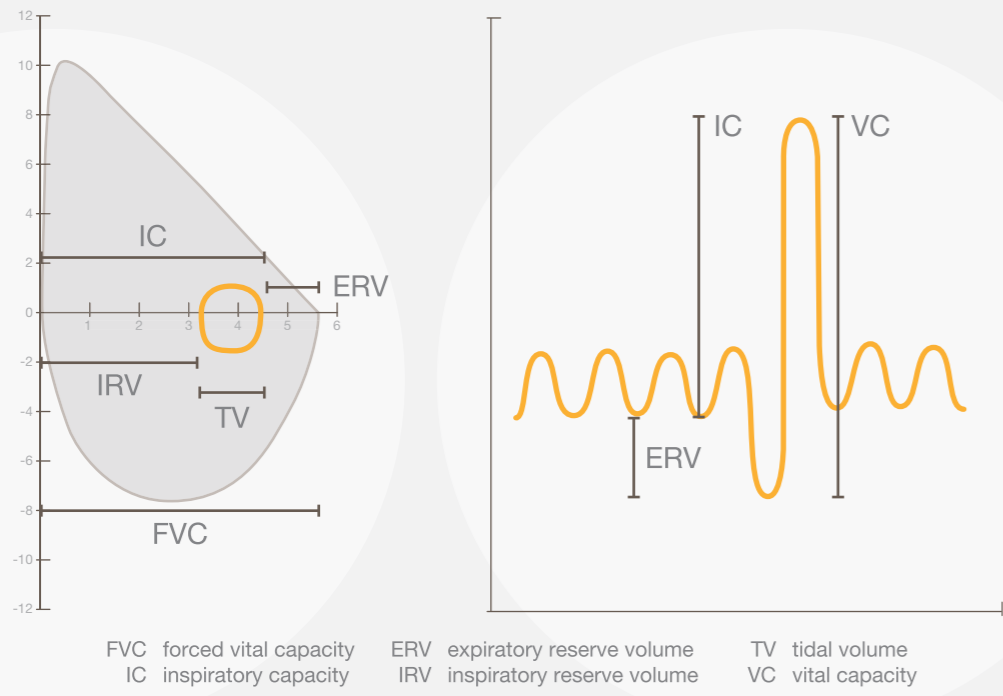
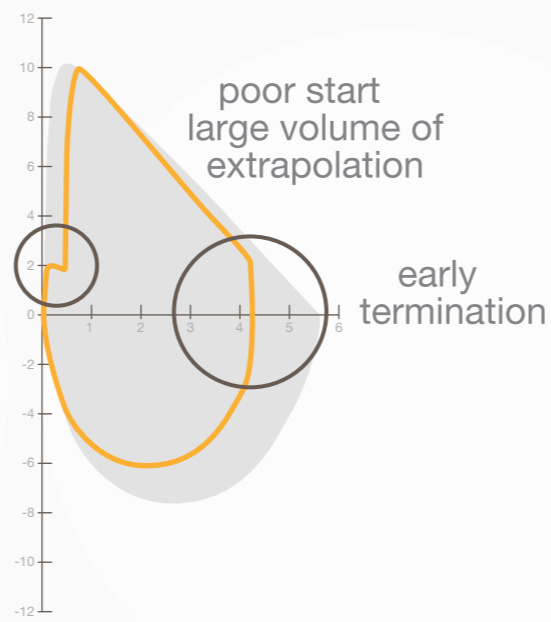


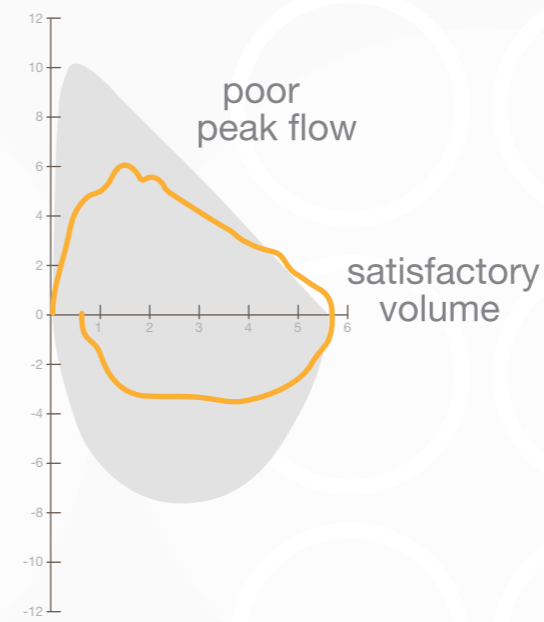
Flow Volume Loop in Health and Disease



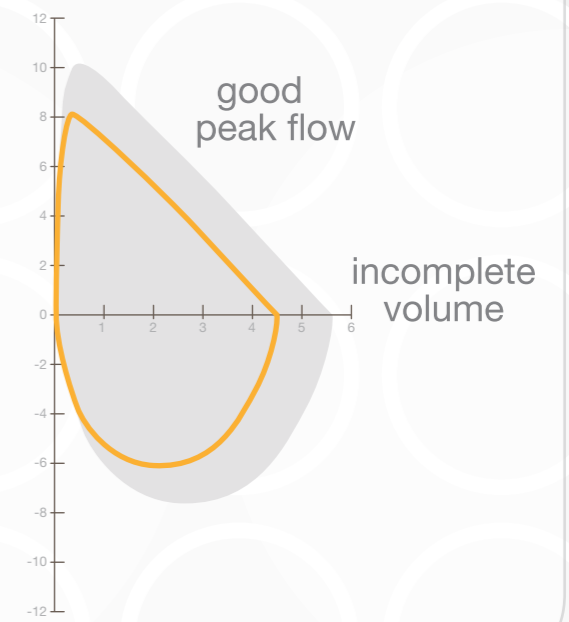
Effort-Related
Poor start (or cough)
Early Termination



Effort-Related
Poor expiratory flow
Good volume



Effort-Related
Good expiratory flow
Poor volume



Obstructive

An obstructive ventilatory defect is a disproportionate reduction of maximal airflow from the lung in relation to the maximal volume (i.e. VC) that can be displaced from the lung. The degree of abnormality can be defined using the number of standard deviations from the norm (Z-scores), percentiles (1-5) from the reference value, lower limits of normal, or the percentage of the reference value.

step 1:
identify presence of obstruction

ratio of FEV1 divided by VC (FEV1/VC)
is reduced or below the lower limits of normal

step 2:
identify degree of obstruction

FEV1 % pred

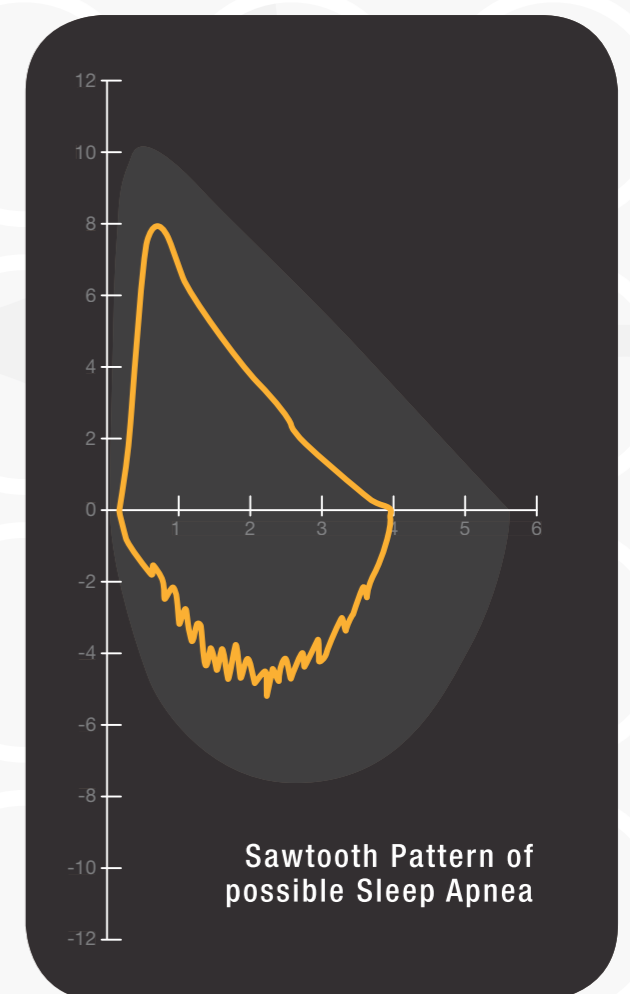
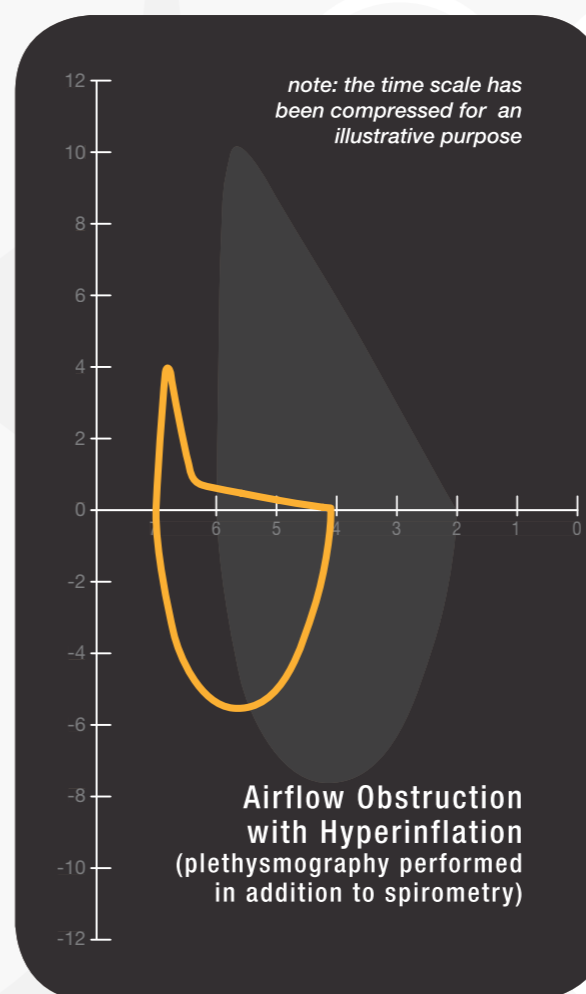
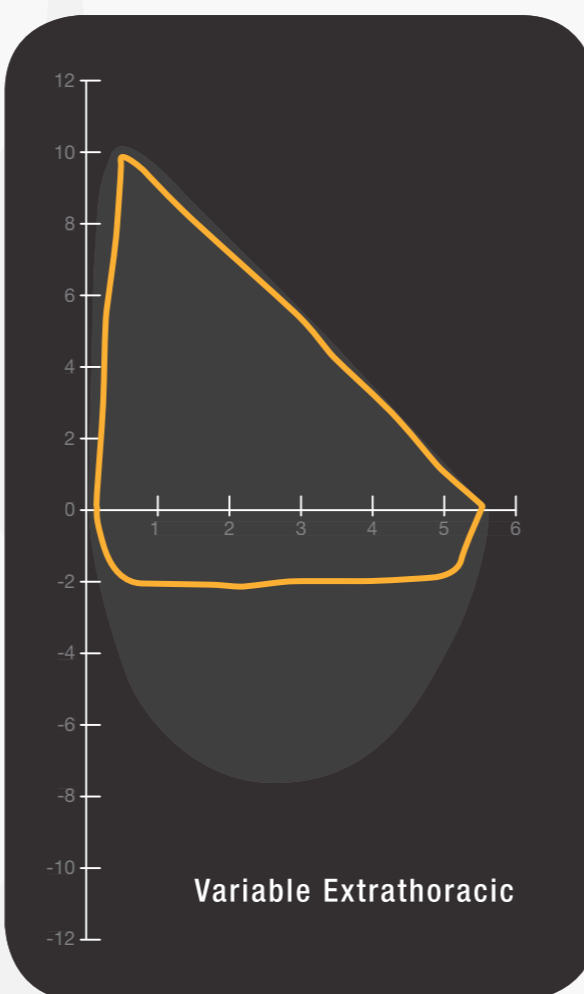
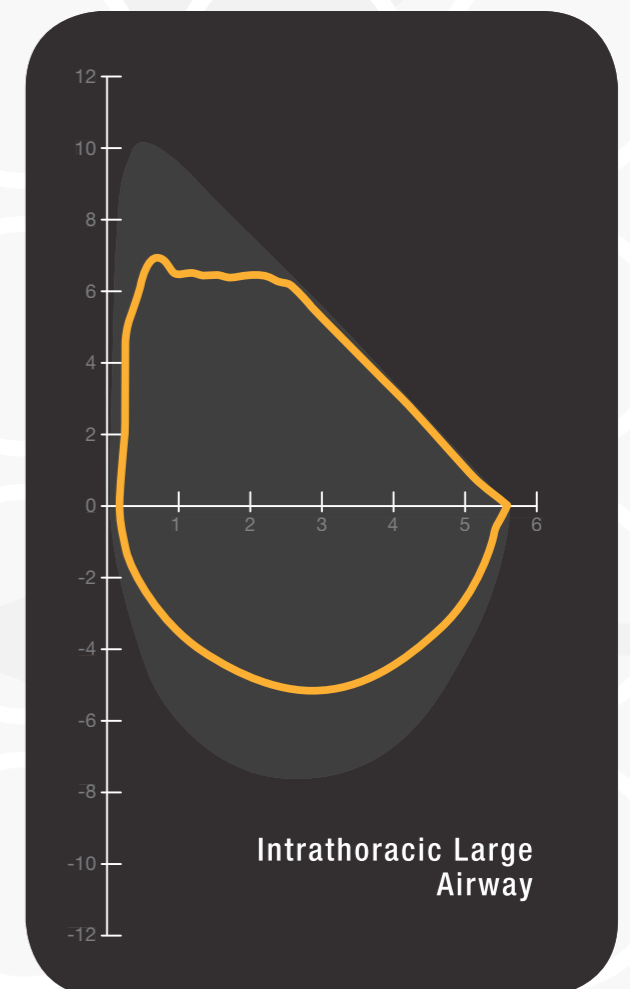
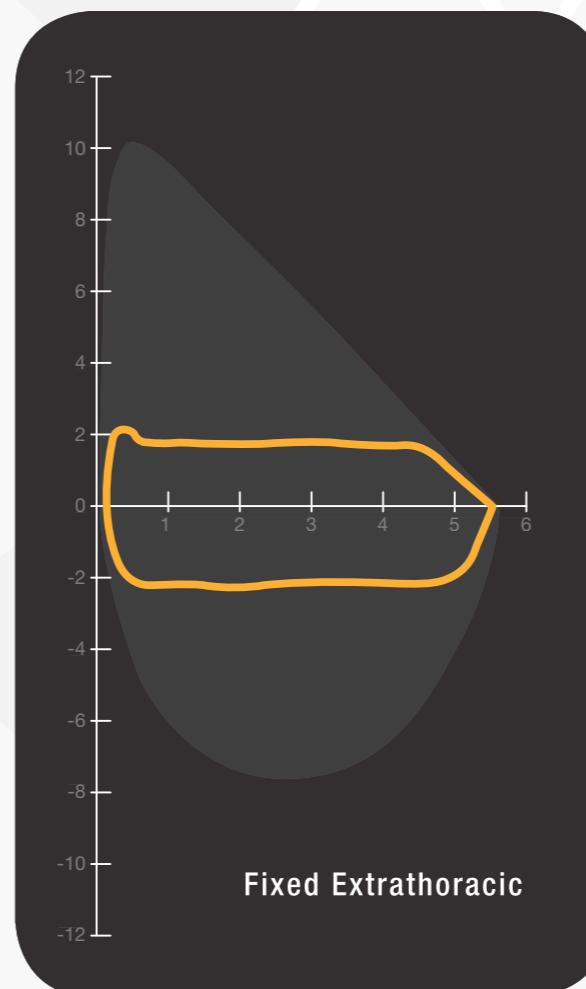
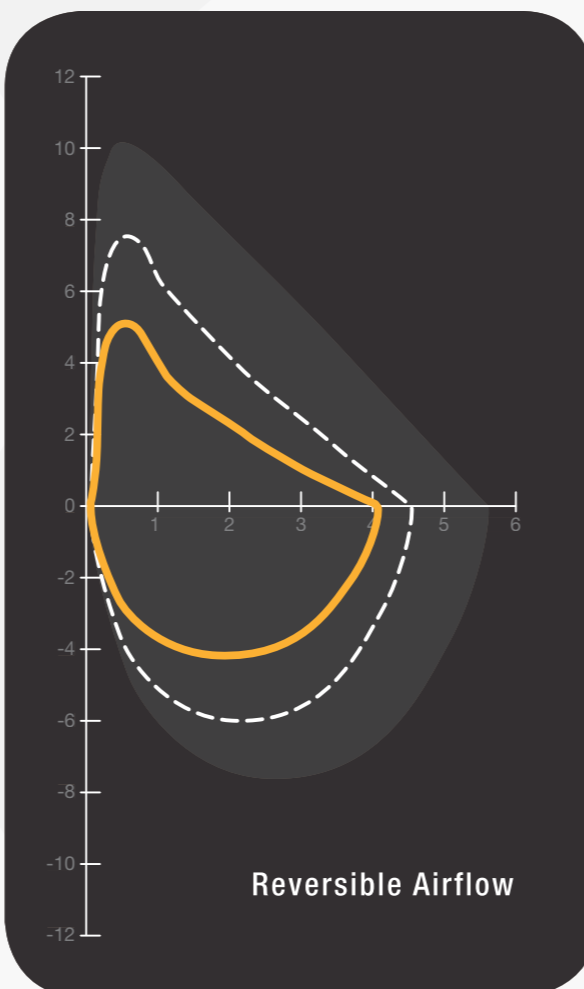
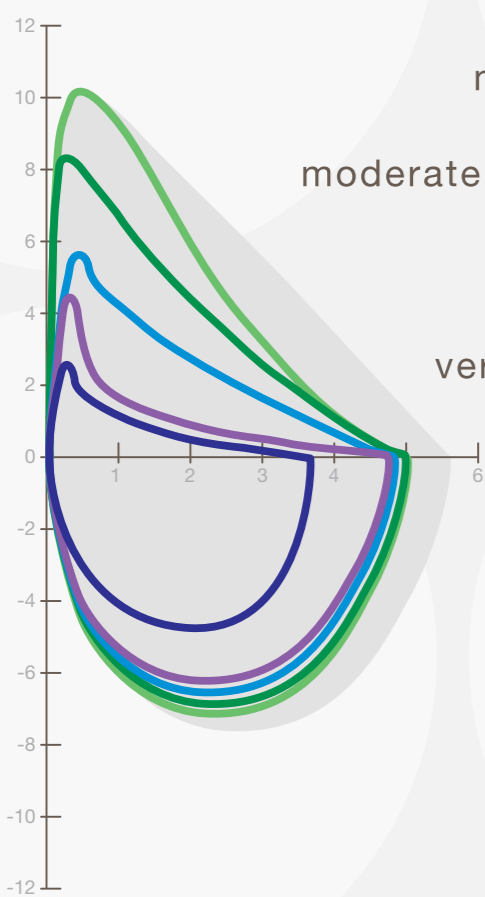
mild ● 70-79

moderate ● 60-69

moderately severe ● 50-59

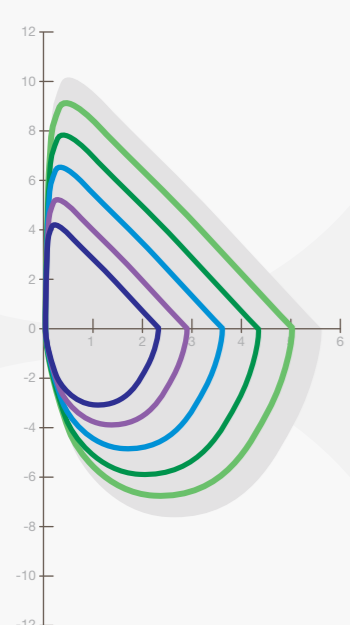
severe ● 35-49

very severe ● <35



Restrictive

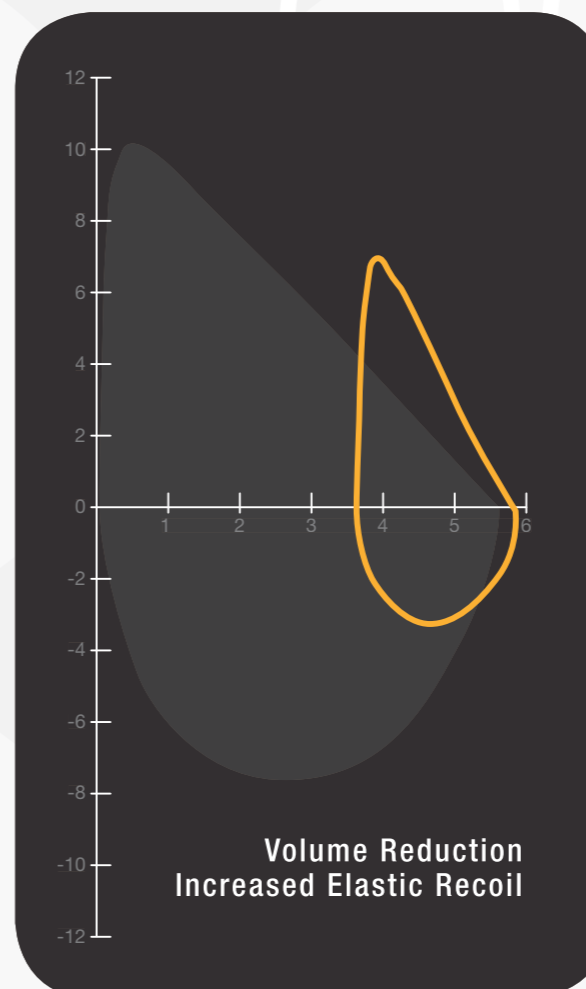
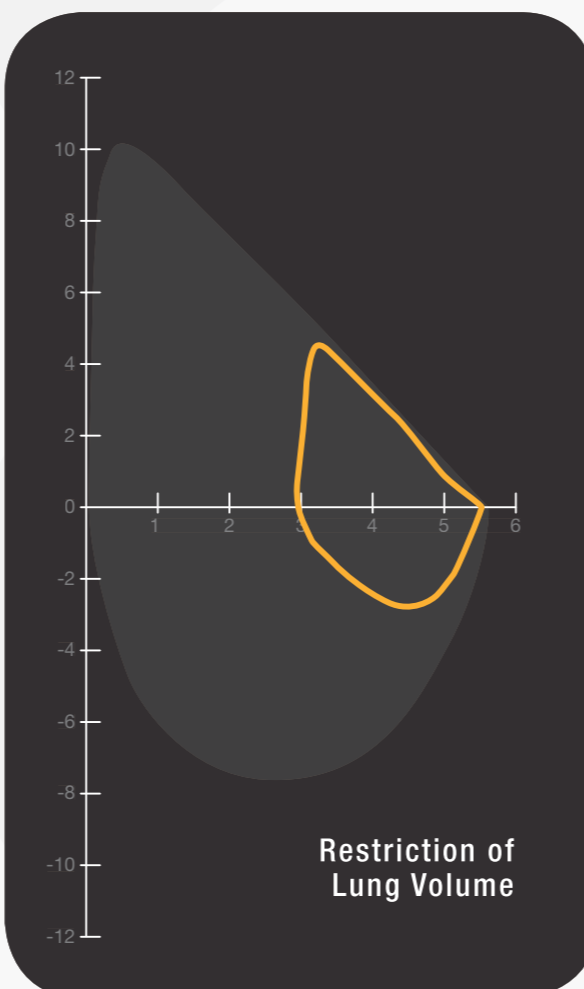
A restrictive ventilatory defect is the reduction of total lung volume. Since the airways are normal, the flow volume loop will have a normal shape, only smaller with a lower pointed peak flow and volume.



To obtain an accurate diagnosis and totally eliminate the opportunity for effort-related results, spirometry and plethysmography or nitrogen washout is strongly recommended.

Spirometry with good expiratory effort and inaccurate measurement of volume can suggest restriction.

If restriction is present, plethysmography or nitrogen washout can confirm the degree.



For additional information on pulmonary diagnostics,
please consult the ATS/ERS guidelines:

www.thoracic.org ||| www.ers-education.org

references:
Standardisation of Spirometry; ATS/ERS Task Force Standardisation of Lung Function Testing.
Eur Respir J 2005; 26:319-338.
Interpretative Strategies for Lung Function Tests; ATS/ERS Task Force Standardisation of Lung
Function Testing. Eur Respir J 2005; 26:948-968.

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through its subsidiary Medical Graphics Corporation

350 Oak Grove Parkway
St. Paul, Minnesota USA 55127-8599

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