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```
function initSelector(element){ $(' .skiptocontent').removeAttr("href"); $( element ).parent().before( "" );
window.location.hash = '#top'; $(window).scrollTop($("#top").offset().top-100);
window.location.hash=""; } $('#skiptocontent').keydown(function (e) { var code; try { code =
(window.event) ? window.event.keyCode : event.which; } catch(err) { code = e.keyCode || e.which; }
//click Enter if(code == 13){ var mainPageId=$("#main-page-content").text(); if(mainPageId){
initSelector('#main-page-content'); }else{ var firstH1=$('#h1:first').text(); if(firstH1){
initSelector('h1:first'); }else{ $('#skiptocontent').css('display','none'); } } } });
```

showDfpAd(0)

---

\$(document).on("ready", sageQuickSearch.init('chpc'));

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```
$(document).on("ready", sageQuickSearch.init('chpc'));
```

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Sign In

National Science Library

Society

```
addClass('enhancedLoginPanel', 'doNotShow'); function initLoginBox() { if (hasPersonIdentity())  
$$('#profileContainerMobile img.loggedInArrow').show(); else { $$('#profileContainerMobile  
img.loggedInArrow').hide(); //$$('#myprofile-label').text("Sign In"); }; $$('#portalLoginBar .sage-login-  
widget').attr('tabindex', '0'); $$('#sage-login-widget img.user-logo').each(function(){  
//console.log($(this).attr('src')); if($(this).attr('src').indexOf('templates')===-1)
```

---

```
$(this).addClass('bannerImage'); else $(this).removeClass('bannerImage'); }); initMyProfileInfo();  
initInstitutionInfo(); initSocietyInfo(); if (inPbEditorMode()) $('sage-login-widget').attr('onclick',  
'toggleLoginPopup(true);return false;'); if (isIE()) { $("img.user-logo").each(function () { let imgUrl =  
$(this).prop("src"); if (imgUrl) { $(this).css("backgroundImage", 'url(' + imgUrl + ')').addClass("ie-object-  
fit"); $(this).prop("src", ""); } }); } }
```

## Access Options

You can be signed in via any or all of the methods shown below at the same time.

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Sign in here to access free tools such as favourites and alerts, or to access personal subscriptions

---

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I am signed in as:

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---

---

```
function initMyProfileInfo() { $('<div id=person-activated>img.user-logo').attr('title', 'You are signed in via
your profile'); $('<div id=person-deactivated>img.user-logo').attr('title', 'You are not signed in via your
profile'); $('#frmLogin br').hide(); $('#user-login-form #passwordReminder').insertBefore('#user-login-
form #frmLogin tr:last-child'); $('
Set new password
').appendTo('#user-login-form #passwordReminder'); $('#ru-user').attr('href',
'/action/doLogout?redirectUri='+window.location.href); $('#user-login-form .loginForm
label[for="password"]').append(':'); if (hasPersonIdentity()) { $('#user-info').show(); $('#user-login-
form').hide(); } else { $('#user-info').hide(); $('#user-login-form').show(); } let $user=$('#portalLoginBar
.my-profile-col.id-person-activated'); if ($user && $user.attr('name') && $user.attr('name').length>0) {
$('
'+$user.attr('name')+
').appendTo('#user-name'); } }
```

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---

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National Science Library

```
function setInstitutionLoginStatus() { let samlExists=($('.access-via-saml').length)>0; let  
appendTag=""; if (samlExists) { appendTag+='
```

Signed in via: **a federated identity**

```
'; } else { appendTag+='
```

Sign in via: [Shibboleth](#)

```
'; appendTag+='
```

Sign in via: [Open Athens](#)

```
'; } $('#inst-login-status').append(appendTag); } function setRedirectUrl() { let currentUrl =  
window.location.pathname; $('.Shibboleth').attr("href", $('.Shibboleth').attr('href') + currentUrl);  
$('.OpenAthens').attr("href", $('.OpenAthens').attr('href') + currentUrl); } function initInstitutionInfo() {  
setInstitutionLoginStatus(); setRedirectUrl(); if ($('#id-institution-activated>img.user-  
logo').attr('title')===undefined) $('#id-institution-activated>img.user-logo').attr('title', 'You are signed in
```

---

via your institution'); \$('#.id-institution-deactivated>img.user-logo').attr('title', 'You are not signed in via an institution'); \$('#institution-info .portalInstitutionalButton').after('

## my institutional subscription

```
'); //if ($('#institution-info .portalInstitutionalButton a').length) $('#institution-info .portalInstitutionalButton a').text(); if (hasInstitutionIdentity()) { $('#institution-info').show(); $('#institution-login-form').hide(); } else { $('#institution-info').hide(); $('#institution-login-form').show(); } }
```

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- View or download all content the institution has subscribed to.

## Society

If you have access to journal via a society or associations, read the instructions below

---

Members of \_ can log in with their society credentials below

Username (required)

Password (required)

Society (required)

Access to society journal content varies across our titles.

If you have access to a journal via a society or association membership, please browse to your society journal, select an article to view, and follow the instructions in this box.

Contact us if you experience any difficulty logging in.

Some society journals require you to create a personal profile, then activate your society account

[Activate my Society Account](#)

I am signed in via:

```
function getYmCount() { let rv=0; try{ rv=Number("0"); if (isNaN(rv)) rv=0; } catch (e) {} return rv; }  
function getSocietyJournals(index) { let rv=""; try { switch (index) { case 1:rv=""; break; case 2:rv="";  
break; case 3:rv=""; break; case 4:rv=""; break; case 5:rv=""; break; default:break; } } catch (e) {}  
return rv; }
```

```
$('#ru-society').attr('href', '/action/doLogout?redirectUri='+window.location.href); function  
restyleJournalAd(){ if ($('#society-login-form .literatumAd').length!==0) { $('#society-login-form  
#society-info-text, #society-login-form .topSeparator').hide(); } } function initSocietyInfo() { if ($('#.id-  
society-activated>img.user-logo').attr('title')===undefined) $('#.id-society-activated>img.user-  
logo').attr('alt', 'You are signed in via your society'); $('#.id-society-deactivated>img.user-  
logo').attr('title', 'You are not signed in via a society'); $('#society-info .portallnsitutionalButton').after('
```

## my society or association

```
'); if (hasSocietyIdentity()){ $('#society-info').show(); $('#society-login-form').hide(); } else {  
restyleJournalAd(); $('#society-info').hide(); $('#society-login-form').show(); } } function  
getYmSocietyIndex(){ let count = getYmCount() || 0; let currentJournal = "chp"; if  
(currentJournal.length!==0 && count>0) { console.log("Looking through "+count+" societies for journal  
code: "+currentJournal); for (i=0; i
```

—

—

```
if ('0.4822.7201.098CiteScoreSCImago Journal Rank (SJR)151563'.trim().length>0)
$('.impactFactorContainer').removeClass('not-show-important'); if ($("#impact-factor-container") &&
$("#impact-factor-container").size(>0) $("#showAllSocietiesBtn").addClass("ifBorder"); switch
($('#showNoFoldedSocietyLogos .societyImageLink').size()) { case 2:
$('#showNoFoldedSocietyLogos').addClass('two-logos'); break; case 1:
$('#showNoFoldedSocietyLogos').addClass('one-logo'); break; case 0: default: break; } function
resizeHeaderFont() { var headerTitleElement = document.getElementById('headerTitle'); if
(headerTitleElement) { var fontsize = 32; if (" && "FALSE"=="TRUE") fontsize=28;
$('#headerTitle').css('font-size', fontsize+"px"); /*Max font size, then reduce from there*/
$('#headerTitle h1').css('font-size', fontsize+"px"); /*Max font size, then reduce from there - journal
home only*/ var headerTitleSize = headerTitleElement.getBoundingClientRect(); var textHeight =
headerTitleSize.height; var textWidth = headerTitleSize.width; var containerElement =
document.getElementById('headerTitleContainer'); var containerSize =
containerElement.getBoundingClientRect(); var containerHeight = containerSize.height; var
containerWidth = containerSize.width; var fontstring = ""; while (textHeight > containerHeight) {
fontsize--; fontstring = fontsize.toString(); fontstring = fontstring + "px"; $('#headerTitle').css('font-size',
fontstring); $('#headerTitle h1').css('font-size', fontstring); headerTitleSize =
headerTitleElement.getBoundingClientRect(); textHeight = headerTitleSize.height; textWidth =
headerTitleSize.width; } } }; resizeHeaderFont(); $(window).resize(function() { resizeHeaderFont(); });
```

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```
function offset(el) { let rect = el.getBoundingClientRect(), scrollLeft = window.pageXOffset ||
document.documentElement.scrollLeft, scrollTop = window.pageYOffset ||
document.documentElement.scrollTop; return { top: rect.top + scrollTop, left: rect.left + scrollLeft,
bottom: rect.bottom + scrollTop, right: rect.right + scrollLeft } } window.addEventListener("scroll",
function() { let y = window.pageYOffset; let $quickSearchId = $("#journalQuickSearch").parent(); if (y
>= offset(document.getElementById("portalQuickSearch")).bottom) {
$quickSearchId.removeClass("doNotShow"); } else { $quickSearchId.addClass("doNotShow"); } });
```

```
$(document).on("ready", sageQuickSearch.init('chpc'));
```

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$("#accept-cookie-policy").click(function() { $.get('/action/cookiePolicy?response=accept',  
function(data) { $(".cookiePolicy").remove(); }); });
```

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_ $(document).ready(function() { if( $('#openAccessSideMenu .showFullText').size() == 0) ||  
(isDesktop() && $('#openAccessSideMenu').find('.noAccess').size() !=0) ) {  
$('#mobileContents').closest('.general-html-asset').addClass('hide');  
$('.mobileToolLink').addClass('double-button'); } });
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var script = document.createElement('script'); script.type='text/javascript';  
script.src='//s7.addthis.com/js/250/addthis_widget.js#pubid=xa-4faab26f2cff13a7'; script.async = true;  
$('head').append(script)
```

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$(document).ready(function () { if ($(".articleTools .rightsLink").length) {  
$(".permissionsToolContainer").css("display", "inherit"); } });
```

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```
$('#div.articleToolsLinks').insertBefore('li.RelatedArticles'); $('#div.pdf-no-access a').removeAttr('href');  
$('#copyToClipboard').attr('data-item-name', 'copy-citation'); $('#articleCitationDownloadContainer,  
#articleShareContainer, #articlePermissionsContainer').click(function () { articleToolsToggle(); });  
$(".popup-dialog").on("click", function(event){ event.stopPropagation(); }); $('#  

```

—

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```
function addFlashMovie(id, flv) { var flashvars = {file: flv ,type: 'flv'}; var params = {allowfullscreen :true}; var attributes = {}; swfobject.embedSWF('/flvplayer.swf', id, "352", "288", "7.0.0", false, flashvars, params, attributes); } function addFlashMovie(id, flv, image) { var flashvars = {file: flv ,type: 'flv', image: image}; var params = {allowfullscreen :true}; var attributes = {}; swfobject.embedSWF('/flvplayer.swf', id, "352", "288", "7.0.0", false, flashvars, params, attributes); }
```

## **Thiamine (Vitamin B<sub>1</sub>)**



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[Aviva Fattal-Valevski](#)

Tel Aviv University, Tel Aviv, Israel, afatal@post.tau.ac.il

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/\* \* Check the number of Author's \* if less than '3' we not display expandable-author \* \*/ var  
numItems = \$('contribDegrees').length; if(numItems

**Keywords** [thiamine](#), [vitamin B1](#), [beriberi](#), [Wernicke-Korsakoff syndrome](#), [neuropathy](#),  
[cardiomyopathy](#)

Bontius J. De paralyseos quadam specie quam  
indigenae beriberi vocant. In: De Medicina  
Indorum 1645 lib. 3, cap I. Lugdum, Batavia .  
[Google Scholar](#)

---

The bacillus of beriberi. Science. 1884;3:331-  
332.  
[Google Scholar](#) | [Medline](#)

---

Beri-beri and anchylostomiasis. BMJ. 1892;2:  
28-29.  
[Google Scholar](#) | [Crossref](#) | [Medline](#)

---

Ashmead AS Three ships with beriberi outbreaks  
shown to have had extensive formation of  
carbonic oxides during the voyage- analysis of  
beriberi blood. Conclusion that beriberi is nothing  
but carbonic poisoning of the blood. Science .  
1893;22:48-49.  
[Google Scholar](#)

---

Macleod N. Can beri-beri be caused by food  
supplies from countries where beri-beri is  
endemic? BMJ. 1897;2:390-392.  
[Google Scholar](#) | [Crossref](#) | [Medline](#)

---

Ross R. , Reynolds ES A case of beri-beri (?)

---

possibly due to arsenic poisoning. Br Med J. 1901;2:979-980.

[Google Scholar](#) | [Crossref](#) | [Medline](#)

---

Rosenfeld L. Vitamine-vitamin. The early years of discovery . Clin Chem. 1997;43:4:680-685.

[Google Scholar](#) | [Medline](#) | [ISI](#)

---

Funk C. On the chemical nature of the substance which cures polyneuritis in birds induced by a diet of polished rice. J Physiol. 1911;43:395-400.

[Google Scholar](#) | [Crossref](#) | [Medline](#)

---

Funk C. The etiology of the deficiency diseases. Beri-beri, polyneuritis in birds, epidemic dropsy, scurvy, experimental scurvy in animals, infantile scurvy, ship beri-beri, pellagra. J State Med ( London). 1912;20:341-368.

[Google Scholar](#)

---

Jansen BCP , Donath WF On the isolation of antiberiberi vitamin. Proc Kon Ned Akad Wet. 1926;29:1390.

[Google Scholar](#)

---

Williams RR , Cline JK Synthesis of vitamin B1. J Am Chem Soc. 1936;58:1504-1505.

[Google Scholar](#) | [Crossref](#)

---

Williams RR The chemistry and biological significance of thiamin. Science. 1938;87:559-563.

[Google Scholar](#) | [Crossref](#) | [Medline](#)

---

Cline JK , Williams RR , Finkelstein J. Nutrition classics. Journal of the American Chemical Society 59:1052-4, 1937. Synthesis of vitamin B1. By Joseph K. Cline, Robert R. Williams, and Jacob Finkelstein. Nutr Rev. 1977;35:238-240.

[Google Scholar](#)

---

Dewardener HE , Lennox B. Cerebral beriberi (Wernicke's encephalopathy): review of 52 cases in a Singapore prisoner-of-war hospital . Lancet. 1947;4:11-17.

[Google Scholar](#) | [Crossref](#)

---

Thomson AD , Cook CC , Guerrini I. , Sheedy D. , Harper C. , Marshall EJ Wernicke's encephalopathy revisited. Translation of the case history section of the original manuscript by Carl

---

Wernicke *Ärztliche Lehrbuch der  
Gehirnkrankheiten für Aerzte und  
Studierende* (1881) with a  
commentary. *Alcohol Alcohol*. 2008;43:174-179.  
[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

World Health Organization. Thiamine Deficiency  
and Its Prevention and Control in Major  
Emergencies. Geneva, Switzerland: Department  
of Nutrition for Health and Development, World  
Health Organization; 1999.  
[Google Scholar](#)

---

Butterworth RF , Kril JJ , Harper CG Thiamine-  
dependent enzyme changes in the brains of  
alcoholics: relationship to the Wernicke-Korsakoff  
syndrome. *Alcohol Clin Exp Res*. 1993;  
17:1084-1088.  
[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Bubber P. , Ke ZJ , Gibson GE Tricarboxylic acid  
cycle enzymes following thiamine deficiency.  
*Neurochem Int*. 2004;45: 1021-1028.  
[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Blass JP , Gibson GE Abnormality of a thiamine-  
requiring enzyme in patients with Wernicke-  
Korsakoff syndrome. *New Engl J Med*. 1977  
;297:1367-1370.  
[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Pekovich SR , Martin PR , Singleton CK  
Thiamine deficiency decreases steady-state  
transketolase and pyruvate dehydrogenase but  
not alpha-ketoglutarate dehydrogenase mRNA  
levels in three human cell types. *J Nutr* .  
1998;128:683-687.  
[Google Scholar](#) | [Medline](#) | [ISI](#)

---

Gibson GE , Ksiezak-Reding H. , Sheu KF ,  
Mykityn V. , Blass JP Correlation of enzymatic,  
metabolic, and behavioral deficits in thiamin  
deficiency and its reversal. *Neurochem Res*.  
1984;9: 803-814.  
[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Aikawa H. , Watanabe IS , Furuse T. , et al. Low  
energy levels in thiamine-deficient  
encephalopathy. *J Neuropathol Exp Neurol*.  
1984;43:276-287.

Holowach J. , Kauffman F. , Ikossi MG , Thomas C. , McDougal DB Jr. The effects of a thiamine antagonist, pyrithiamine, on levels of selected metabolic intermediates and on activities of thiamine-dependent enzymes in brain and liver. J Neurochem . 1968;15: 621-631.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

McCandless DW , Schenker S. , Cook M. Encephalopathy of thiamine deficiency: studies of intracerebral mechanisms. J Clin Invest . 1968;47:2268-2280.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Hakim AM The induction and reversibility of cerebral acidosis in thiamine deficiency . Ann Neurol. 1984;16:673-679.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Bettendorff L. Thiamine homeostasis in neuroblastoma cells . Neurochem Int. 1995;26: 295-302.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Pannunzio P. , Hazell AS , Pannunzio M. , Rao KV , Butterworth RF Thiamine deficiency results in metabolic acidosis and energy failure in cerebellar granule cells: an in vitro model for the study of cell death mechanisms in Wernicke's encephalopathy. J Neurosci Res. 2000;62:286-292.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Zhang SX , Weilersbacher GS , Henderson SW , Corso T. , Olney JW , Langlais PJ Excitotoxic cytopathology, progression, and reversibility of thiamine deficiency-induced diencephalic lesions. J Neuropathol Exp Neurol. 1995;54:255-267.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Wang JJ , Hua Z. , Fentress HM , Singleton CK JNK1 is inactivated during thiamine deficiency-induced apoptosis in human neuroblastoma cells. J Nutr Biochem. 2000;11:208-215.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Heinrich CP , Stadler H. , Weiser H. The effect of thiamine deficiency on the acetylcoenzyme A and

---

acetylcholine levels in the rat brain . J Neurochem. 1973;21:1273-1281.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Jankowska-Kulawy A. , Bielarczyk H. , PaweÅczyk T. , WrÅblewska M. , Szutowicz A. Acetyl-CoA and acetylcholine metabolism in nerve terminal compartment of thiamine deficient rat brain. J Neurochem. 2010;115:333-342.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Gaitonde MK , Fayein NA , Johnson AL Decreased metabolism in vivo of glucose into amino acids of the brain of thiamine-deficient rats after treatment with pyriethamine . J Neurochem. 1975;24: 1215-1223.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Hazell AS , Butterworth RF , Hakim AM Cerebral vulnerability is associated with selective increase in extracellular glutamate concentration in experimental thiamine deficiency. J Neurochem. 1993;61:1155-1158.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

HÃ©roux M. , Butterworth RF Reversible alterations of cerebral gamma-aminobutyric acid in pyriethamine-treated rats: implications for the pathogenesis of Wernicke's encephalopathy. J Neurochem . 1988;51: 1221-1226.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Langlais PJ , Zhang SX Extracellular glutamate is increased in thalamus during thiamine deficiency-induced lesions and is blocked by MK-801 . J Neurochem. 1993;61:2175-2182.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Todd KG , Butterworth RF Evaluation of the role of NMDA mediated excitotoxicity in the selective neuronal loss in experimental Wernicke encephalopathy. Exp Neurol. 1998; 149:130-138.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Slekar KH , Kosman DJ , Culotta VC The yeast copper/zinc super-oxide dismutase and the pentose phosphate pathway play overlapping roles in oxidative stress protection. J Biol Chem. 1996;271: 28831-28836.

Calingasan NY , Chun WJ , Park LC , Uchida K. , Gibson GE Oxidative stress is associated with region- specific neuronal death during thiamine deficiency . J Neuropathol Exp Neurol. 1999; 58:946-958.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Boros LG , Steinkamp MP , Fleming JC , Lee WN , Cascante M. , Neufeld EJ Defective RNA ribose synthesis in fibroblasts from patients with thiamine-responsive megaloblastic anemia (TRMA). Blood. 2003;102:3556-3561.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Blair PV , Kobayashi R. , Edwards HM 3rd , Shay NF , Baker DH , Harris RA Dietary thiamin level influences levels of its diphosphate form and thiamin-dependent enzymic activities of rat liver. J Nutr . 1999 ;129:641-648.

[Google Scholar](#) | [Medline](#) | [ISI](#)

---

Zieve L. , Doizaki WM , Stenroos LE Effect of magnesium deficiency on blood and liver transketolase activity and on the recovery of enzyme activity in thiamine-deficient rats receiving thiamine . J Lab Clin Med. 1968;72:268-277.

[Google Scholar](#) | [Medline](#)

---

Morgan MY Alcohol and nutrition. Br Med Bull. 1982;38:21-29.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Traviesa DC Magnesium deficiency: a possible cause of thiamine refractoriness in Wernicke-Korsakoff encephalopathy. J Neurol Neurosurg Psychiatry. 1974;37:959-962.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Mclean J. , Manchip S. Wernicke's encephalopathy induced by magnesium depletion. Lancet. 1999;353:1768.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Rao J. , Oz G. , Seaquist ER Regulation of cerebral glucose metabolism. Minerva Endocrinol . 2006;31:149-158.

[Google Scholar](#) | [Medline](#)

---

---

Siebert G. , Gessner B. , Klasser M. Energy supply of the central nervous system. In: Somogyi JC , Hotzel D , eds. Nutrition and Neurobiology. Basel, Switzerland: Karger; 1986:1-26.

[Google Scholar](#) | [Crossref](#)

---

Ishii K. , Sarai K. , Sanemori H. , Kawasaki T. Concentration of thiamine and its phosphate esters in rat tissues determined by high pressure liquid chromatography. J Nutr Sci Vitaminol (Tokyo). 1979;25:517-523.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

BÃfÂç A. Metabolic and structural role of thiamine in nervous tissues. Cell Mol Neurobiol. 2008 ;28:923-931.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Haas RH Thiamin and the brain. Annu Rev Nutr. 1988 ;8:483-515.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Itokawa Y. , Schultz RA , Cooper JA Thiamine in nerve membranes. Biochim Biophys Acta . 1972;266:293-299.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Matsuda T. , Cooper JR Thiamine as an integral component of brain synaptosomal membranes . Proc Natl Acad Sci U S A. 1981;78:5886-5889.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Goldberg DJ , Cooper JR Effects of thiamine antagonists on nerve conduction. I. Actions of antimetabolites and fern extract on propagated action potentials . J Neurobiol. 1975;6:435-452.

[Google Scholar](#) | [Crossref](#) | [Medline](#)

---

Goldberg DJ , Begenisich TB , Cooper JR Effects of thiamine antagonists on nerve conduction. II. Voltage clamp experiments with antimetabolites . J Neurobiol . 2004;6:453-462.

[Google Scholar](#) | [Crossref](#)

---

Tanaka C. , Itokawa Y. , Tanaka S. The axoplasmic transport of thiamine in rat sciatic nerve. J Histochem Cytochem. 1973;21:81-86.

[Google Scholar](#) | [SAGE Journals](#) | [ISI](#)

---

Bergquist JE , Hanson M. Axonal transport of

---

thiamine in frog sciatic nerves. Exp Neurol. 1983;79:622-629.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Sanjeeva TR , Ramakrishnan CV Effects of thiamine deficiency and undernutrition on the lipid composition of rat spinal cord at 21 days of age. J Neurosci Res. 1983;9:111-114.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Terasawa M. , Nakahara T. , Tsukada N. , Sugawara A. , Itokawa Y. The relationship between thiamine deficiency and performance of a learning task in rats. Metab Brain Dis . 1999 ;14:137-148.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Claus D. , Eggers R. , Warecka K. , Neundorfer B. Thiamine deficiency and nervous system function disturbances. Eur Arch Psychiatry Neurol Sci. 1985;234:390-394.

[Google Scholar](#) | [Crossref](#) | [Medline](#)

---

Ramakrishna T. Vitamins and brain development. Physiol Res. 1999;48:175-187.

[Google Scholar](#) | [Medline](#) | [ISI](#)

---

Georgieff MK Nutrition and the developing brain: nutrient priorities and measurement. Am J Clin Nutr. 2007;85:614S-620S.

[Google Scholar](#) | [Medline](#) | [ISI](#)

---

Fournier H. , Butterworth RF Effects of thiamine deficiency on thiamine-dependent enzymes in regions of the brain of pregnant rats and their offspring. Metab Brain Dis. 1990;5:77-84.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Trostler N. , Guggenheim K. , Havivi E. , Sklan D. Effect of thiamine deficiency in pregnant and lactating rats on the brain of their offspring . Ann Nutr Metab. 1977;21:294-304.

[Google Scholar](#) | [Crossref](#)

---

Trostler N. , Sklan D. Lipogenesis in the brain of thiamine-deficient rat pups. J Nutr Sci Vitaminol (Tokyo ). 1978;24: 105-111.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Matsuda T. , Doi T. , Tonomura H. , Baba A. ,



---

Iwata H. Postnatal development of thiamine metabolism in rat brain. J Neurochem. 1989 ;52:842-846.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

BÃfÂç A. , NÃçÂ€Â™Douba V. , DÃçÂ€Â™Almeida AM , Seri V. Effect of maternal thiamine deficiency on the pyramidal and granule cells of the hippocampus of rat pups. Acta Neurobiol Exp. 2005;65:387-398.

[Google Scholar](#) | [Medline](#) | [ISI](#)

---

BÃfÂç A. , Seri BVPsychomotor functions in developing rats: ontogenetic approach to structure-function relationships. Neurosci Biobehav Rev. 1995;19:413-425.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

BÃfÂç A. Functional vulnerability of developing central nervous system to maternal thiamine deficiencies in the rat. Dev Psychobiol. 2005 ;47:408-414.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Rindi G. , Casirola D. , Poggi V. , De Vizia B. , Patrini C. , Laforenza U. Thiamine transport by erythrocytes and ghosts in thiamine-responsive megaloblastic anaemia. Inherit Metab Dis. 1992;15: 231-242.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Singleton CK , Martin PR Molecular mechanisms of thiamine utilization . Curr Mol Med. 2001;1: 197-207.

[Google Scholar](#) | [Crossref](#) | [Medline](#)

---

Labay V. , Raz T. , Baron D. , et al. Mutations in SLC19A2 cause thiamine responsive megaloblastic anaemia associated with diabetes mellitus and deafness. Nat Genet. 1999;22: 300-304.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes for Vitamins. Washington, DC: National Academies Press; 2004.

[Google Scholar](#)

---

Watson AJ , Walker JF , Tomkin GH , Finn MM ,

---

Keogh JA Acute Wernicke's encephalopathy precipitated by glucose loading .  
Ir J Med Sci. 1981;150:301.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Thanangkul O. , Whitaker JA , Fort EG  
Malnutrition in northern Thailand. Am J Clin Nutr.  
1966;18:379-389.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Tang CM , Rolfe M. , Wells JC , Cham K.  
Outbreak of beri-beri in The Gambia. Lancet.  
1989;2:206-207.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

McGready R. , Simpson JA , Cho T. , et al.  
Postpartum thiamine deficiency in a Karen  
displaced population . Am J Clin Nutr. 2001  
;74:808-813.

[Google Scholar](#) | [Medline](#) | [ISI](#)

---

Tallaksen CM , B  hmer T. , Bell H. Blood and  
serum thiamin and thiamin phosphate esters  
concentrations in patients with alcohol  
dependence syndrome before and after thiamin  
treatment. Alcohol Clin Exp Res. 1992;16:320-  
325.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Hoyumpa AM Jr. Mechanisms of thiamin  
deficiency in chronic alcoholism . Am J Clin Nutr.  
1980;33:2750-2761.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Ogershok PR , Rahman A. , Nestor S. , Brick J.  
Wernicke encephalopathy in nonalcoholic patients  
. Am J Med Sci. 2002;323:107-111.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Nadel M. , Burger PC Wernicke's encephalopathy following prolonged intravenous  
therapy . JAMA. 1976;235:2403-2405.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

MacLean LD , Rhode BM , Shizgal HM Nutrition  
following gastric operations for morbid obesity.  
Ann Surg. 1983;198:347-355.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Drenick EJ , Joven CB , Swendseid ME

---

Occurrence of acute Wernicke's encephalopathy during prolonged starvation for treatment of obesity. New Engl J Med. 1966 ;274:937-939.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Chiossi G. , Neri I. , Cavazzuti M. , Basso G. , Facchinetti F. Hyperemesis gravidarum complicated by Wernicke encephalopathy: background, case report, and review of the literature. Obstet Gynecol Surv. 2006; 61:255-268.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Handler CE , Perkin GD Anorexia nervosa and Wernicke's encephalopathy: an underdiagnosed association . Lancet. 1982;2: 771-772.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Lee DC , Chu J. , Satz W. , Silbergleit R. Low plasma thiamine levels in elder patients admitted through the emergency department. Acad Emerg Med. 2000 ;7:1156-1159.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Jamieson CP , Obeid OA , Powell-Tuck J. The thiamin, riboflavin and pyridoxine status of patients on emergency admission to hospital. Clin Nutr . 1999;18:87-91.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Seear M. , Lockitch G. , Jacobson B. , Quigley G. , MacNab A. Thiamine, riboflavin, and pyridoxine deficiencies in a population of critically ill children. J Pediatr. 1992 ;121:533-538.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Centers for Disease Control and Prevention. Lactic acidosis traced to thiamine deficiency related to nationwide shortage of multivitamins for total parenteral nutrition. MMWR Morb Mortal Wkly Rep. 1997;46:523.

[Google Scholar](#) | [Medline](#)

---

Alloju M. , Ehrinpreis MN Shortage of intravenous multivitamin solution in the United States . New Engl J Med. 1997;337:54.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Hahn JS , Berquist W. , Alcorn DM , Chamberlain

---

L. , Bass D. Wernicke encephalopathy and beriberi during total parenteral nutrition attributable to multivitamin infusion shortage. Pediatrics . 1998; 101:E10.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Fattal-Valevski A. , Kesler A. , Sela B. , et al. Outbreak of life-threatening thiamine deficiency in infants in Israel caused by a defective soy-based formula. Pediatrics. 2005;115:e233-e238.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Nishimune T. , Watanabe Y. , Okazaki H. , Akai H. Thiamin is decomposed due to Anophe spp. entomophagy in seasonal ataxia patients in Nigeria. J Nutr. 2000;130:1625-1628.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Brin M. Erythrocyte as a biopsy tissue for functional evaluation of thiamine adequacy . JAMA. 1964;187:762-766.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Yamasaki H. , Tada H. , Kawano S. , Aonuma K. Reversible pulmonary hypertension, lactic acidosis, and rapidly evolving multiple organ failure as manifestations of shoshin beriberi. Circ J 2010;74:1983-1985.

[Google Scholar](#)

---

Korsakoff SS Disturbance of psychic function in alcoholic paralysis and its relationship to disturbance in the psychic sphere in multiple neuritis of non alcoholic origin. Vestnik Psichiatrii. 1887;1V:fasc 2.

[Google Scholar](#)

---

Vasconcelos MM , Silva KP , Vidal G. , Silva AF , Domingues RC , Berditchevsky CR Early diagnosis of pediatric Wernicke's encephalopathy. Pediatr Neurol. 1999;20:289-294.

[Google Scholar](#) | [Crossref](#) | [Medline](#) | [ISI](#)

---

Victor M. , Adams RD , Collins GH The Wernicke-Korsakoff syndrome. A clinical and pathological study of 245 patients, 82 with post-mortem examinations. Contemp Neurol Ser. 1971;7:1-206.

[Google Scholar](#) | [Medline](#)

---

Langlais PJ , Zhang SX Cortical and subcortical

---

white matter damage without Wernicke's encephalopathy after recovery from thiamine deficiency in the rat. Alcohol Clin Exp Res. 1997;21: 434-443.

[Google Scholar](#) | [Medline](#) | [ISI](#)

---

Zhong C. , Jin L. , Fei G. MR imaging of nonalcoholic Wernicke encephalopathy: a follow-up study . AJNR Am J Neuroradiol. 2005;26: 2301-2305.

[Google Scholar](#) | [Medline](#) | [ISI](#)

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//document.getElementById('returnLink').href="/action/doLogout?redirectUri="+href;
$('.logOut').attr("href", "/action/doLogout?redirectUri="+href);
```

---

```
let $user=$('#portalLoginBar .my-profile-col.id-person-activated'); if ($user && $user.attr('name') && $user.attr('name').length>0) $('<u>+$user.attr('name')</u>+').appendTo('#denial-welcome span.individualUser');
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document.getElementById("denial-2-cn").style.display = "block";
document.getElementById("denial-2").style.display = "none";
```

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```
if ($('#span.institutionBannerText').length===0) { if ($('#img#accessLogo').length===0) { $('#denial-  
institution').hide(); } else { var altText = $('#.welcome span.institutionBannerLogo img').attr("alt"); var  
hrefText = $('#.welcome span.institutionBannerLogo a').attr("href"); console.log(altText+'-'+hrefText); if  
(!altText || altText.length===0) $('#.welcome span.institutionBannerLogo').clone().prependTo('#denial-  
institution div.error:first'); else { if (!hrefText || hrefText.length===0) $('#denial-institution  
div.error:first').prepend("+altText+"); else $('#denial-institution div.error:first').prepend("+altText+"); } }  
}
```

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var ppvOffers=0; var articleTitle="Thiamine (Vitamin B<sub>1</sub>)"; $('.ecommDenial  
#ecommerceForm>div').each(function(){ try{ let  
offerText=$($(this).find('b')[0]).text().trim().toLowerCase(); let  
offerId=$($(this).find('input[name="offerId"]')[0]).val(); let offerValue=" for "; if (offerText.length>Show  
details
```

---

[Exemplary calculations of native thiamine \(vitamin B1\) and riboflavin ... Crossref Show details](#)

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[Effect of variety and environment on the amount of thiamine and riboflavin ... Crossref Show details](#)

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showDfpAd(2)

---

Here we keep the JS functions that use context sensitive parameters, since these are not working outside HTML assets (e.g. in js files) function removeTlaFromTaxonomyFacet() { //SAGE-2005

```
"li.ConceptID.parentFacets").each(function(){ let $link = $(this).find(".facet-link-container a"); if ($link.length) { if ($link[0].innerHTML.toLowerCase().trim() === "chp".toLowerCase()) { $(this).css("display", "none"); // hide this //console.log("Removed TLA code from taxonomy filter"); if ($(this).parents(".hiddenChildrenFacets").length) { // If TLA code found in hidden facets, change the More(n) text to More(n-1) $(this).parents("div.facetContainer").find("div.toggleMoreFacets a.facet-link").each(function(){ if (this.innerHTML.toLowerCase().indexOf("more (") !== -1) { let moreNumber = this.innerHTML.match(/<.+>[0]; if (moreNumber > 1) $(this).text($(this).text().replace(moreNumber, moreNumber - 1)); else // if only one was hidden, no need to expand $(this).parent().css("display", "none"); } } } }); } function cpTitlesDates() { if ('cpv'==='cp' || 'cpv'==='cpv') { $('<div>.pubDate-left').addClass('not-show-important'); } } function deniedPdfAccess() { if ($('#accessOptionsTop').length > 0) { // clicked on page with access denial bar toggleDenialBar(); $('#accessOptionsTop input#login').focus(); } else { // no access denial bar window.location = '/doi/pdf/10.1177/1533210110392941'; } } function accesibilityImageAltText() { $('<div>.moreFromThisJournalModules img').each(function(){ if ($(this).attr('alt')===undefined) $(this).attr('alt', ''); $('<div>.portalResourcesContainer img, .tellUsImage img').attr('alt', ''); $('<div>.relatedJournalsTextContainer').each(function(){ let $journalText = $(this); $journalText.closest('<div>.relatedJournalsColumn>a').append($journalText.text()); $journalText.remove(); }); $('<div>.relatedJournalsImageContainer img').each(function(){ let $coverImage = $(this); let $parent = $(this).parent(); $coverImage.addClass('relatedJournalsImageContainer'); $coverImage.prependTo($coverImage.closest('<div>.relatedJournalsColumn>a')); $parent.remove(); }); $('<div>.td.savedSearch.savedResult:nth-child(4) img').attr('alt', function() { return $(this).attr('alt').replace('alert type', 'saved date'); }) $('<div>.td.savedSearch.savedResult:nth-child(5) img').attr('alt', function() { return $(this).attr('alt').replace('alert type', 'last run date'); }) } //run these before document finished loading //SAGE-1878 //if ($('#<div>.more-than').offset().left 0) $('#<div>.pb-ui .accessOptionsBar').css('display', 'block'); else $('#<div>.pb-accessOptionsBar').hide(); if ($('#<div>.span.related-Article-wrapper span').length===0) $('#<div>.span.related-Article-wrapper').hide(); cpTitlesDates(); // Add data module attributes in related journals HTML widget $(".otherSociety").attr("data-module-name", "related-journals"); $(".otherSocietyButton #viewMoreText").attr("data-item-name", "view-more"); $(".otherSocietyButton #viewLessText").attr("data-item-name", "view-fewer"); $(".otherSocietyButton #viewFewerText").attr("data-item-name", "view-fewer"); // Add a separator before issue //$('#<div>.mostReadCited .contentItemIssue').text(function () { // if ($(this).text().trim().length 0 && $(this).text().trim().indexOf('-')!=0) // return '-'+$(this).text(); //}); //Move related articles indication into proper place: $('#<div>.span.related-Article-wrapper').insertAfter('div.articleInformation'); $('#<div>.related-article-link').text(function() { return $(this).text().replace(/<div>.s*:/, ' '); }); $('#<div>.online-pub-date').text(function() { return $(this).text().replace(/<div>g, ' '); }); $('#<div>.contentItemVol').text(function() { return $(this).text().replace('Vol 0,', 'Vol. '); }); $('#<div>.issueFormat').text(function() { return $(this).text().replace('issue', 'Issue').replace('vol.', 'Vol').replace(/<div>s*:/, ' '); }); //Remove trailing dot from deleteAccountLink $('<div>.a.deleteAccountLink').text('Delete your account'); //Remove trailing dot from deleteAccountLink $('<div>.a#copyToClipboard').text('Copy to Clipboard'); // Rename "Views" to "Views and Downloads" $('#<div>.view-count').text(function() { if (inJournalScope()) return $(this).text().replace('Views:', 'Views and Downloads:'); else return $(this).text(); }); // Keep only anchor element if already in citedBy page if ($('#<div>.view-citedBy a').attr('href') === window.location.pathname) $('#<div>.view-all-citedBy a').attr('href', ''); // Add #top-content-scroll on 'View All' citedBy link $('#<div>.view-all-citedBy a').attr('href', $('#<div>.view-all-citedBy a').attr('href') + '#top-content-scroll'); // Change MR/MC panel text $('#<div>.mostReadCitedPage .online-pub-date').text(function() { return $(this).text().replace("Online publication date", "First published"); }); //Wait for images to load, before deciding whether to move the related journals $('<div>.journalHomeFourRight').imagesLoaded().always(function(){ moveRelatedJournals(); //console.log('Ad(right) image is loaded'); }); // Fix for 'more...' label falling into 2nd column if ($('#<div>.authors .more-than').length && $('#<div>.authors .more-than').offset().left 1)
```

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input[name=AllField]').autocomplete('close'); } catch(e) {} }); //console.log('Journal: Journal of Evidence-Based Integrative Medicine, Issue: , Article: Thiamine (Vitamin B<sub>1</sub>)');

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SN: 2515-690X  
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op var dataLayer = dataLayer || []; dataLayer.push({"site":{"environment":"live","platform":"responsive-  
eb"},"page":{"title":"Thiamine (Vitamin B1): Journal of Evidence-Based Complementary & Alternative  
medicine: Vol 16, No 1","type":"article/chapter-view"},"user":{"action":"showAbstract","id":596905178,"type":[]  
,"loginStatus":false,"authentication":false,"subscriptions":[],"institution":["National Science  
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Integrative Medicine","tla":"CHP","category":[],"subCategory":[],"open_access":"false","e_issn":"2515-690X","  
_issn":"2515-690X","issue":{"volume":"16","number":"1","article":{"doi":"10.1177/1533210110392941","title":  
"Thiamine (Vitamin B1)"}}}}}}); (function(w,d,s,l,i){w[l]=w[l]||[];w[l].push({'gtm.start':new  
Date().getTime(),event:'gtm.js'});var f=d.getElementsByTagName(s)[0],j=d.createElement(s),dl=!!'dataLayer'  
&l='+';j.async=true;j.src='https://www.googletagmanager.com/gtm.js?id='+i+dl;f.parentNode.insertBefore(j,  
)})(window,document,'script','dataLayer','GTM-5M58KS');
```