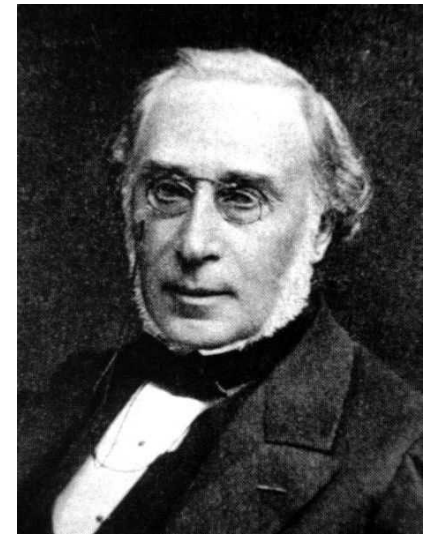


Som man råber i skoven....

- om kunsten at finde det hele



Bacteremia terminology



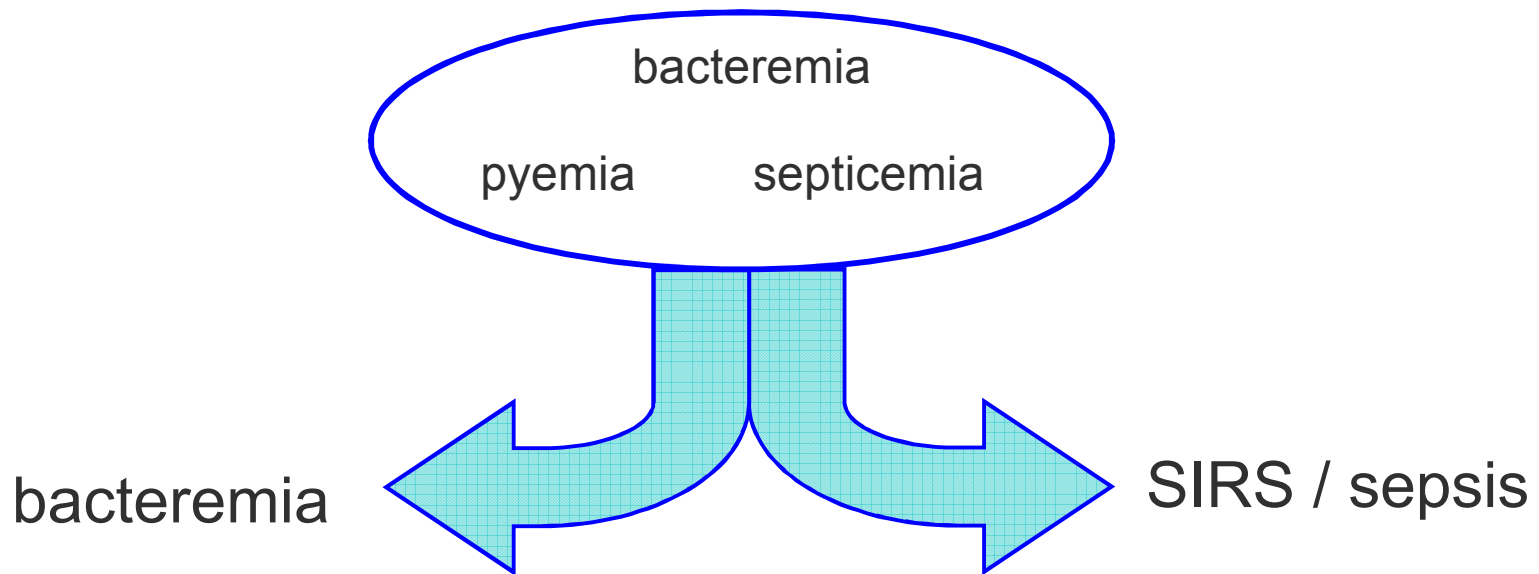
Casimir-Joseph Davaine
(1812-1882)

1823: Blood from animals with **anthrax** is contagious.

1850: **Casimir-Joseph Davaine** observed bacteria in blood from animals with anthrax.

1872: The term **bacteremia** was coined to emphasize the pathogenic role of the phrase 'bacteria in the blood'.

- **Bacteremia** encompasses fungemia, because these two kingdoms were not distinguished at that time
- Other contemporary terms were **pyemia** and **septicemia**



Bacteremia terminology: Septicemia

Septicemia has been defined in the past as the presence of microorganisms or their toxins in the blood. However, this term has been used clinically and in the medical literature in a variety of ways, which has added to confusion and difficulties in data interpretation. Septicemia also does not adequately describe the entire spectrum of pathogenic organisms that may infect the blood. We therefore suggest that this term be eliminated from current usage.

ACCP/SCCM Consensus Conference
Chest 1992; 101: 1644

- McBean et al. Increasing rates of hospitalization due to septicemia in the US elderly population, 1986-1997. *J Infect Dis* **2001**
- Baine et al. The epidemiology of hospitalization of elderly americans for septicemia or bacteremia in 1991-1998: Application of Medicare claims data. *Ann Epidemiol* **2001**

Bacteremia terminology: Bloodstream infection

- Frequently used alternative to bacteremia
- Especially since 1980' with increasing attention to nosocomial infections
- Currently not an entry term to bacteremia
- Queries that use only bacteremia may not detect all relevant articles

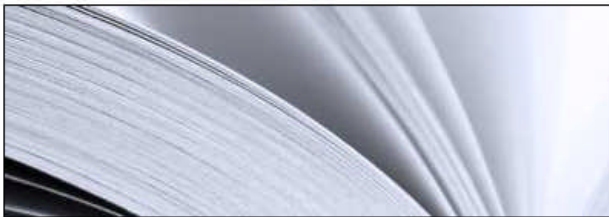
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What are MeSH?

- MeSH are medical subject headings
- NLM indexers choose and attach 10-12 MeSH terms representing the concepts of the article
- 25,588 descriptors in 2010 MeSH
- Synonyms, near-synonyms and closely related concepts are included as entry terms
- >172,000 entry terms

MeSH Descriptor Data: Bacteremia

MeSH Heading	Bacteremia
Tree Number	C01.252.100
Tree Number	C01.539.757.100
Tree Number	C23.550.470.790.500.100
Annotation	coord with specific bact/infect heading or specific bacterium if specific bact infect is not in MeSH (do not use / blood to indicate -emia)
Scope Note	The presence of viable bacteria circulating in the blood. Fever, chills, tachycardia, and tachypnea are common acute manifestations of bacteremia. The majority of cases are seen in already hospitalized patients, most of whom have underlying diseases or procedures which render their bloodstreams susceptible to invasion.
See Also	Endotoxemia
Allowable Qualifiers	BL CF CI CL CN CO DH DI DT EC EH EM EN EP ET GE HI IM ME MI MO NU PA PC PP PS PX RA RH RI RT SU TH TM UR US VE VI
Previous Indexing	Septicemia (1966-1991)
Previous Indexing	specific bacterial infection (1966-1991)
Online Note	use SEPTICEMIA to search BACTEREMIA 1975-91
History Note	92; was see SEPTICEMIA 1975-91
Date of Entry	19910102
Unique ID	D016470



MeSH Descriptor Data: Bacteremia

MeSH Heading	Sepsis
Tree Number	C01.539.757
Tree Number	C23.550.470.790.500
Annotation	SEPSIS SYNDROME see SYSTEMIC INFLAMMATORY RESPONSE SYNDROME is also available
Scope Note	Systemic inflammatory response syndrome with a proven or suspected infectious etiology. When sepsis is associated with organ dysfunction distant from the site of infection, it is called severe sepsis. When sepsis is accompanied by HYPOTENSION despite adequate fluid infusion, it is called SEPTIC SHOCK .
Entry Term	Blood Poisoning
Entry Term	Poisoning, Blood
Entry Term	Pyaemia
Entry Term	Pyemia
Entry Term	Pyohemia
Entry Term	Septicemia
Entry Term	Severe Sepsis
Allowable Qualifiers	BL CF CI CL CN CO DH DI DT EC EH EM EN EP ET GE HI IM ME MI MO NU PA PC PP PS PX RA RH RI RT SU TH TM UR US VE VI
Previous Indexing	Septicemia (1966-1994)
Previous Indexing	specific infection (1966-1994)
History Note	1995
Date of Entry	19940523
Unique ID	D018805



Restrict Search to Major Topic headings only.

Do Not Explode this term (i.e., do not include MeSH terms found below this term in the MeSH tree).

Entry Terms:

- Pyemia
- Pyemias
- Pyohemia
- Pyohemias
- Pyaemia
- Pyaemias
- Septicemia
- Septicemias
- Poisoning, Blood
- Blood Poisoning
- Blood Poisonings
- Poisonings, Blood
- Severe Sepsis
- Sepsis, Severe

Previous Indexing:

- [Septicemia \(1966-1994\)](#)
- [specific infection \(1966-1994\)](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Bacterial Infections and Mycoses](#)

[Infection](#)

Sepsis

[Bacteremia](#)

[Endotoxemia](#)

[Hemorrhagic Septicemia](#)

[Fungemia](#)

[Shock, Septic](#)



NATIONAL INSTITUTES OF HEALTH

MEDICAL
SUBJECT HEADINGS—
TREE
STRUCTURES

2002

Septicemia

CI.539.757.720+

a type of sepsis; GEN or unspecified only: prefer BACTEREMIA; FUNGEMIA; PARASITEMIA or VIREMIA; HEMORRHAGIC BACTEREMIA, a Pasteurella infect, is also available

see related

Endotoxemia

X Blood Poisoning

Sepsis

CI.539.757+

a type of infect; do not confuse with SEPTICEMIA; SEPSIS SYNDROME is also available

95

Aim

- To demonstrate that the inconsistent terminology can cause problems for health experts trying to obtain relevant information

Methods

- PubMed/MEDLINE – 1966 to 2009
- Queries:
 - Bacteremia
 - Bloodstream infection – free text
 - Bloodstream infection – phrase
 - Septicemia
- Extracted MeSH terms from the retrieved records and compared topic similarity

Stopwords

- Adolescent
- Adult
- Afghanistan
- Africa
- Africa, Eastern
- Africa, Western
- Aged
- Aged, 80 and over
- Alabama
- Alaska
- Alberta
- Algeria
- Animals
- Animals, Newborn
- Animals, Wild
- Animals, Zoo
- Argentina
- Arizona
- Asia
- Asia, Southeastern
- Australia
- Austria
- Baltimore
- Bangladesh
- Bass
- Belgium
- Berlin
- Birds
- Switzerland
- Taiwan
- Tennessee
- Texas
- Thailand
- Togo
- Trout
- Chile
- China
- Cluster Analysis
- Cohort Studies
- Colombia
- Colorado
- Connecticut
- Cote d'Ivoire
- Croatia
- Cuba
- Czech Republic
- Democratic Republic of the Congo
- Denmark
- dogs
- Ecuador
- Eels
- Egypt
- England
- Europe
- Female
- Finland
- Fishes
- Pigs
- Slovakia
- South Africa
- spain
- Sri Lanka
- Sudan
- Tunisia
- Malawi
- Malaysia
- Male
- Massachusetts
- Mice
- Mice, Hairless
- Mice, Inbred BALB C
- Mice, Inbred C3H
- Mice, Inbred C57BL
- Mice, Inbred CBA
- Mice, Inbred ICR
- Mice, Inbred Strains
- Mice, Knockout
- Mice, Mutant Strains
- Mice, Nude
- Mice, Obese
- Mice, SCID
- Mice, Transgenic
- Michigan
- Middle Aged
- Hawaii
- Hong Kong
- Horses
- Humans
- Hungary
- Illinois
- India
- Indiana
- Indonesia
- Infant
- Infant, Newborn
- Infant, Premature
- Insects
- Pakistan
- Papua New Guinea
- Paris
- Pennsylvania
- Peru
- Philippines
- Poland
- Population Surveillance
- Portugal
- Prospective Studies
- Quebec
- Queensland
- rats
- Rats, Inbred F344
- Rats, Inbred Lew
- Rats, Inbred Strains
- Rats, Sprague-Dawley
- rats, wistar
- Retrospective Studies
- Rhode Island
- Rome
- Rwanda
- San Francisco
- Saudi Arabia
- Scotland
- Senegal
- Sheep
- Siberia
- Singapore

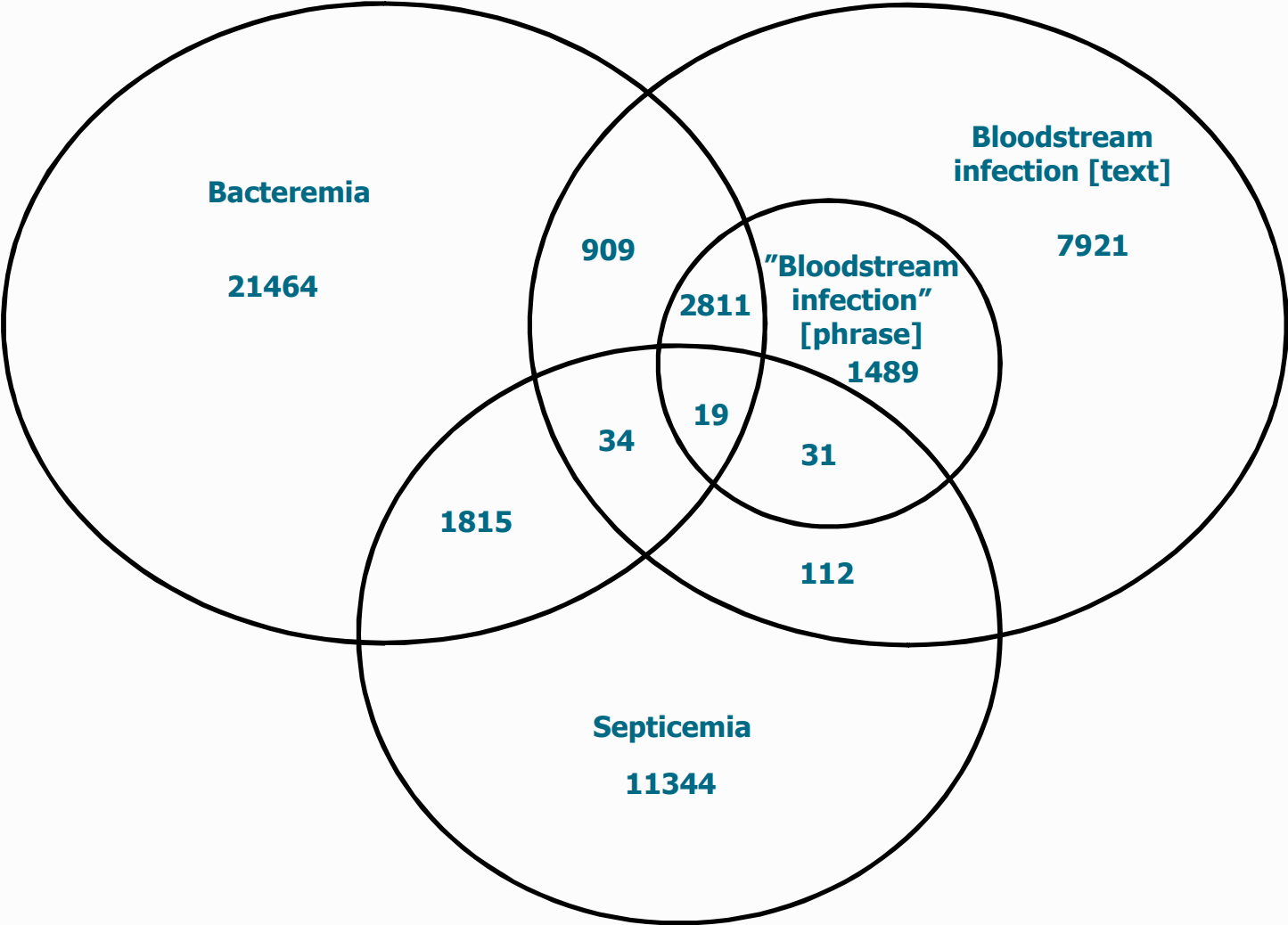
Query	Automatic query translation	Articles
Bacteremia	"bacteremia"[All Fields] OR "bacteremia"[MeSH Terms]	25,522
Blood stream infection	("blood"[Subheading] OR "blood"[All Fields] OR "blood"MeSH Terms) AND ("rivers"[MeSH Terms] OR "rivers"[All Fields] OR "stream"[All Fields]) AND ("infection"[MeSH Terms] OR "infection"[All Fields] OR "communicable diseases"[MeSH Terms] OR ("communicable"[All Fields] AND "diseases"[All Fields]) OR "communicable diseases"[All Fields])	825
Blood stream infections	---	951
Bloodstream infection	("blood circulation"[MeSH Terms] OR ("blood"[All Fields] AND "circulation"[All Fields]) OR "blood circulation"[All Fields] OR "bloodstream"[All Fields]) AND ("infection"[MeSH Terms] OR "infection"[All Fields] OR "communicable diseases"[MeSH Terms] OR ("communicable"[All Fields] AND "diseases"[All Fields]) OR "communicable diseases"[All Fields])	9,554
Bloodstream infections	---	10,926
Combined bloodstream infection queries [text]	---	11,796
“Bloodstream infection” [phrase]**	"blood stream infection"[All Fields] OR "blood stream infections"[All Fields] OR "bloodstream infection"[All Fields] OR "bloodstream infections"[All Fields]	2,820
Septicemia	"septicaemia"[All Fields] OR "septicemia"[All Fields]	13,355

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Relation between recovered articles



Rank order of the top 10 MeSH term

Rank	Bacteremia (%)		Bloodstream infection [text] (%)		Bloodstream infection [phrase] (%)		Septicemia (%)	
1	Bacteremia	51.4	Bacteremia	12.9	Cross Infection	40.7	Sepsis	40.6
2	Anti-Bact.Agents	18.6	Sepsis	12.4	Bacteremia	39.6	Anti-Bact.Agents	11.1
3	Sepsis	16.9	Cross Infection	11.9	Risk Factors	21.4	Bacteremia	9.1
4	Staph. Inf.	10.5	Shock Septic	10.9	CVK	20.3	Bacterial Inf.	7.5
5	Cross Infection	10.0	Microcirculation	10.1	Anti-Bact. Agents	18.8	Staph.Inf.	7.4
6	Endotoxemia	9.9	Risk Factors	8.4	Sepsis	15.3	Time Factors	5.1
7	Risk Factors	9.6	Anti-Bact. Agents	7.9	Incidence	12.8	Strep. Inf.	4.9
8	Microbial Sens.	7.2	Blood Flow	7.7	Catheters	12.8	Risk Factors	4.8
9	Time Factors	5.9	Hemodynamics	7.3	ICU	12.8	PostOP complic.	4.5
10	Bacterial Inf.	5.8	Time Factors	7.1	Microbial Sens.	12.0	Cross Infection	4.5



Pair wise comparison of topic similarity

	Cosine similarity of extracted MeSH terms			
	Bacteremia	Bloodstream infection [text]	Bloodstream infection [phrase]	Septicemia
Bacteremia	---	0.71	0.78	0.64
Bloodstream infection [text]	---	---	0.71	0.64
Bloodstream infection [phrase]	---	---	---	0.52

Summary

- Inconsistent terminology has a major impact on the yield of articles
- Only 1 of 5 potentially relevant articles on bloodstream infection was captured by bacteremia
- Free-text vs. phrase: very different results!
- Topic similarity between queries was only modest

Can we enhance effective retrieval?



Preference for “natural language” – a leap of faith?

BMJ1996;313:1658-1659

WORDS

Mizspellin and Medline

Table 1

Results of Medline search using 10 misspelt textwords

Misspelt term (correct spelling)	No of misspelt citations retrieved	No (%) with misspelling in title alone	No (%) with misspelling in abstract alone	No (%) of potentially missed citations using textword search alone
Angima (angina)	3	2 (67)	1 (33)	1 (33)
Antibiotics (antibiotics)	15	6 (40)	9 (60)	8 (53)
Asprin (aspirin)	13	5 (38)	8 (62)	7 (54)
Canzer (cancer)	0	0	0	0
Dopler (Doppler)	8	3 (38)	5 (63)	5 (63)
Cholestrol (Cholesterol)	47	9 (19)	38 (81)	25 (53)
Hamorrhage (haemorrhage)	4	1 (25)	3 (75)	2 (50)
Myocardial infraction (myocardial infarction)	96	22 (23)	71 (74)	41 (43)
Spetic (septic)	10	5 (50)	5 (50)	7 (70)
Thrombolism (thromboembolism)	4	3 (75)	1 (25)	2 (50)
Total	200	56 (28)	141 (71)	98 (49)



Random:

radnom

ramdom

randon

ramdon

BMJ 1997;314:1203 (Published 19 April 1997)

Letter

MeSH terms must be used in Medline searches

Mike Clarke, Imperial Cancer Research Fund research assistant^a, Liz Greaves, Research assistant^a, Sam James, Research assistant^a

But what about “bloodstream infection”?!

Consult with librarians!

For expert literature searching, call a librarian

The unfortunate death of a healthy woman who was a volunteer participant in a medical investigation at Johns Hopkins University in Baltimore has raised questions about the safety of study participants.¹ One of the issues that was raised by investigations into this tragedy is the importance of effective literature searching.²

The mission of the Canadian Health Libraries Association is to improve health and health care by promoting excellence in access to information. Since 1976 the association has represented health librarians and library staff and today it has over 400 members.

Librarians have a master's degree in library and information science and are

educated and skilled in information retrieval and literature searching. Effective literature searching cannot be done by simply surfing a few hits found through free-text searching; it involves an intellectual process that requires an iterative methodology that includes expert knowledge of database design (including controlled vocabulary), knowledge of research methodology and familiarity with the subject. It is necessary for investigators to understand the importance of collaborating with librarians.

The association recommends that guidelines or standards be developed for literature searching in health care. We will work with other groups to assist in their development and will promote these to our membership.

Jessie McGowan

President

Canadian Health Libraries Association
Ottawa, Ont.

The best remedy?

- To agree on the terminology and communicate it to the scientific community
- To add bloodstream infection as entry term to bacteremia in the MeSH vocabulary



MeSH vocabulary suggestions

★ MeSH Celebrates Its 50th Birthday: 1960-2010 [Details](#)



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MeSH Staff



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