

PITMINER

Supporting clinical research in medical imaging.

PITMINER is a simple but powerful product, designed to meet the needs of medical specialists and researchers by providing fast and accurate interrogation of the reports database.

PITMINER allows the user to perform text based searches against their local clinical report repository via an intuitive user interface. The results are available for review immediately, or can be stored as a user definable project for later use. In addition to free text searches, key attributes, such as modality, sex and age, can be used to filter results to meet research requirements.

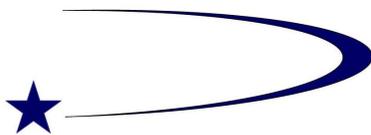
PITMINER allows researchers to harness the rich repository of clinical data, built up over years of diagnostic reporting, without the need to understand the database structure or the use of complex queries.

Search results are presented to allow effective assessment of the report's relevance to the research work.

PITMINER search results are presented with snippets from the report, highlighting the context of where the word was found within the report. The full report can be viewed within the result page for ease of assessment.

Highlights:

- Fast text based searches
- Filter based on modality and other patient or study attributes
- Save results to a project for later review
- Secure access managed through user accounts.
- Report repository is populated through standard HL7 messages.



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The screenshot displays the PITMINER Clinical Search Engine interface. At the top, there are navigation buttons for Search, Projects, Reports, and Exit. Below this is a search criteria section with a table of results. The table has columns for Study Date, Study Description, Modality, Age, Sex, Radiologist, and Summary. Three results are shown, each with a snippet of the report text. The first result is for a CT Abdomen with Contrast on 04 Apr 2009, showing a snippet about arterial calcification. The second and third results are for CT Abdomen on 03 Mar 2010 and 03 Apr 2005, respectively, showing snippets about nephrolithiasis and calcification. Below the table is a 'Report Text' section with a 'Save to Project' button. The report text shows findings for a renal pyramid involving the left kidney, mentioning calcification and nephrolithiasis. At the bottom, it indicates '3 records returned'.

Study Date	Study Description	Modality	Age	Sex	Radiologist	Summary
04 Apr 2009	CT Abdomen with Contrast	CT	60 y	M	Smith, Dr A.	Report: ulatere demonstrates arterial calcification but is otherwise normal in ap...
03 Mar 2010	CT Abdomen	CT	62 y	M	SMITH, J	Report: There is a punctate area of calcification consistent with nephrolithiasis...terior mid hilar region. This calcification measures approximately 4mm in size. There are no additional calcifications of the kidneys. The kidneys ...
03 Apr 2005	CT Abdomen	CT	50 y	M	SMITH, Dr A.	Report: There is a punctate area of calcification consistent with nephrolithiasis...terior mid hilar region. This calcification measures approximately 4mm in size. There are no additional calcifications of the kidneys. The kidneys ...

Report Text

FINDINGS:
There is a punctate area of calcification consistent with nephrolithiasis of a renal pyramid involving the left kidney along the posterior mid hilar region. This calcification measures approximately 4mm in size. There are no additional calcifications of the kidneys. The kidneys are normal in size and contour without evidence of renal parenchymal scarring or decreased nephron population. The right kidney measures 10.9cm while the left kidney measures 11.5cm in size. There are no solid or cystic renal mass lesions. The renal pyramids are normal. There is no hydronephrosis or hydroureter. There is non-opacification of the ureters further indicating no obstructive nephropathy. The perirenal soft tissues are normal and normal perirenal and pararenal soft tissue structures.
The renal vein and renal arteries are normal.
There is a dextroscoliosis of the lumbar spine on this non-weight bearing examination. There is multilevel disc space narrowing and endplate spondylosis consistent with intervertebral osteochondrosis. There is facet arthrosis predominantly involving L3-4, L4-5 and L5-S1 levels with osseous foraminal compromise. Normal liver, spleen, adrenal glands, gallbladder and biliary tree. There is mild pancreatic atrophy. There is no pancreatic mass lesion. There is no retroperitoneal

3 records returned

Detailed search criteria can be easily specified to meet research requirements.

Text Based Searches

PITMINER supports text searches within reports stored in the clinical repository. Searches can be narrowed using terms that need to appear within the report. For example "carcinoma" or "thoracic". Text searches can be defined against:

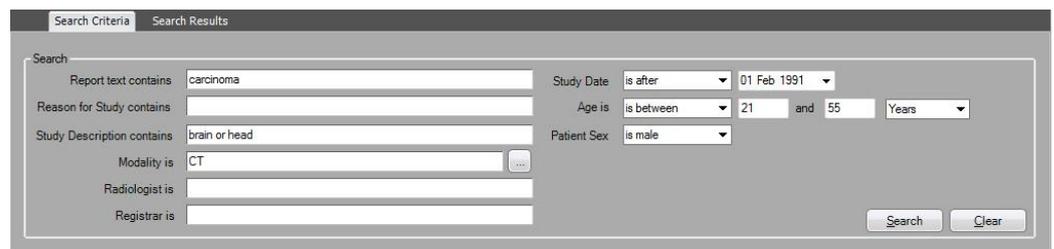
- Report text
- Reason for Study text
- Study Description text

Any combination of these can be used for text searches, and Boolean logic can be applied to perform searches with multiple terms or to exclude terms within the text.

Attribute Searches

Attributes can be used for filtering the reports to be used in the text search. The attributes that can be used for searching are:

- Sex (Male or Female)
- Age (greater than, less than or between)
- Modality (multi-selection)
- Study Date (earlier than, later than or between)



The screenshot shows the 'Search Criteria' tab of the PITMINER interface. It features several input fields and dropdown menus for defining search parameters. The 'Report text contains' field is set to 'carcinoma'. The 'Reason for Study contains' field is empty. The 'Study Description contains' field is set to 'brain or head'. The 'Modality is' field is set to 'CT'. The 'Study Date' dropdown is set to 'is after' with a date of '01 Feb 1991'. The 'Age is' dropdown is set to 'is between' with values '21' and '55' and a unit of 'Years'. The 'Patient Sex' dropdown is set to 'is male'. There are 'Search' and 'Clear' buttons at the bottom right of the form.

PITMINER has aided the research work of radiologists at Royal Brisbane and Women's Hospital.

"We introduced PitMiner as a search engine in early 2010. We have come to use Pitminer as an indispensable tool in our daily radiological life; data searches are no longer being dreaded to be time-consuming and inefficient. I can strongly recommend PitMiner to anybody having to filter large amounts of saved data, be it for audits, research or teaching purposes."

Karin Steinke
Consultant Radiologist RBWH
Associate Professor, University of Queensland – School of Medicine

