**1. MetaChexNet (2019, Ophir Gozes & Hayit Greenspan)**

* **Method**: Transfer Learning + Meta-learning
* **Technology**: Deep CNN features extracted from CheXNet model (DenseNet-121) trained on ChestX-ray14
* **Model**: CheXNet backbone (DenseNet-121) + Meta-learning approach for adapting to small TB dataset
* **Use case**: Apply large hospital-scale dataset knowledge to TB detection in small dataset

**2. CheXNet (2017, Pranav Rajpurkar et al.)**

* **Method**: Supervised deep learning on chest X-rays
* **Technology**: PyTorch/TensorFlow CNN implementation (DenseNet-121 architecture)
* **Model**: DenseNet-121 with 121 layers, pretrained on ImageNet then fine-tuned on ChestX-ray14
* **Use case**: Multi-label classification of 14 thoracic diseases, radiologist-level pneumonia detection

**3. Multi-Label Classification of Chest X-ray Abnormalities (2023, J. Kufel et al.)**

* **Method**: Multi-label classification + Transfer learning
* **Technology**: CNNs with attention pooling, probabilistic label smoothing, modern augmentation techniques
* **Models**: ResNet-50, EfficientNet variants, Vision Transformers (ViT) explored
* **Use case**: Improve classification accuracy and calibration on multi-label chest disease datasets

**4. ChestNet (2018, Hongyu Wang & Yong Xia)**

* **Method**: Attention-based deep learning
* **Technology**: CNN backbone (ResNet-152) + attention branch
* **Model**: Two branches:
  + **Classification branch** → ResNet-152
  + **Attention branch** → exploits correlation between label and pathology regions
* **Use case**: Thoracic disease classification under weakly supervised setting (no bounding boxes)

**5. Automated Identification of Thoracic Pathology … (2020, DSouza et al.)**

* **Method**: CNN classification + improved training pipeline
* **Technology**: ResNet-34 pretrained on ImageNet, fine-tuned with:
  + SGD with restarts (cosine annealing learning rate schedule)
  + Variable image size training (progressive resizing)
  + Heuristic learning rate finder
* **Model**: ResNet-34 CNN
* **Use case**: Classification of 14 diseases in ChestX-ray14 with improved optimization

**6. Parallel CNN-ELM (2023, Nahiduzzaman et al.)**

* **Method**: Hybrid deep learning (CNN + Extreme Learning Machine)
* **Technology**: Lightweight parallel CNN for feature extraction, ELM for classification
* **Model**: CNN-ELM framework
  + CNN extracts robust deep features
  + Extreme Learning Machine (fast single-layer feedforward neural net with random weights + analytical output weights) for classification
* **Use case**: Classification of **17 lung diseases** (COVID-19, TB, Pneumonia, etc.) with high accuracy, real-time Android deployment