Brief Overview of the ILO System for Classifying Chest Radiographs

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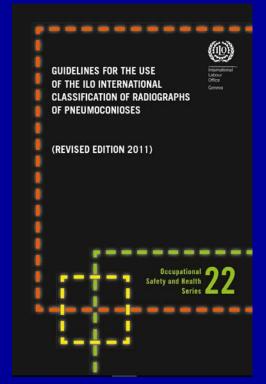
The findings and conclusions in this report are those of the author and do not necessarily represent the views of the National Institute for Occupational Safety and Health.





The ILO Classification





- International Conference on Silicosis, Johannesburg, 1930
 - Modifications/revisions 1950, 1959, 1970, 1980, 2002
 - Most recent revision 2011 for digital radiography
- "A means for describing and recording systematically the radiographic abnormalities in the chest provoked by the inhalation of dusts."

NIOSH "B" Reader Program

- Certifies licensed physicians as proficient in the classification of chest x-rays of the pneumoconioses using the International Labour Office (ILO) Classification System
- Developed in response to large inter-reader variability early in the Coal Worker's X-ray Surveillance Program.
- Fully operational since 1978.
- Self-study syllabus available
- "B" Reader: passed the B-reader certification examination.
- Information
 - https://www.cdc.gov/niosh/topics/chestradiography/breader.html
 - https://www.cdc.gov/niosh/topics/chestradiography/breader-info.html

NIOSH Form for ILO Classification Of Chest X-rays

Classified items:

- Film quality
- Abnormalities
 - Parenchymal
 - Pleural
 - Other

CHEST RADIOGRAPH CLASSIFICATION

Reset Form

FEDERAL MINE SAFETY AND HEALTH ACT OF 1977 DEPARTMENT OF HEALTH AND HUMAN SERVICES CENTERS FOR DISEASE CONTROL & PREVENTION

OMB No.: 0920-0020 Coal Workers' Health Surveillance Program DATE OF RADIOGRAPH (mm-dd-yyyy) CDC/NIOSH (M) 2.8 National Institute for Occupational Safety and Health REV. 01/2015 1095 Willowdale Road, MS LB208 Morgantown, WV 26505 FAX: 304-285-6058 EXAMINEE'S Social Security Number FACILITY Number - Unit Number TYPE OF READING A B F Full SSN is optional, last 4 digits are required Note: Please record your interpretation of a single radiograph by placing an "x" in the appropriate boxes on this form. Classify all appearances described in the ILO International Classification of Radiographs of Pneumoconiosis or Illustrated by the ILO Standard Radiographs. Use symbols and record comments as appropriate. Overexposed (dark) Improper position Underexposed (light) Poor contrast (If not Grade 1, mark all Poor processing Other (please specify boxes that apply) 2A. ANY CLASSIFIABLE PARENCHYMAL ABNORMALITIES? Complete Sections Proceed to NO 2B and 2C Section 3A SMALL OPACITIES e. PROFUSION 2C. LARGE OPACITIES b. ZONES LOWER ANY CLASSIFIABLE PLEURAL ABNORMALITIES? Complete Sections Proceed to YES NO Section 4A PLEURAL PLAOUES (mark site, calcification, extent, and width) Width (in profile only) Calcification Extent (chest wall: combined for (3mm minimum width required) in profile and face on) 3 to 5 mm = a Up to 1/4 of lateral chest wall = 1 5 to 10 nm = b /4 to 1/2 of lateral chest wall = 2 > 10 mm = c > 1/2 of lateral chest wall = 3 Proceed to Proceed to COSTOPHRENIC ANGLE OBLITERATION NO Extent (chest wall; combined for Width (in profile only) DIFFUSE PLEURAL THICKENING (mark site, calcification in profile and face on) (3mm minimum width required) extent, and width) Up to 1/4 of lateral chest wall = 1 3 to 5 mm = a 1/4 to 1/2 of lateral chest wall = 2 5 to 10 mm = b Calcification > 10 mm = c 1/2 of lateral cheet wall = 3 ANY OTHER ABNORMALITIES? Complete Sections 4B, 4C, 4D, 4E NO READER'S INITIALS PHYSICIAN'S Social Security Number⁴ DATE OF READING (mm-dd-yvyy) Full SSN is optional, last 4 digits are required PRINTED NAME (LAST, FIRST MIDDLE) SIGNATURE STREET ADDRESS CDC/NIOSH 2.8 (E), Revised January 2015, CDC Adobe Acrobat 11.0, S508 Electronic Version, August 2015

Save Form

Print

4B.	OTHER SYMBOLS (OBLIGATORY)		
	aa at ax bu ca cg cn co cp cv di ef em es	fr hi ho	id ih kl me pa pb pi px ra rp tb
aa	atherosclerotic aorta	hi	enlargement of non-calcified hilar or mediastinal lymph nodes
at	significant apical pleural thickening		noneycomb lung
ax	coalescence of small opacities - with margins of the small opacities remaining visible, whereas a large opacity demonstrates a		ll-defined diaphragm border - should be recorded only if more than one-third of one hemidiaphragm is affected
	homogeneous opaque appearance - may be recorded either in the		ll-defined heart border - should be recorded only if the length of the heart
	presence or in the absence of large opacities	1	oorder affected, whether on the right or on the left side, is more than
bu	bulla(e)		one-third of the length of the left heart border
ca	cancer, thoracic malignancies excluding mesothelioma calcified non-pneumoconiotic nodules (e.g. granuloma) or nodes		septal (Kerley) lines nesothelioma
cn	calcification in small pneumoconiotic opacities		plate atelectasis
CO	abnormality of cardiac size or shape		parenchymal bands - significant parenchymal fibrotic stands in continuity
cp	cor pulmonale cavity		with the pleura pleural thickening of an interlobar fissure
di	marked distortion of an intrathoracic structure		oneumothorax
ef	pleural effusion		ounded atelectasis
em	emphysema eggshell calcification of hilar or mediastinal lymph nodes		heumatoid pneumoconiosis uberculosis
fi	fractured rib(s) (acute or healed)		avacass,
	CARTA ATT DOTTO TOTAL DOTTO ATT AND		
4C.	MARK ALL BOXES THAT APPLY: (Use of this list is inte	ended to redu	ce handwritten comments and is optional)
	Abnormalities of the Diaphragm		
	□ Eventration		Lung Parenchymal Abnormalities
	Hiatal hemia		Azygos lobe
	Airway Disorders		☐ Density, hing ☐ Infiltrate
	☐ Bronchovascular markings, heavy or increased		□ Nodule. nodular lesion
	Hyperinflation		Miscellaneous Abnormalities
	Bony Abnormalities		☐ Foreign body
			Post-surgical changes/sternal wire
	Bony chest cage abnormality		☐ Cyst
	Fracture, healed (non-rib)		Vascular Disorders
	Fracture, not healed (non-rib)		Aorta, anomaly of
	Scoliosis		☐ Vascular abnormality
	☐ Vertebral column abnormality		•
			Date Physician or Worker notified? (mm-dd-yyyy)
4D.	Should worker see personal physician because of findings'	? YES	NO
	1 17		
4E.	OTHER COMMENTS		
		1	
	Save Form		Print
	Public reporting burden of this collection of information is estimated to searching existing data sources, gathering and maintaining the data nee		

Public reporting burden of this collection of information is estimated to average 3 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection information, including suggestings for reducing this burden to CDC, Project Clearance Officer, 1600 Clifton Road, MS D-74, Atlanta, GA 30333, ATTN: PRA (0920-0020). Do not send the completed form to this address.

Note: Please record your interpretation of a single radiograph by placing an "x" in the appropriate boxes on this form. Classify all appearances described in the ILO International Classification of Radiographs of Pneumoconiosis or Illustrated by the ILO Standard Radiographs. Use symbols and record comments as appropriate.							
1. IMAGE QUALITY	Overexposed (dark)	Improper position	Underinflation				
1 2 3 7/1	Underexposed (light)	Poor contrast	Mottle				
(If not Grade 1, mark all boxes that apply)	Artifacts	Poor processing	Other (please specify)				

Film quality:

- "1": good, free of technical imperfections or artifacts
- "2": acceptable, no technical defects or artifacts likely to impair classification of the radiograph for pneumoconiosis (minor positioning errors, handling artifacts not overlying heart or lungs)
- "3": acceptable, with technical defects or artifacts but still adequate for classification purposes (minor over- or under-exposure, minor departures from proper contrast)
- "4": unacceptable for classification purposes (gross over- or under-exposure, motion, poor film screen contact, poor contrast)

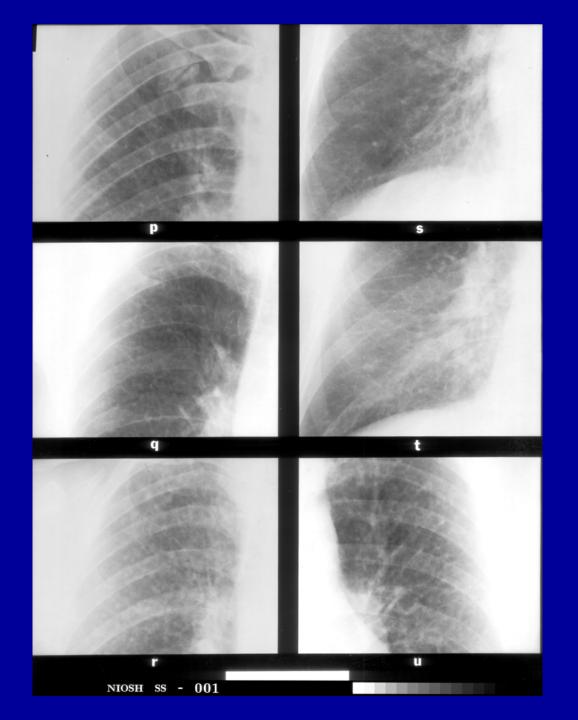


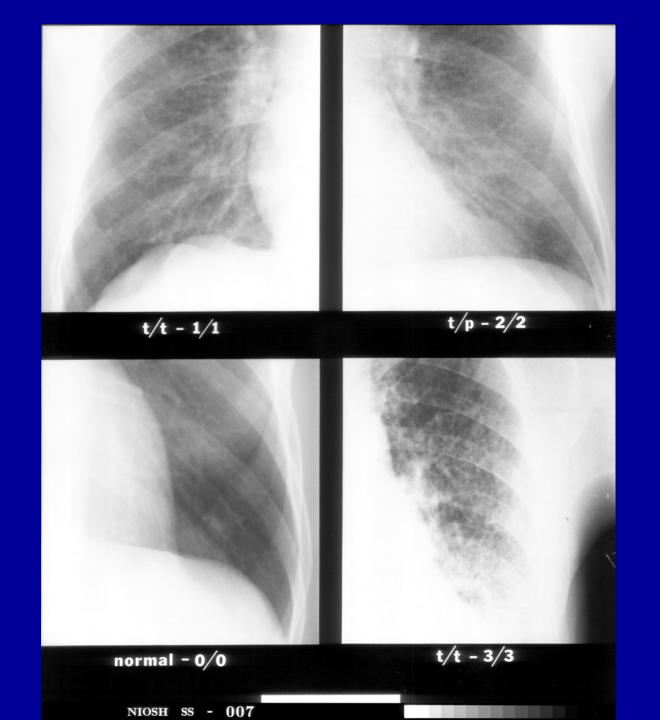
Small opacities:

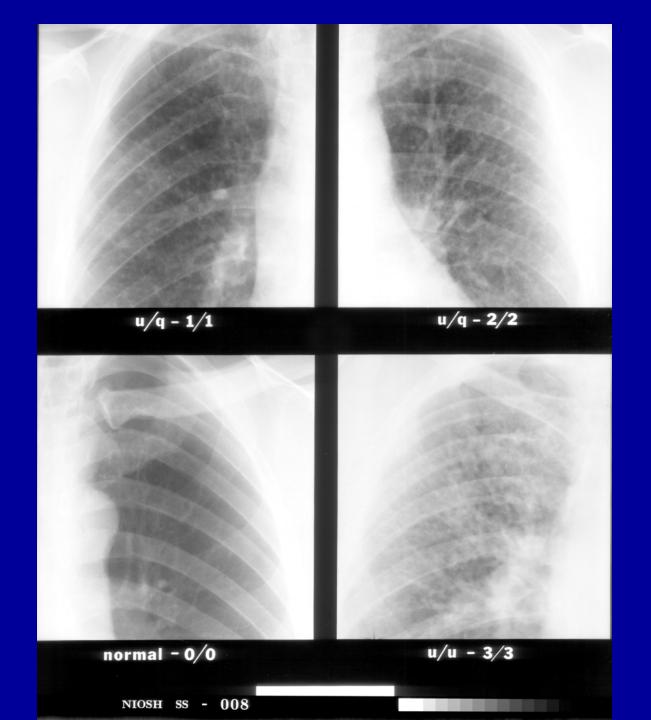
- Rounded: p diameter up to 1.5mm; q 1.5 to 3.0 mm; r >
 3.0mm to 10.0 mm
- Irregular: s diameter up to 1.5mm; t 1.5 to 3.0 mm; u >
 3.0mm to 10.0 mm

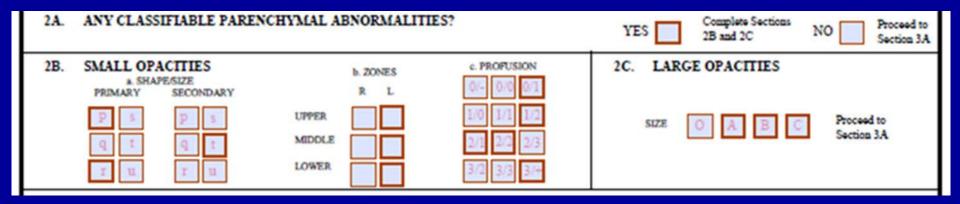
Profusion:

- "Concentration" of small opacities; number per unit of area
- Assessed relative to ILO standard radiographs. 0
 represents no opacities and 3 the highest level of profusion
- Numerator: ILO major category most closely matched
- Denominator: ILO major category next most seriously considered
- Average score for significantly involved lung zones









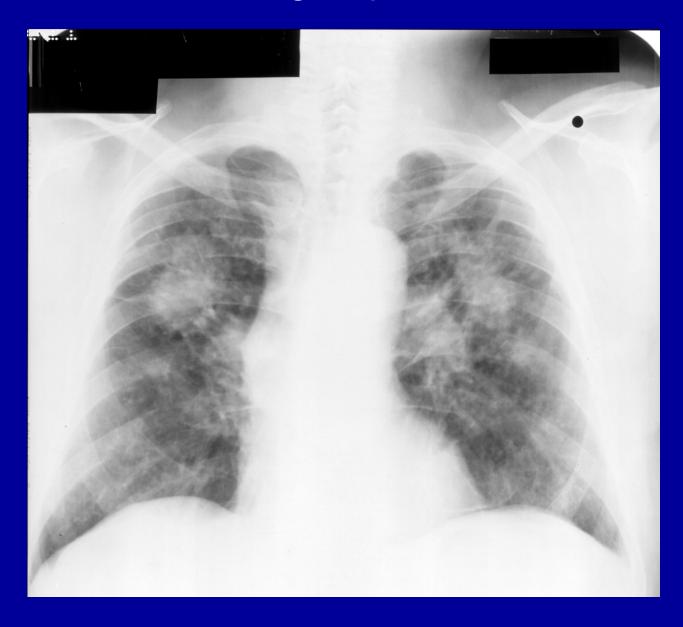
Large Opacities:

- 0 = none
- A = one opacity, greatest diameter > 10 mm and < 50 mm or several opacities each > 10mm but sum of diameters < 50 mm
- B = large opacity, greatest diameter > 50 mm but whose area is not greater than the right upper zone or several large opacities > 50 mm but sum of areas < RUZ.
- C = large opacity whose area exceeds RUZ or several large opacities whose areas when summed exceed the RUZ.

"A" Large Opacity



"B" Large Opacities



"C" Large Opacities



Pleural Abnormalities

3A. ANY CLASSIFIABLE PLET	3A. ANY CLASSIFIABLE PLEURAL ABNORMALITIES?			Sections NO Proceed to Section 4A		
3B. PLEURAL PLAQUES (ma Chest wall In profile Face on ORL Diaphragm ORL Other site(s) ORL	O R L Up to 1/4 1/4 to 1/2	est wall; combined for and face on) of lateral chest wall = 1 of lateral chest wall = 2 of lateral chest wall = 3 L 3 1 2 3	Width (in profile on (3mm minimum wid 3 to 5 mm = a 5 to 10 mm = b > 10 mm = c			
3C. COSTOPHRENIC ANGLE OBLITERATION R Proceed to Section 3D NO Section 4A						
3D. DIFFUSE PLEURAL THICK Site Chest wall In profile O R L Face on O R L	KENING (mark site, calcification, extent, and width) Calcification R L R L	Extent (chest wall; combining for profile and face on) Up to 1/4 of lateral chest to 1/4 to 1/2 of lateral chest to 1/2 of la	(3mm min wall = 1 3 to 5 m wall = 2 5 to 10 m	m = b		

Hyaline Plaque

Calcified Plaque





In Profile and Face On Plaques



Costophrenic Angle Obliteration

Minimal Blunting Not Recorded Substantial Blunting is Recorded



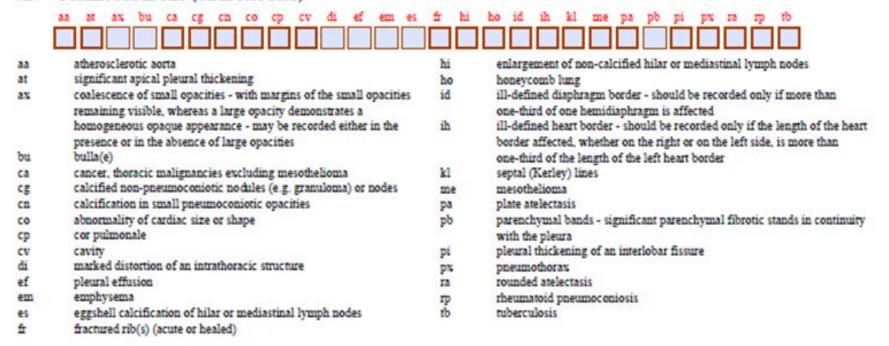


Diffuse Pleural Thickening





4B. OTHER SYMBOLS (OBLIGATORY)



aa atherosclerotic aorta at apical thickening ax coalescence of opacities bu bullae ca cancer cg calcified granuloma or node cn calcified pneumconiotic opacity co abnormal cardiac size or shape cp cor pulmonale cv cavity di distortion intrathoracic organs ef effusion em emphysema es eggshell calcification node fr fractured rib(s)

hi enlarged hilar or mediastinal nodes ho honeycomb lung id ill-defined diaphragm ih ill-defined heart outline kl kerley lines, septal lines me mesothelioma pa plate atelectasis pb parenchymal bands pi pleural thickening intralobar fissure px pneumothorax ra rounded atelectasis rp rheumatoid pneumoconiosis tb tuberculosis (not primary complex) OD other disease (make comment)

4C. MARK	ALL BOXES THAT APPLY: (Use of this list is intend	ded to reduce handwritten comments and is optional)	
☐ Eve ☐ Hiat Airway ☐ Bron ☐ Hyp Bony A ☐ Bon ☐ Frac ☐ Frac ☐ Scol	malities of the Diaphragm entration tal hemia T Disorders nchovascular markings, heavy or increased perinflation Abnormalities ty chest cage abnormality eture, healed (non-rib) eture, not healed (non-rib) liosis tebral column abnormality	Lung Parenchymal Abnormalities Azygos lobe Density, hung Infiltrate Nodule, nodular lesion Miscellaneous Abnormalities Foreign body Post-surgical changes/sternal wire Cyst Vascular Disorders Aorta, anomaly of Vascular abnormality	
	l worker see personal physician because of findings?	Date Physician or Worker notified	i? (mm-dd-yyyy
4E. OTHER	R COMMENTS		

<u>Asbestosis</u>

Film quality: 2 (scapula over lungs)

s/s, 2/3

Fine linear calcifications diaphragms and It heart border (arrowheads)

ho (rt. lower zone), ih, id

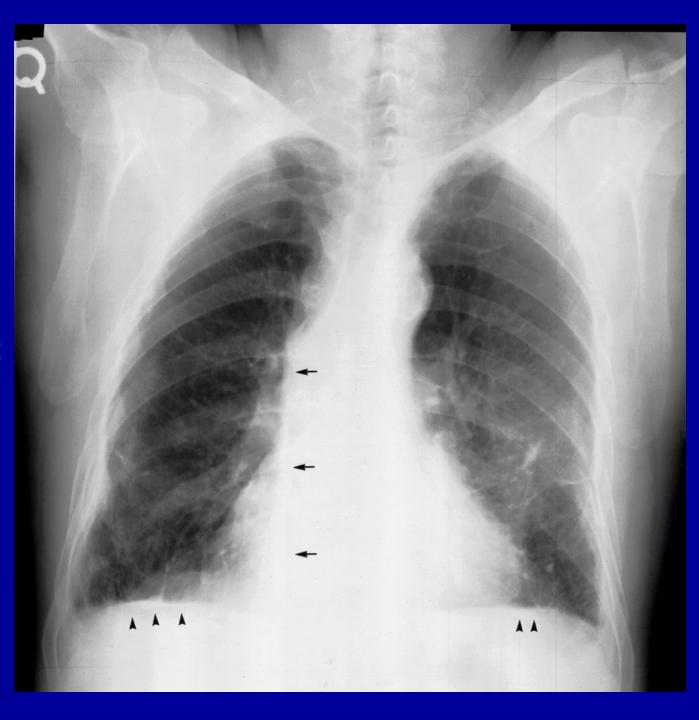


Asbestosis
Film quality: 2
(roller marks)

s/t, 1/2

calcifications
(arrowheads); in
profile plaque (rt);
face on plaque
(lt); costophrenic
blunting (bilat);
diffuse thickening
(lt)

ih, id, co



Coal Worker's Pneumoconiosis

Film quality: 1

q/s, 2/3

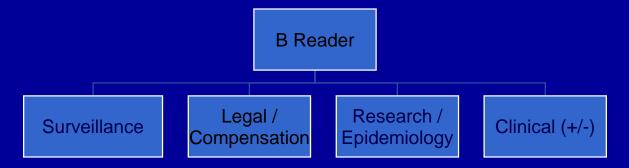
RUZ "A" Large opacity

No pleural abnormalities

ax, tb



Settings for Film Classification by B Readers



- B Readers classify chest radiographs in a variety of settings
- Depending on setting, the following approaches should be considered:
 - choose B-readers in the mainstream of reading tendencies
 - use multiple readers
 - use blinded readers
 - Monitor performance of readers and provide feedback

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