

Elsevier Health Sciences

Smart Content Drives Smart Applications

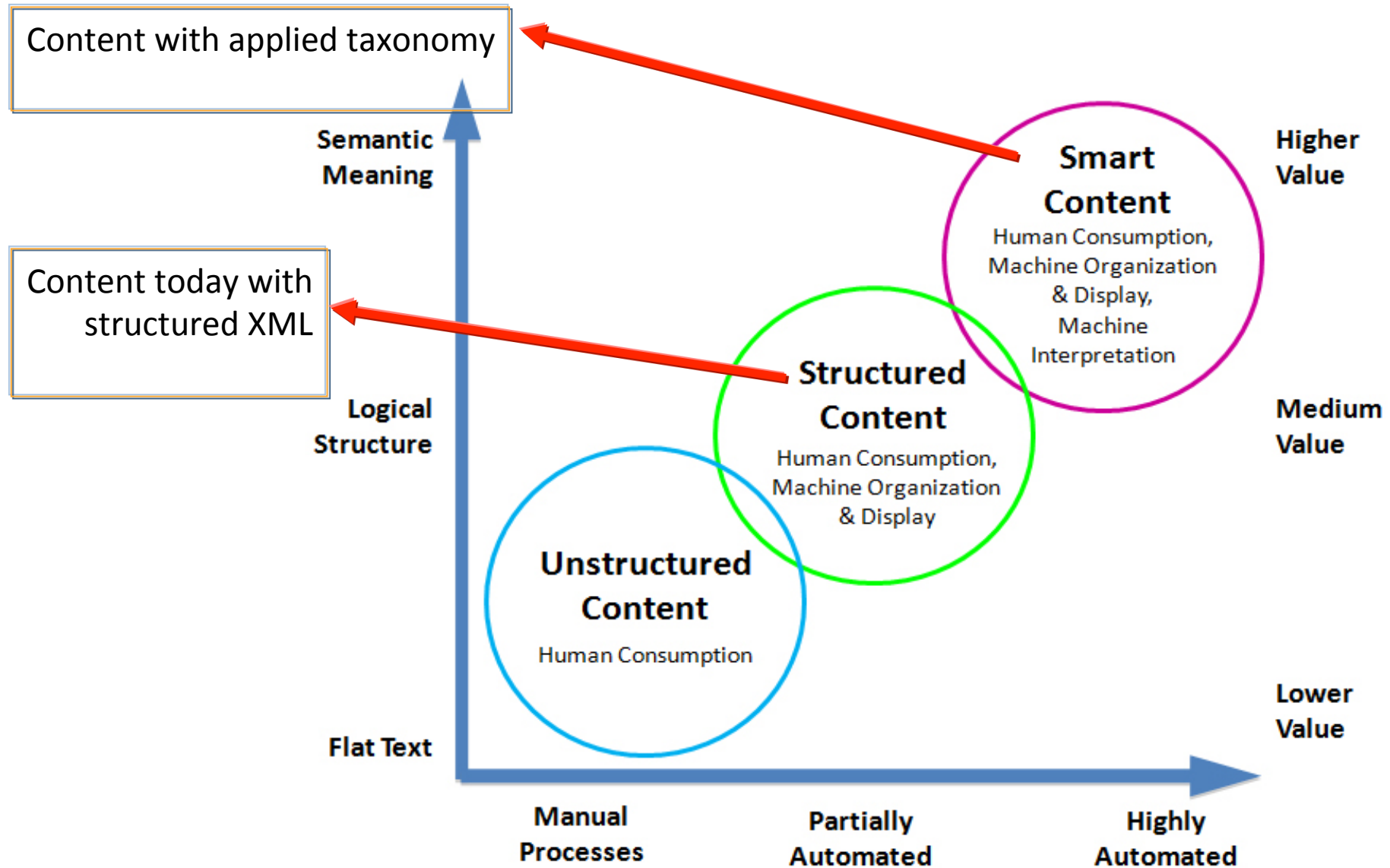
Using Knowledge In Healthcare

Presented to the HCLS Interest Group
May 8, 2012

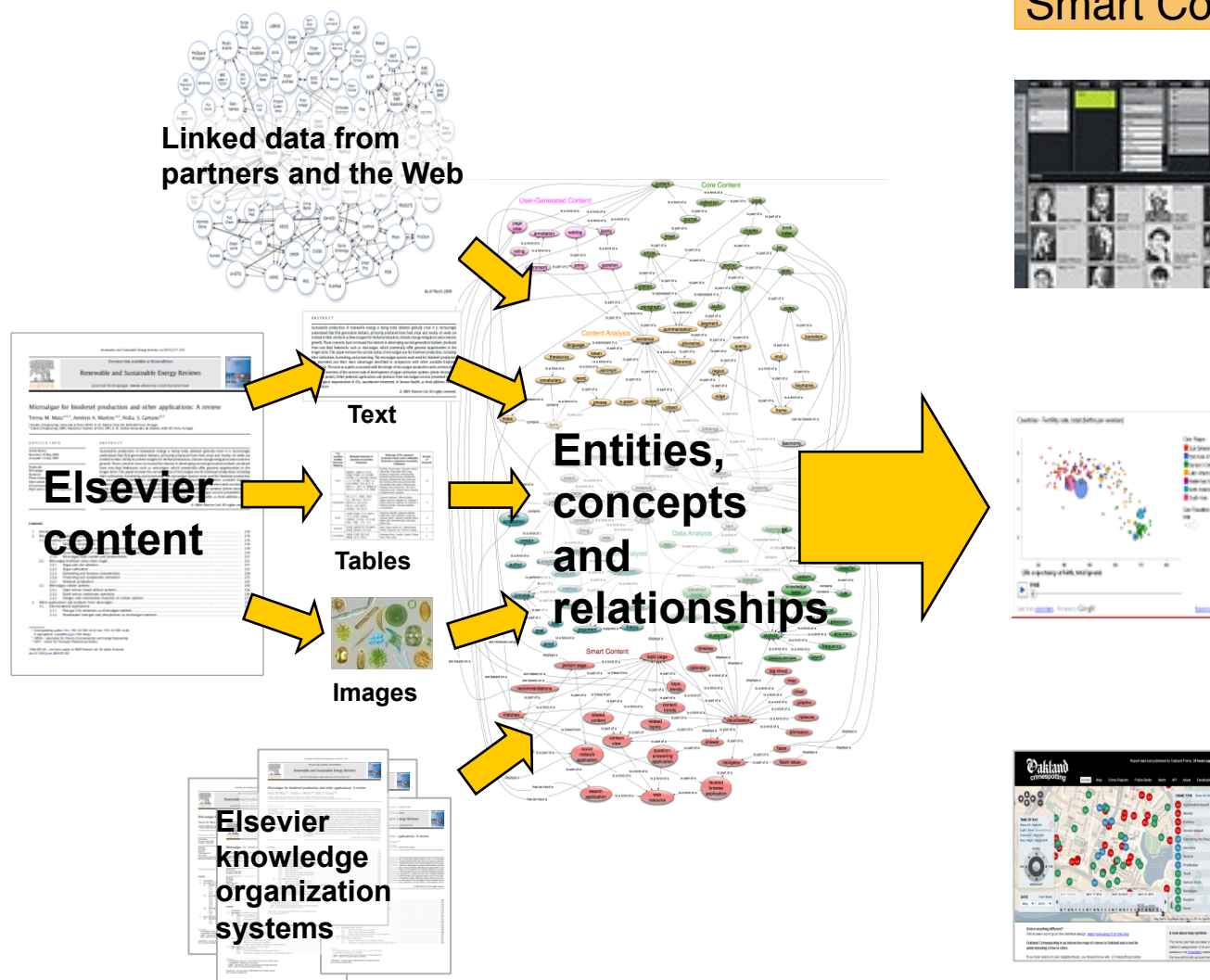
Alan Yagoda
VP, Business Technology
a.yagoda@elsevier.com

Introducing Smart Content

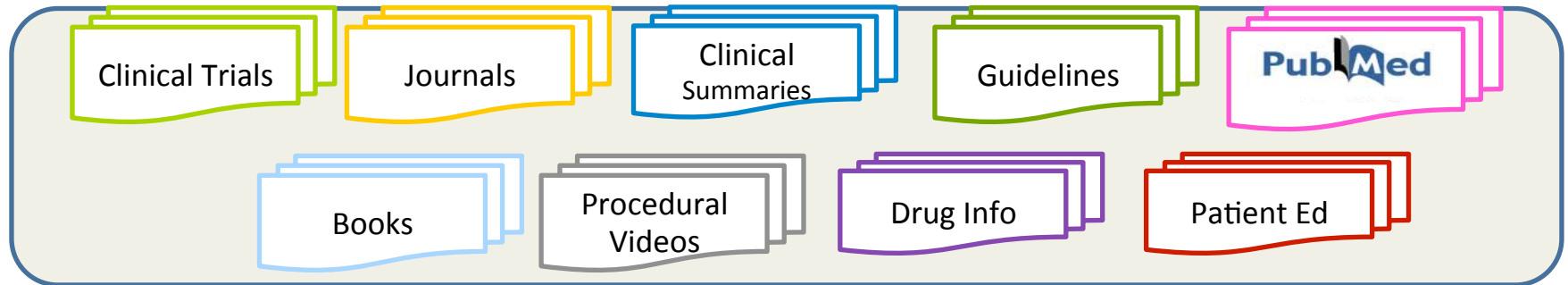
Taxonomy-Powered Content = Smart Content



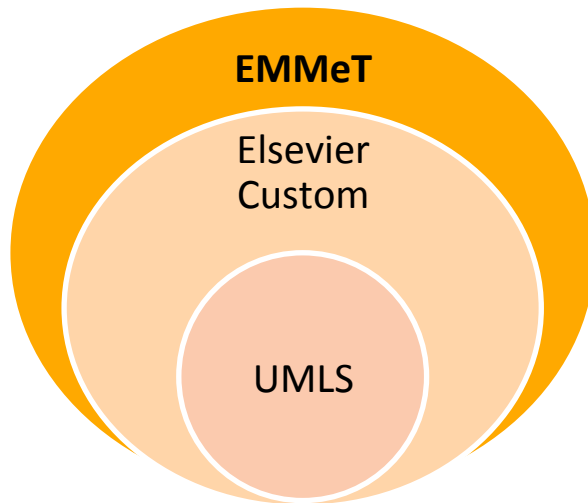
Smart Content Applications



Making Smart Content Work in the Clinical Setting



Elsevier Merged Medical Taxonomy (EMMeT)



Concept Mapping

250K+ Core Clinical Concepts

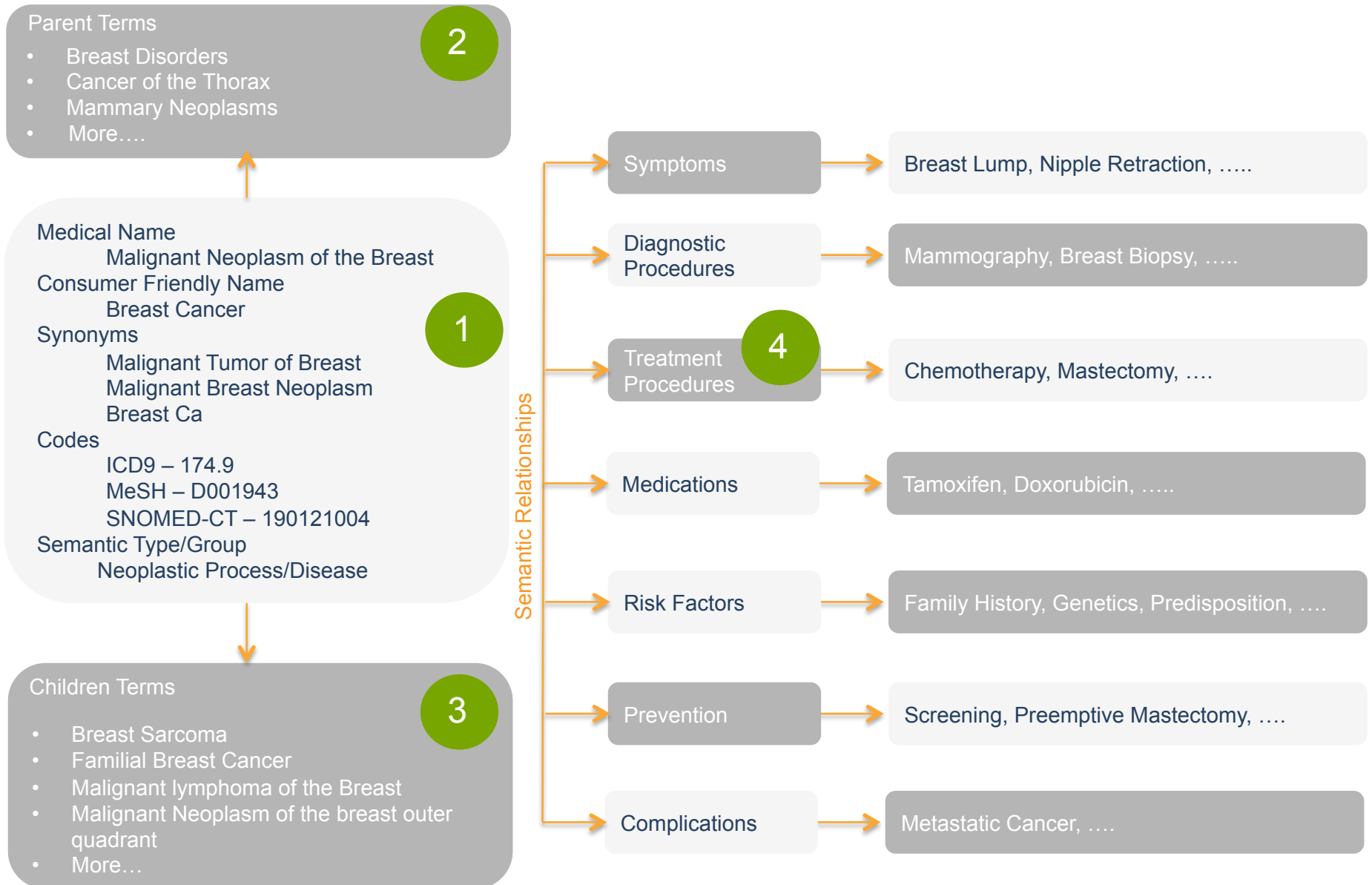
1M+ Synonyms

1M+ Hierarchical Relationships

1M+ Ontological Relationships

- Vast amounts of content made easily discoverable
 - Specialty-specific navigation
 - Dynamic clinical summary creation
 - Meaningful related content recommendations

Introducing EMMeT (Elsevier Merged Medical Taxonomy)



Weighted Tags for Better Search

BNP-Guided vs Symptom-Guided Heart Failure Therapy: The Trial Standard Medical Therapy in Elderly Patients With Congestive Heart Failure (TIME-CHF) Randomized Trial

Pfisterer M, for the TIME-CHF Investigators (Univ Hosp Basel, Switzerland, et al) JAMA 301:383-392, 2009

M.D. Cheitlin

DOI: 10.1016/S0145-4145(09)79633-9 - © 2009 Mosby, Inc. Published by Elsevier Ltd.

PII: S0145-4145(09)79633-9

Optimal use of tests at the time of initial diagnosis and in subsequent monitoring of patients over the course of their disease has not been established. The value of measuring brain natriuretic peptide (BNP) levels in patients with heart failure was tested in 2 randomized trials ([30] and [31]). In the IMPROVE-CHF (Improved Management of Patients With Congestive Heart Failure) study, 500 patients presenting to 1 of 7 emergency departments in Canada were randomized to have NT-proBNP results used to guide management or to be managed conventionally. The patients randomized to NT-proBNP assessment had shorter stays in the emergency department, fewer subsequent rehospitalizations within 60 days, and lower total costs of care ([30]). In the STARS-BNP (Systolic Heart Failure Treatment Supported by BNP) trial, 220 outpatients with stable heart failure were randomized to BNP monitoring with a goal of lowering plasma levels <100 pg/ml or to conventional clinical monitoring ([31]). During the subsequent follow-up, the 110 patients randomized to BNP-guided therapy had significantly more medication adjustments, greater drug doses, and were hospitalized for heart failure at one-half the rate of the conventionally managed patients. Serial assessment of the health status of patients with congestive heart failure also provides information on their subsequent risk of death, as a drop of 5 points in the Kansas City Cardiomyopathy Questionnaire was correlated with a 10% increase in subsequent mortality ([32]).

Mortality	☐
B-type natriuretic peptide	☐
Natriuretic Peptide, Brain	☐
Brain natriuretic peptide measurement	☐
Cardiomyopathy	☐
Chronic heart failure	☐
Congestive heart failure	☐
Drug dose	☐
Heart failure	☐
Monitoring, Physiologic	☐
Questionnaires	☐
Not manually assigned tags	☐

Article-level SMART Content tags help confirm relevance and provide a topical overview about a piece of content.

Filter tags: show all | [compound](#) | [disease](#) | [technique](#)

B-type natriuretic peptide	☐
Natriuretic Peptide, Brain	☐
Chronic heart failure	☐
Congestive heart failure	☐
Heart failure	☐
Hospitalism	☐
Universal	☐
Hospitalization	☐
Confidence Intervals	☐
Pro-brain natriuretic peptide (1-76)	☐
Brain natriuretic peptide measurement	☐
Coronary Artery Disease	☐
Multicenter Studies as Topic	☐
Primary cardiomyopathy	☐
Questionnaires	☐
Survival Rate	☐
Systolic heart failure	☐

Paragraph-level SMART Content tags uncover highly-relevant information not necessarily evident from the title or abstract alone.

Review Article

The Year in Epidemiology, Health Services Research, and Outcomes Research

Mark A. Hlatky, Paul A. Heidenreich

DOI: 10.1016/j.jacc.2009.01.038 - © 2009 American College of Cardiology Foundation Published by Elsevier Ltd.

PII: S0735-1097(09)00404-5

Search & Discovery: ClinicalKey

EMMeT Powered Auto-Suggest

Journals Books Practice Guidelines Patient Education Drugs Multimedia

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CLINICAL **KEY**
beta

ELSEVIER

Smarter search. Faster answers.

tricuspid regurgitation

Search

- DISEASE** ▶ Tricuspid Valve Insufficiency
- DISEASE** ▶ Functional tricuspid regurgitation (disorder)
- FINDINGS** ▶ Peak velocity of tricuspid regurgitation (observable entity)
- FINDINGS** ▶ Tricuspid Valve Insufficiency Risk Factors
- DISEASE** ▶ Congenital insufficiency of tricuspid valve (disorder)
- DISEASE** ▶ Rheumatic tricuspid valve regurgitation (disorder)
- DISEASE** ▶ Rheumatic tricuspid stenosis and insufficiency (disorder)
- DISEASE** ▶ Transient tricuspid regurgitation of newborn (disorder)
- DISEASE** ▶ Tricuspid incompetence, non-rheumatic (disorder)

You may also be interested in:

- PROCEDURE** ▶ Echocardiography
- PROCEDURE** ▶ Electrocardiography
- PROCEDURE** ▶ Transesophageal Echocardiography
- PROCEDURE** ▶ Radiography of chest
- PROCEDURE** ▶ Annuloplasty of Tricuspid Valve
- PROCEDURE** ▶ History AND physical examination
- PROCEDURE** ▶ Repair of Tricuspid Valve with Prosthesis

Speed to Answer: Most relevant preview

JournalsBooksPractice GuidelinesPatient EducationDrugsMultimedia

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CLINICAL KEYbetaELSEVIER

tricuspid regurgitation

Search

...is your feedback.
Tell Us What You Think!

Saved Searches+

Time: (All)

Sort By: (Relevance)

Reading List+Presentation+

Page 1 of 887

Displaying results 1 to 10 of 8869

Show 10 items

Content Type

All

MEDLINE (3826)

Journals (2201)

Images (1609)

Books (1125)

Videos (51)

Clinical Trial (30)

Guidelines (14)

First Consult (9)

Procedures Consult (6)

Specialty

All

Cardiovascular Disease (2343)

Thoracic Surgery (955)

Anesthesiology (314)

Surgery (240)

Radiology (189)

Critical Care Medicine (113)

Transplantation (111)

Internal Medicine (98)

Pediatrics (87)

OB/GYN (68)

Key Results for tricuspid regurgitation

M

Pathophysiology of tricuspid regurgitation: quantitative Doppler echocardiographic assessment of respiratory dependence. [MEDLINE]

Topilsky, Yan,Tribouilloy, Christophe,Michelena, Hector I,Pislaru, Sorin,Mahoney, Douglas W,Enriquez-Sarano, Maurice

Circulation, 2010-10-12, - 1505-13

Respiratory dependence of tricuspid regurgitation (TR), a long-held concept suggested by murmur variation, remains unproven and of unclear mechanisms. In 41 patients with mild or greater Tricuspid Valve Insufficiency (median age, 67 years), we per...

J

Tricuspid Regurgitation in Mitral Valve Disease [Journal]

Shiran, Avinoam, MD,Sagie, Alex, MD

Journal of the American College of Cardiology, 2009-02-03, Volume 53, Issue 5, 401-408

A 74-year-old man is admitted to the hospital for the treatment of exacerbation of congestive heart failure from which he has suffered for the last 2 years. He has rheumatic heart disease and had mitral valve replacement (MVR) with a mechanical bi...

M

Risk factors and mortality associated with an elevated tricuspid regurgitant jet velocity measured by Doppler-echocardiography in thalassemia: a Thalassemia Clinical Research Network report. [MEDLINE]

Morris, Claudia R,Kim, Hae-Young,Trachtenberg, Felicia,Wood, John,Quinn, Charles T,Sweetters, Nancy,Kwiatkowski, Janet L,Thompson, Alexis A,Giardina, Patricia J,Boudreaux, Jeanne,Olivier, Nancy F,Porter, John B,Neufeld, Ellis J,Vichinsky, Elliott P,null, null

Blood, 2011-10-06, - 3794-802

An elevated tricuspid regurgitant jet velocity (TRV) is associated with hemolysis and early mortality in sickle cell disease, yet risk factors, clinical parameters, and mortality associated with this biomarker in thalassemia are poorly defined. Th...

M

Combining tricuspid valve repair with double lung transplantation in patients with severe pulmonary hypertension, tricuspid

Content Preview

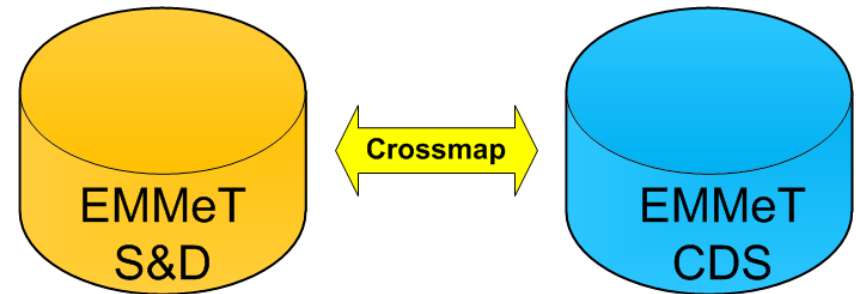
Search Term 1 of 29

A 74-year-old man is admitted to the hospital for the treatment of exacerbation of congestive heart failure from which he has suffered for the last 2 years. He has rheumatic heart disease and had mitral valve replacement (MVR) with a mechanical bileaflet prosthetic valve for predominantly mitral regurgitation (MR) 12 years before his admission. At that time he had good left ventricular (LV) contraction, his pulmonary artery pressure was 32/16 mm Hg, and he had no clinical tricuspid regurgitation (TR). He is in chronic atrial fibrillation (AF), his neck veins are distended with prominent V waves, and he has an enlarged pulsating liver and severe peripheral edema. Echocardiography reveals a normally functioning prosthetic mitral valve (MV), good LV contraction, and no aortic valve disease. The right ventricle (RV) and right atrium are dilated and RV function is reduced. The tricuspid valve (TV) leaflets appear normal, but the tricuspid annulus (TA) is dilated and measures 4.5 cm, and there is severe malcoaptation of the TV leaflets and severe TR (, Online Videos 1 and 2).

Clinical Decision Support

Creation of CDS-specific instance of EMMeT

- Complete set of selected UMLS crosswalks
- Complete set of validated vocabulary relationships between diagnoses complaints, observations symptoms, diagnoses, and treatments
- Maps to EMMeT Search & Discovery (S&D) for access to custom terminology
- Used for medical coding



Curated Slice of Select Vocab

- Mapped to UMLS, including: SNOMED; ICD9; RxNORM; MeSH
- Custom terminology w/ robust jargon (acronyms, synonyms, etc.)
- Focus on linguistics for Search & Discovery

Complete Vocab Mapped

- ICD9 to ICD10
- ICD 10 SNOMED
- ICD9 to SNOMED
- CPT to SNOMED
- Access to EMMeT full concepts including custom terms via crossmaps

Linked Data Repository

Evaluation and management of delirium in hospitalized older patients

Delirium is common in hospitalized older patients and may be a symptom of a medical emergency, such as hypoglycemia. It is characterized by an acute change in cognition and attention, although the symptoms may be subtle and fluctuate throughout the day. This heterogeneous condition requires prompt recognition and evaluation, because the underlying medical condition may be life threatening. Risk factors for delirium include visual impairment, previous cognitive impairment, severe illness, and an elevated blood urea nitrogen/serum creatinine ratio. Interventions that have been shown to reduce the incidence of delirium in at-risk hospitalized patients include reorientation of the patient to person and place, promotion of good sleep hygiene, early mobilization, correction of dehydration, and the minimization of unnecessary noise and stimuli. The treatment of delirium centers on the recognition and management of the medical condition that triggered the delirious state. Nonpharmacologic interventions may be beneficial, but antipsychotic agents may be needed when the cause is nonspecific and other interventions do not sufficiently control symptoms such as severe agitation or psychosis. If delirium is a temporary condition, it may last for several months in the most vulnerable patients. Patient outcomes at one year include a higher mortality rate and a lower level of functioning compared with age-matched control patients. Copyright © 2008 American Academy of Family Physicians.

Title

Disease

Clinical finding

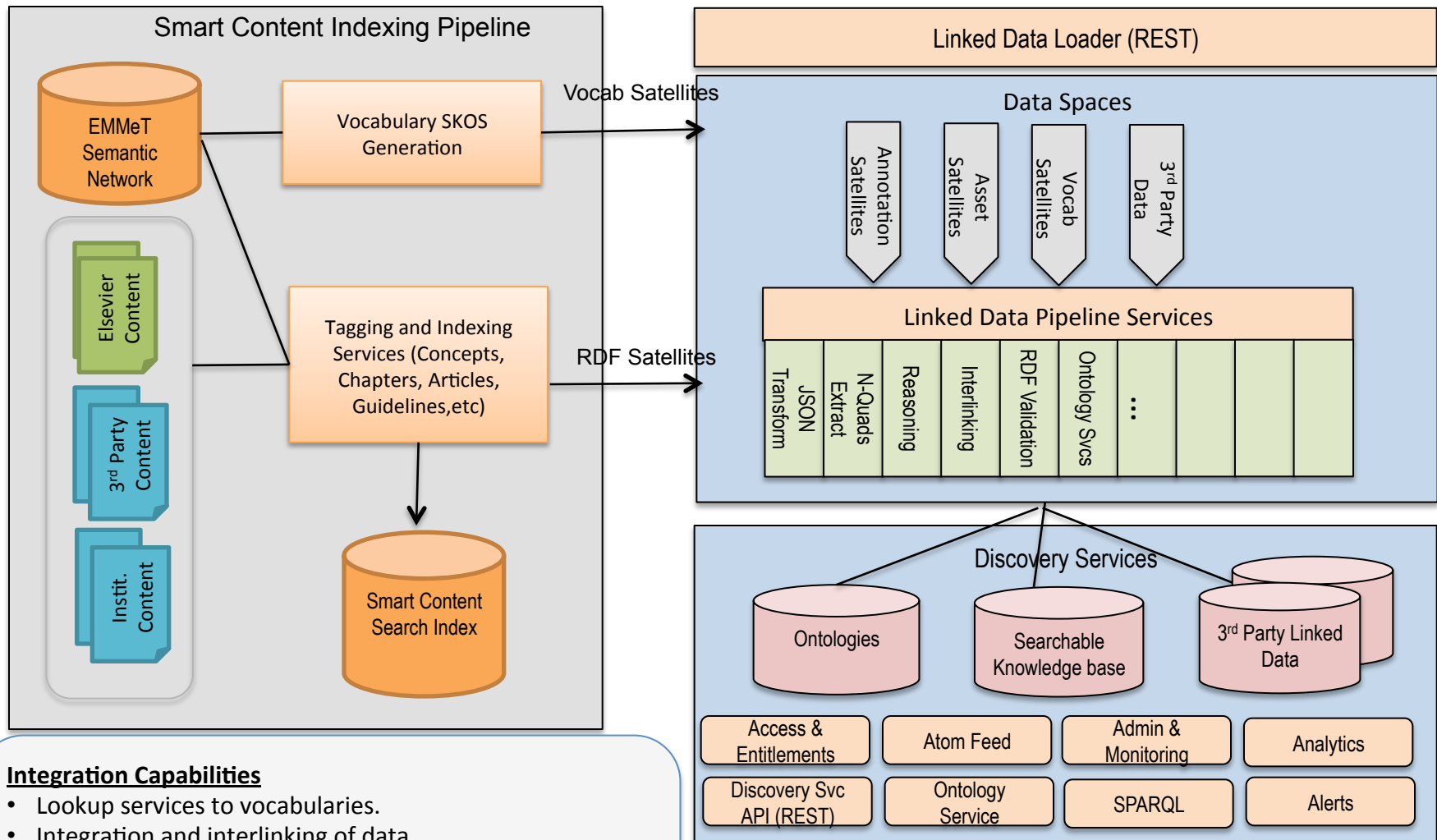
Drugs

Source

What is the LDR?

- Service that provides a rich semantic layer on top of content and enables search and discovery of metadata.
- Transforms content into data to allow exploration of knowledge base
- Opens up discovery of content beyond searchable documents
- Interlinks data with other related sources of content
- Optimized for high-volume read-write of RDF data
- Provide service layer APIs for ease of integration

LDR Integration Capabilities



Integration Capabilities

- Lookup services to vocabularies.
- Integration and interlinking of data.
- Semantic search and discovery of smart content data
- Easier access and discovery of content from 3rd party systems such as EMR platforms.
- Provide bridge for easier cross-product integration.

Linked Data Repository Demo Applications

LDR Showcase for Elsevier Health Sciences: API Search



Elsevier Linked Data Repository

Home - Anatomy - Clinical Findings - Diseases - Drugs - Organisms - Procedures - Geography - Study Characteristics

Jump to Topic Page:

Outline:

- [Description](#)
- [Authors](#)
- [Affiliations](#)
- [Concepts](#)
- [Metadata](#)

Links:

- [RDF Satellite](#)
- [View Article](#)

Night-time nasal ventilation in neuromuscular disease

Description

14 patients, aged 2-28 years, with neuromuscular disorders and symptomatic sleep hypoventilation received night-time intermittent positive-pressure ventilation with a nasal mask. 9 were treated de novo and 5 had previously been maintained on a cuirass or iron lung. Nasal ventilation was very effective in 10 patients but was not tolerated in 4 of the 5 youngest patients. Nasal ventilation was preferable to other methods of ventilation because the system was non-invasive, quiet, portable, and easy to use and because it allowed considerable independence.

Authors

- [Heckmatt, J. Z.](#)
- [Dubowitz, V.](#)
- [Loh, L.](#)

Affiliations

- [Hammersmith Hospital](#)
- [Radcliffe Infirmary](#)

Concepts associated with this article

	Score (for article)	Matches (in LDR)	RDF
DISEASE Benign fasciculation-cramp syndrome	0.825	363	↗
DISEASE Disorder of the nose	0.746	2751	↗
PROCEDURE Masks	0.684	1582	↗
DISEASE Benign fasciculation-cramp syndrome	0.605	363	↗
DISEASE Sleep hypoventilation	0.566	13	↗
PROCEDURE Intermittent Positive-Pressure Ventilation	0.526	188	↗
DRUG Iron	0.526	9328	↗
ANATOMY Lung	0.526	22646	↗
PROCEDURE Mechanical Ventilators	0.473	2576	↗
FINDING Feeling relief	0.276	18985	↗
PROCEDURE Sleep	0.236	9479	↗
PROCEDURE Vital Capacity	0.197	1042	↗

Integrating EMR Patient Data with Evidence-Based Research

The screenshot displays the SimChart EMR interface. At the top, a patient profile for 'C, A' is shown with fields for Sex (M), Weight, Code Status (0 0), Isolation (0 0), Food Allergies (NKA), and Diet (0 0). The 'Medical Record Number', 'Room Number', and 'Health Care Provider' (A Rob) are also visible. A 'welcome sunderFN LNsundar' message and 'Submit'/'Logout' buttons are in the top right.

A 'Linked Content' window is open, displaying search results for 'Drugs'. The window has a sidebar with a list of categories: Overview, First Consult, Biology, Diagnosis, Treatment, Progress, Prevention, **Drugs** (highlighted), Clinical Finding, Disease, Procedure, Guidelines, Patient Handouts, and Multimedia. The main area shows 'Showing 1 to 5 of 10 Results' with 'Prev' and 'Next' links.

The search results are as follows:

Drug	Search Results
Peptide Hydrolases <u>α1-antitrypsin deficiency</u>	P S G H (Smoker) Lancet, Volume 365, Issue 9478, 2005
Cotinine <u>Plasma cotinine, smoking, and lung cancer in China</u>	P S G H (Smoker) The Lancet, Volume 335, Issue 8699, 1990
Tobacco Smoke Pollution <u>PASSIVE SMOKING AND LUNG CANCER</u>	P S G H (Smoker) The Lancet, Volume 322, Issue 8350, 1983
Dust <u>CHRONIC RESPIRATORY DISEASE IN A RURAL COMMUNITY</u>	P S G H (Smoker) The Lancet, Volume 292, Issue 7569, 1968
Leukocyte Elastase <u>α1-antitrypsin deficiency</u>	P S G H (Smoker) Lancet, Volume 365, Issue 9478, 2005

Each result includes a pill icon, a 'Preview' link, and a 'More ..' link. Below the search results, there are sections for 'No Data Entered' and 'Drains/Tubes:'. The bottom of the interface shows 'No Data Entered' and 'Drains/Tubes:'.

Linking Elsevier Gold Standard Drug Data to LOD Data



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Example Queries

[Q1. Which genetic variants can influence warfarin treatment?](#)

[Q2. Which variant can influence someone suffering asthma?](#)

[Q3. Which variant can influence someone suffering diabetes?](#)

[Q4. Can any variant cause a myocardial infarction in a patient taking pravastatin?](#)

LDR Drug Information Demo

SELECT THE DRUG

[Retrieve Info](#)

Information Retrieved From **Gold Standard** Data Base

• **Product Name:** Ablify 10mg Tablet

Aripiprazole was the first in a new class of atypical antipsychotic drugs known as 'dopamine system stabilizers' (DSSs). Aripiprazole is a partial dopamine agonist, in contrast to other antipsychotic agents that are full dopamine antagonists, and, thus, the drug has a distinct mechanism of action. Atypical antipsychotics are the standard of care for schizophrenia and related disorders, and with the exception of clozapine, are first-line treatment options for the management of psychosis. Compared to traditional antipsychotics, aripiprazole has a very low incidence of cardiovascular reactions; it does not lengthen the QT interval. It has not been found to affect prolactin. Both negative and cognitive symptoms of schizophrenia are reduced by aripiprazole and motor side effects appear to be less of a problem than with other antipsychotics. Aripiprazole's overall efficacy in schizophrenia appears similar to haloperidol and risperidone.[30095] In the monotherapy



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Example Queries

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LDR Drug Information Demo

Information Retrieved From **SIDER** Data Base

- Side Effect: [sarcoidosis](#)
- Side Effect: [Schizophrenia](#)
- Side Effect: [Seizures](#)
- Side Effect: [cerebrovascular accident](#)
- Side Effect: [Thrombocytopenia](#)
- Side Effect: [arthritis](#)
- Side Effect: [ASTHMA](#)
- Side Effect: [ataxia](#)
- Side Effect: [ventricular tachycardia](#)

[Obtain More Info....](#)

Information Retrieved From **Diseasome** Data Base

Disease - Source:Diseasome	Associated Gene - Source: OMIM	Chromosomal Location
Congestive heart failure, susceptibility to	ADRB1	10q24-q26
Congestive heart failure, susceptibility to	ADRB1R	10q24-q26
Congestive heart failure, susceptibility to	RHR	10q24-q26
Resting heart rate, 607276	ADRB1	10q24-q26
Resting heart rate, 607276	ADRB1R	10q24-q26
Resting heart rate, 607276	RHR	10q24-q26
Alcohol dependence, susceptibility to, 103780	HTR2A	13q14-q21
Anorexia nervosa, susceptibility to, 606788	HTR2A	13q14-q21
Obsessive-compulsive disorder, susceptibility to, 164230	HTR2A	13q14-q21
Schizophrenia, susceptibility to, 181500	HTR2A	13q14-q21
Seasonal affective disorder, susceptibility to, 608516	HTR2A	13q14-q21
Dystonia, myoclonic, 159900	DRD2	11q23

Information Retrieved From **ClinicalTrials** Data Base