Individualized Respiratory Improvement through Standardized Execution (iRISE)

Part I : DMADV

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*I*ndividualized *R*espiratory *I*mprovement through *S*tandardized *E*xecution

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Define

Screening with spirometry is an important component in respiratory care for patients who have exposure to caustic materials. Early identification of changes in the core markers of lung function can prevent progression to disease manifestation which are often irreversible.

Current Issues:

- Current screening criteria may not be adequate for a young, health population due to respiratory reserve
- Changes in spirometry may occur before onset of symptoms without clear criteria
- No consistent standardized protocol has been developed to assist with screening assessment and follow up care for military members
- Lack of understanding regarding current population spirometry data and its affects on readiness

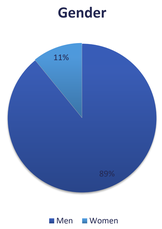
Goals

- Analyze current population spirometry data to determine trends and normalizations curves
- Research and establish standardized criteria for screening and referral based on these results
- Create streamline treatment approach to care for future patients

Measure

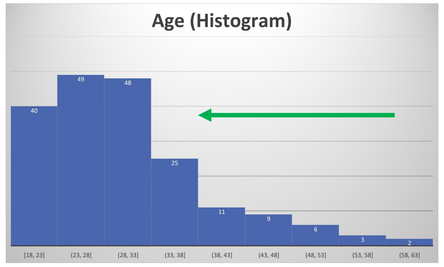
A total of ***193 patients*** with spirometry data were identified over the past year and included in the analysis. Patients were selected from those who participated in the annual surveillance program conducted by the Occupational Medicine department based on exposure to mixed solvents, isocyanates, and respirator screening. Only duplicate data entry and poor-quality studies as defined by the American Thoracic Society (ATS) were excluded from the analysis

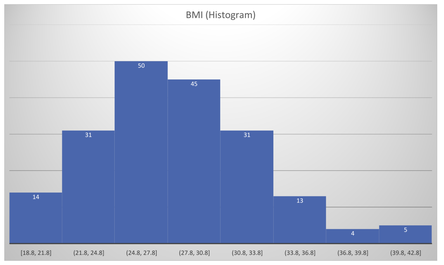
Demographic



Gender: A majority of the patients (89%) were male.

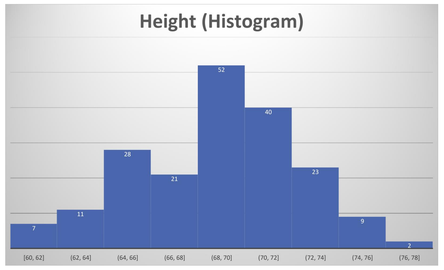
Analyze – Key Demographics

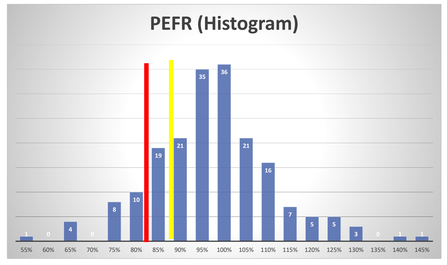




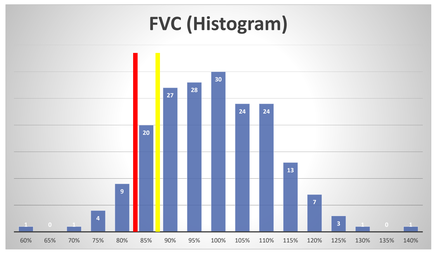
Results

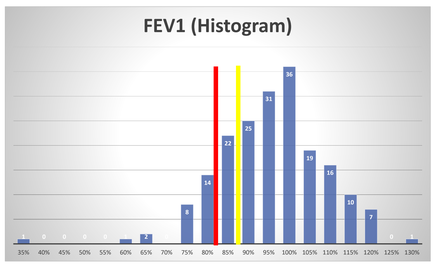
- **Age:** Average age was ***30.8 +/- 8.8 years*** with a median age of 30 years. The data is leftward skewed which is expected for a military based population
- **Height:** Average height was ***69.3 +/- 3.49 inches*** with a median height of 70 inches.
- **BMI:** Average BMI was ***28.3+/- 4.7*** with a median BMI of 28.





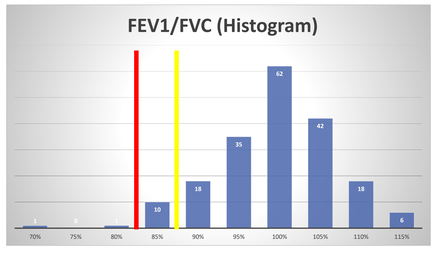
Analyze – Spirometry

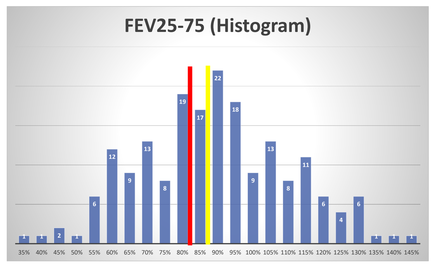




Results

- **FVC:** Average FVC was ***96% +/- 12%*** with a median FVC of 96%
- **FEV1:** Average FEV1 was ***93% +/- 14%*** with a median FVC of 94%
- **FEV1/FVC**: Average FEV1/FVC was ***93% +/- 14%*** with a median FEV1/FVC of 94%
- **FEV25-75%:** Average FEV1/FVC was ***88% +/- 24%*** with a median FEV1/FVC of 86%
- **PEFR:** Average FEV1/FVC was ***95% +/- 14%*** with a median FEV1/FVC of 95%





Design

Based on the data and trends in the population, a standardized approach to screening and referrals was developed to assist in the determination of irregular findings from the spirometry data.

Design Criteria:

- Establish spirometry criteria for the determination of early restrictive, obstructive, and small air way disease
- Design a process which is based on the best available evidence from peer-reviewed, respected clinical journals
- Adopt a proactive screening process as focus is on prevention and ***NOT*** diagnosis of pathology.
- Ensure integrity and physician review with differentiation at transitions points in referral pathways
- Provide a tiered system standard which can be replicated easily in the clinic
- Determine effects of screening process on readiness of patients to meet work responsibilities during interim evaluation
- Establish longitudinal requirements for interval changes in spirometry data

Design - Process

Based on the design criteria, a comprehensive review of the available literature was conducted. Only articles with evidence-based results, peer-reviewed, or established guidelines by major medical societies were considered. Smaller scale studies or inconclusive findings were discussed as to its impact on future spirometry screening. All studies not meeting the above criteria were exclude from the design process.

Design – Levels

Disease Process:

- Obstructive
- Restrictive
- Mixed
- Small Airway disease

Levels of Care

- **Green**: within normal limits for age, height, and weight
- **Yellow**: within transition zone
- **Red**: meet criteria for disease process

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