bolism was classified as sub-massive. It must be pointed out that all the patients in the NHLI study had serious pulmonary vascular obstruction (average, half of one lung), since the criteria for eligibility excluded those with small pulmonary embolism.

Massive or Submassive Embolism

Symptoms such as pleural pain and syncope, and physical findings of tachypnea, rales, loud pulmonary second sound, and cyanosis were considered in relation to the massivity of the embolism. The only symptoms that could be used to distinguish between massive and sub-massive embolism were pleural pain (associated with sub-massive embolic occlusion) and syncope (indicating massive embolism). As for physical signs, only loud pulmonary second sound, S_3 or S_4 gallop sounds, and cyanosis were pertinent. These findings more often reflected massive than sub-massive embolism. Only one-third of the patients had clinical evidence of thrombophlebitis.

The two definitive diagnostic procedures — perfusion lung scanning and selective pulmonary angiography—often cannot be performed at the critical time because most hospitals are not equipped to provide these services 24 hours a day, seven days a week. However, diagnostic evaluation for pulmonary embolism is incomplete without lung scanning, unless angiography has been performed.

If the lung scan is abnormal, confirmation by pulmonary angiography is very desirable, especially in patients with prior cardiopulmonary disease. But in certain patients, treatment may be started without angiographic confirmation when the lung scan shows lesions that have a "high probability" of being due to pulmonary embolism. Such patients are young persons without pre-existing cardiopulmonary disease, whose history and physical findings are compatible with the presence of pulmonary embolism.

When scanning and angiography have to be delayed, simpler tests may suffice for a provisional diagnosis. One such test is measurement of the arterial oxygen tension, which can be of value in excluding pulmonary embolism provided that certain modifications are adopted. First, the oxygen electrode must be calibrated with standard gas before each use. Second, the lower limit of normal for arterial oxygen tension should be established at 90 mm Hg, since higher tensions are rare among patients with pulmonary embolism. Therefore, if arterial oxygen tensions are to be used for diagnosis, calibration of the electrode prior to each measurement is essential to assure accuracy.

NHLI UROKINASE
PULMONARY EMBOLISM TRIAL

Presenting Symptoms

Symptom	Prevalence (%) All	Massive	Submassive
Dyspnea	81	79	83
Pleural pain	72	62	84*
Apprehension	59	61	56
Cough	54	50	60
Hemoptysis	34	27	44
Sweats	26	27	24
Syncope	14	22*	4

*Differences are significant.

UPET: Presenting Signs

Signs	Prevalence (%) All	Massive	Submassive
Rales	53	50	57
↑P_2	53	60*	44
Phlebitis	33	42	21
S_3, S_4	34	47*	17
Sweating	34	41	24
Cyanosis	18	28*	6
↑Respiration (>16)	87		
↑Pulse (>100)	44		
Fever (≥37.8)	42		

*Differences are significant.

Laboratory Findings

Test	Per cent Patients
LDH ↑	37
GOT ↑	26
HCT <35 per cent	23
BUN ≥20	18
Platelets (<200,000)	18
Bilirubin (>1mg/100 ml)	10

Frequency of CXR Abnormalities

Abnormality	Per cent Patients
Consolidation	41
High diaphragm	41
Pleural effusion	28
Plump pulmonary arteries	23
Atelectasis	20
LV ↑	16
Focal oligemia	15
RV ↑	5