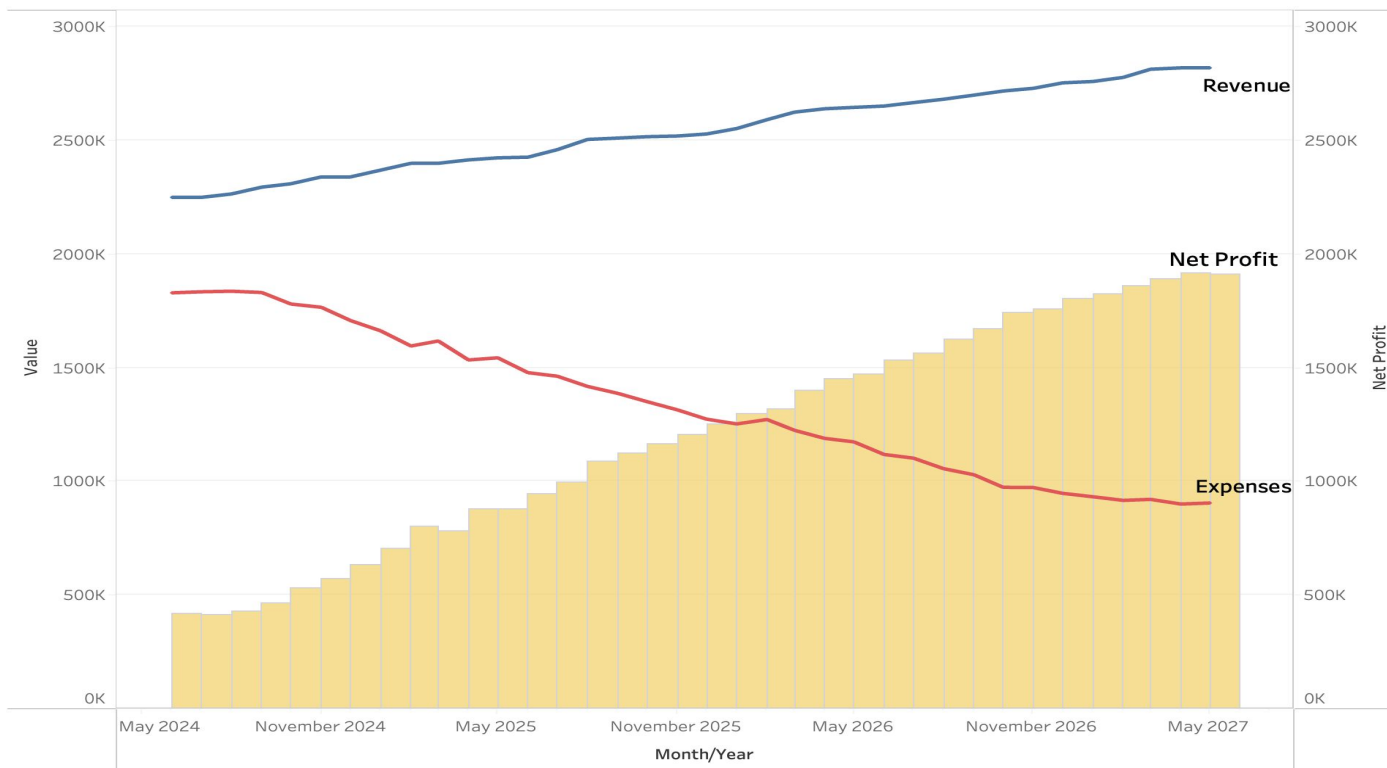Number of encounters

Number of ER visits

Patient Improvement

Patient Satisfaction
(Patient survey results)

% of patients enrolled in
Asthmatic Smokers
Care Plan (ASCP)

3 Year Revenue & Expenses Forecast

Profit Change

Chart showing Revenue (blue line), Net Profit (yellow area/bars), and Expenses (red line) forecast by Month/Year from May 2024 to May 2027. Value axis (left) and Net Profit axis (right) both range from 0K to 3000K.

ASCP Cost Structure Projection

Revenue Gain

+

- Lower admission, encounter, ER visits
- Higher patient satisfaction

—

Investment

Software upgrade	**$10,000**
Staff training*	**$12,000**

1 hour per month for the starting 6 months (pilot study included)

Cost

- More spirometry tests

KPIs for New Workflow
: Forecast Breakdown

Unit: mil USD

Timeline	Revenue	Cost**	Profit
1st Year	28.1	20.5	7.6
2nd Year	30.5	15.8	14.7
3rd Year	32.9	11.8	21.1

Unit: mil USD

Direct cost incurred related to new plan included only.
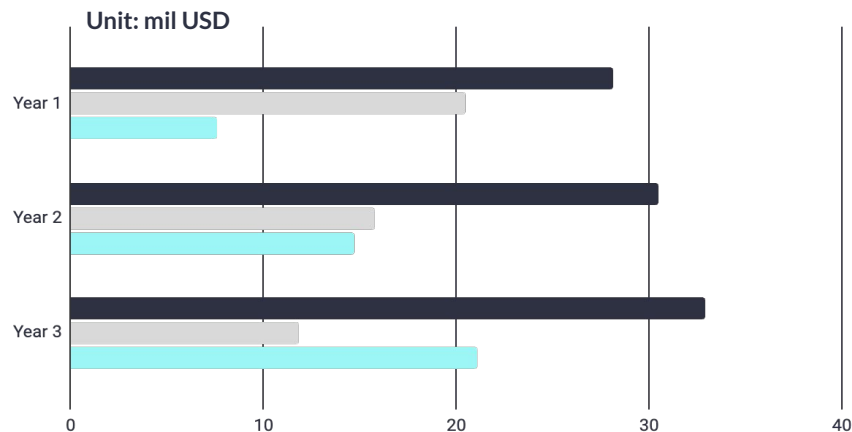
$4,836,000
Revenue increase*

$8,766,500
Cost decrease*

$13,602,500
Profit increase*

*3rd year following new plan implementation

Live Demonstration

50% reduction

Overall expenses for asthmatic smoker patient care

20% increase

Patient satisfaction

Quality Care

Lower ER visits, admissions, and better clinical results

06

Conclusion & Future Work

ADVANTAGES +

+ Simple implementation

+ Compliance with guidelines

+ Cost & time effective strategy

+ Patient accessibility (over the counter, telehealth)

DISADVANTAGES −

— Long-term treatment

— One treatment type for cessation therapy

— Not looking at the other comorbidities

OPPORTUNITIES +

+ No extra cost hiring is needed

+ Patient pool = existing patient

+ Additional treatment in cessation

+ Patient satisfaction

RISKS −

— Alerts/Form Fatigue

— Patient noncompliance

— Technical difficulties

— Additional Time Spent on the Patient - 2 hours per providers

Further Improvements

openEMR

Electronic Asthma Management System (eAMS)

Systematically developed and evidence-based computerised decision support tool

Interactivity

Educational resources, questionnaires, and more on patient portal

Incorporation of conditional logic for certain form elements to appear/disappear based on user's responses
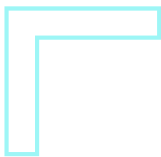
Real-time monitoring

Integrating visualization tool (Tableau) within the EMR system

Consistency Checking

Data quality assurance and validity, error detection and correction, real-time validation of rules, fields,

Thank you for your attention

References

2021 National Health Interview Survey (NHIS) Data | CDC [WWW Document], 2023. URL https://www.cdc.gov/asthma/nhis/2021/table4-1.htm (accessed 12.11.23).

Asthma - Symptoms and causes [WWW Document], n.d. . Mayo Clinic. URL https://www.mayoclinic.org/diseases-conditions/asthma/symptoms-causes/syc-20369653 (accessed 12.11.23).

Asthma Care Quick Reference: Diagnosing and Managing Asthma, n.d.

Asthma Facts [WWW Document], n.d. . Asthma & Allergy Foundation of America. URL https://aafa.org/asthma/asthma-facts/ (accessed 12.8.23).

CDC, 2023. Do you have an Asthma Action Plan? [WWW Document]. Centers for Disease Control and Prevention. URL https://www.cdc.gov/asthma/actionplan.html (accessed 12.11.23).

Gupta, S., Price, C., Agarwal, G., Chan, D., Goel, S., Boulet, L.-P., Kaplan, A.G., Lebovic, G., Mamdani, M., Straus, S.E., 2019. The Electronic Asthma Management System (eAMS) improves primary care asthma management. Eur Respir J 53, 1802241. https://doi.org/10.1183/13993003.02241-2018

RevCycleIntelligence, 2016. High Patient Experience Scores Boost Hospital Net Margins by 50% [WWW Document]. RevCycleIntelligence. URL https://revcycleintelligence.com/news/high-patient-experience-scores-boost-hospital-revenue-by-50 (accessed 12.11.23).

Richter, J.P., Muhlestein, D.B., 2017. Patient experience and hospital profitability: Is there a link? Health Care Manage Rev 42, 247–257. https://doi.org/10.1097/HMR.0000000000000105

Sandhu, A., Hosseini, S.A., Saadabadi, A., 2023. Nicotine Replacement Therapy, in: StatPearls. StatPearls Publishing, Treasure Island (FL).

Synthea Generic Module Builder [WWW Document], n.d. URL https://synthetichealth.github.io/module-builder/#medications/maintenance_inhaler (accessed 12.11.23).

Synthea Module Builder - Asthma, n.d.