

FDA and ISMP Lists of Look-Alike Drug Names with Recommended Tall Man (Mixed Case) Letters

Since 2008, ISMP has maintained a list of drug name pairs or larger groupings with recommended, uppercase and bolded tall man (mixed case) letters to help draw attention to the dissimilarities in look-alike drug names. The list includes mostly generic-generic drug name pairs, although a few brand-brand or brand-generic name pairs are also included. The US Food and Drug Administration (FDA) list of drug names with recommended tall man letters was initiated in 2001 with the agency's Name Differentiation Project (www.ismp.org/ext/1072).

While numerous studies between 2000 and 2021 have demonstrated the ability of tall man letters alone or in conjunction with other text enhancements to improve the accuracy of drug name perception and reduce errors due to drug name similarity,¹⁻¹² some studies have suggested that the evidence is conflicting or the strategy is ineffective.¹³⁻¹⁶ The evidence has been mixed due in large part to methodological differences and significant study limitations. However, because gaps still exist in our full understanding of the role of tall man lettering in the clinical setting, ISMP is participating in a 4-year Northwestern University (Chicago) research project, led by Bruce L. Lambert, PhD, and funded by FDA, to assess the comparative effectiveness of various methods of drug name text enhancements and the ability of tall man lettering to reduce errors during drug selection. Meanwhile, there is sufficient evidence to suggest that the simple and straightforward technique of using tall man letters is worth implementing as one among numerous strategies to mitigate the risk of errors due to similar drug names.

To await irrefutable, scientific proof of effectiveness minimizes and undervalues the study findings and anecdotal evidence available today¹⁷ that support this important risk-reduction strategy. As such, the use of tall man letters has been endorsed by ISMP, The Joint Commission (TJC) (recommended but not required), FDA

(as part of its Name Differentiation Project), as well as other national and international organizations, including the World Health Organization (WHO) and the International Medication Safety Network (IMSN).¹⁸

Table 1 (page 2) provides an alphabetized list of FDA-approved established drug names with recommended tall man letters.

Table 2 (starting on page 3) provides an alphabetized list of additional drug names with recommendations from ISMP regarding the use and placement of tall man letters. This is not an official list approved by FDA. It is intended for voluntary use by healthcare practitioners, drug information vendors, and medication technology vendors. Any product label changes by manufacturers require FDA approval.

To promote standardization regarding which letters to present in uppercase/bold, ISMP follows a tested methodology whenever possible called the CD3 rule.¹⁹ The methodology suggests working from the left of the drug name first by capitalizing all the characters to the right once 2 or more dissimilar letters are encountered, and then, working from the right, returning 2 or more letters common to both words to lowercase letters. When the rule cannot be applied because there are no common letters on the right side of the name, the methodology suggests capitalizing the central part of the word only. When application of this rule fails to lead to the best tall man lettering option (e.g., makes names appear too similar, makes names hard to read based on pronunciation), an alternative option is considered.

To promote consistency, ISMP suggests following the bolded, tall man lettering schemes provided by FDA and ISMP for the drug name pairs listed in **Tables 1** (page 2) and **2** (starting on page 3).

FDA and ISMP Lists of Look-Alike Drug Names with Recommended Tall Man Letters

Table 1. FDA-Approved List of Generic Drug Names with Tall Man (Mixed Case) Letters	
Drug Name With Tall Man Letters	Confused With
aceta ZOLAMIDE	aceto HEXAMIDE*
aceto HEXAMIDE*	aceta ZOLAMIDE
bu PROP ion	bus PIR one
bus PIR one	bu PROP ion
CARBO platin	CIS platin
chlorpro MAZINE	chlorpro PAMIDE
chlorpro PAMIDE	chlorpro MAZINE
CIS platin	CARBO platin
clomi PHENE	clomi PRAMINE
clomi PRAMINE	clomi PHENE
cyclo SERINE	cyclo SPORINE
cyclo SPORINE	cyclo SERINE
DAUNO rubicin	DOXO rubicin
dimenhy DRINATE	diphenhy DRAMINE
diphenhy DRAMINE	dimenhy DRINATE
DOBU tamine	DOP amine
DOP amine	DOBU tamine
DOXO rubicin	DAUNO rubicin
gli PIZIDE	gly BURIDE
gly BURIDE	gli PIZIDE
hydr ALAZINE	HYDRO morphone — hydr OXY zine
HYDRO morphone	hydr ALAZINE — hydro OXY zine
hydro OXY zine	hydr ALAZINE — HYDRO morphone
medroxy PROGESTER one	methyl PREDNISolone — methyl TESTOSTER one
methyl PREDNISolone	medroxy PROGESTER one — methyl TESTOSTER one
methyl TESTOSTER one	methyl PREDNISolone — medroxy PROGESTER one
mig AL stat	mig LU stat
mig LU stat	mig AL stat
mito XANTRONE	Not specified
ni CARD ipine	NIFE dipine
NIFE dipine	ni CARD ipine
predni SONE	predni SONE
predni SONE	predni SONE
risperi DONE	ROPINI role
ROPINI role	risperi DONE
sulf ADIAZINE	sulf SOXAZOLE*
sulf SOXAZOLE*	sulf ADIAZINE
TOLAZ amide	TOLBUT amide*
TOLBUT amide*	TOLAZ amide
tra MAD ol	tra ZOD one
tra ZOD one	tra MAD ol
vin BLAS tine	vin CRIS tine
vin CRIS tine	vin BLAS tine

* These drugs have been discontinued and are not marketed in the United States.

FDA and ISMP Lists of Look-Alike Drug Names with Recommended Tall Man Letters

Table 2. ISMP List of Additional Drug Names with Tall Man (Mixed Case) Letters	
Drug Name With Tall Man Letters	Confused With
AL fentanil	fenta NYL — SUF entanil
ALPRAZ olam	clonaze PAM — LOR azepam
a MIL oride	am LODIP ine
am LODIP ine	a MIL oride
ARIP iprazole	RABE prazole
aza CITID ine	aza THIO prine
aza THIO prine	aza CITID ine
BUPI vacaine	ROPI vacaine
car BAM azepine	OX carbazepine
CARBO platin [†]	CIS platin [†]
ce FAZ olin	cefo TE tan — ce FOX itin — ce TAZ idime — ce TRIA Xone
cefo TE tan	ce FAZ olin — ce FOX itin — ce TAZ idime — ce TRIA Xone
ce FOX itin	ce FAZ olin — cefo TE tan — ce TAZ idime — ce TRIA Xone
ce TAZ idime	ce FAZ olin — cefo TE tan — ce FOX itin — ce TRIA Xone
ce TRIA Xone	ce FAZ olin — cefo TE tan — ce FOX itin — ce TAZ idime
Cele BREX [‡]	Cele XA [‡]
Cele XA [‡]	Cele BREX [‡]
chlordiaze POXIDE	chlorpro MAZINE [†]
chlorpro MAZINE [†]	chlordiaze POXIDE
CIS platin [†]	CARBO platin [†]
clo BAZ am	clonaze PAM
clonaze PAM	ALPRAZ olam — clo BAZ am — clo NID ine — clo ZAP ine — LOR azepam
clo NID ine	clonaze PAM — clo ZAP ine — Klon OPIN [‡]
clo ZAP ine	clonaze PAM — clo NID ine
cyclo PHOS phamide	cyclo SERINE [†] — cyclo SPORINE [†]
cyclo SERINE [†]	cyclo PHOS phamide — cyclo SPORINE [†]
cyclo SPORINE [†]	cyclo PHOS phamide — cyclo SERINE [†]
DACTIN omycin	DAPTO mycin
DAPTO mycin	DACTIN omycin
DEPO -Medrol [‡]	SOLU -Medrol [‡]
dex AMETH asone	dexmede TOMID ine
dexmede TOMID ine	dex AMETH asone
diaze PAM	dil TIAZ em
dil TIAZ em	diaze PAM
DOCE taxel	PACL itaxel
DOXO rubicin [†]	IDA rubicin
dron ABIN ol	dro PERID ol

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* These drugs have been discontinued and are not marketed in the United States.

† These drug names are also on the FDA list.

‡ Brand names always start with an uppercase letter. Some brand names incorporate tall man letters in initial characters and may not be readily recognized as brand names. A double dagger follows all brand names on the ISMP list.

FDA and ISMP Lists of Look-Alike Drug Names with Recommended Tall Man Letters

Table 2. ISMP List of Additional Drug Names with Tall Man (Mixed Case) Letters (continued from page 3)

Drug Name With Tall Man Letters	Confused With
dro P ERidol	dron A Binol
D ULoxetine	F LUoxetine — P ARoxetine
e P HEDrine	E PINE P Hrine
E PINE P Hrine	e P HEDrine
epi R UBicin	eri B ULin
eri B ULin	epi R UBicin
fenta N YL	A Lfentanil — S U F entanil
flavox A TE	fluvoxa M INE
F LUoxetine	D ULoxetine — P ARoxetine
flu P HENAZine	fluvoxa M INE
fluvoxa M INE	flavox A TE — flu P HENAZine
guai F ENesin	guan F ACINE
guan F ACINE	guai F ENesin
Huma L OG [‡]	Humu L IN [‡]
Humu L IN [‡]	Huma L OG [‡]
hydr A LAZINE [†]	hydro C HLO R Othiazide — hydro O X Y zine [†]
hydro C HLO R Othiazide	hydr A LAZINE [†] — hydr O X Y zine [†]
H YD R Ocodone	oxy C ODONE
H YD R Omorphone [†]	morphine — oxy M ORphone
H YD R OXYprogesterone	medroxy P ROG E STERone [†]
hydr O X Y zine [†]	hydr A LAZINE [†] — hydro C HLO R Othiazide
I D A rubicin	D O X O R ubicin [†] — idaru C IZU M ab
idaru C IZU M ab	I D A rubicin
in F LIXimab	ri T UXimab
I SOtretinoin	tretinoin
Klono P IN [‡]	clo N IDine
La M ICtal [‡]	Lam I SIL [‡]
Lam I SIL [‡]	La M ICtal [‡]
lami V UDine	lamo T RIGine
lamo T RIGine	lami V UDine
lev E TIRAcetam	lev O C A RN I tine — levo F LOXacin
lev O C A RN I tine	lev E TIRAcetam
levo F LOXacin	lev E TIRAcetam
L EVOleucovorin	leucovorin
L ORazepam	A LP R AZolam — clonaze P AM
medroxy P ROG E STERone [†]	H YD R OXYprogesterone
met F ORMIN	metro N IDA Z OLE

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Table 2. ISMP List of Additional Drug Names with Tall Man (Mixed Case) Letters (continued from page 4)

Drug Name With Tall Man Letters	Confused With
methazol AMIDE	meth IMA zole — met OL azone
meth IMA zole	methazol AMIDE — met OL azone
met OL azone	methazol AMIDE — meth IMA zole
metro NIDAZOLE	met FORMIN
metyra PONE	metyro SINE
metyro SINE	metyra PONE
mi FEPRIS tone	mi SOPROStol
mig AL stat [†]	mig LU stat [†]
mig LU stat [†]	mig AL stat [†]
mi SOPROStol	mi FEPRIS tone
mito MY cin	mito XANTRONE [‡]
mito XANTRONE [‡]	mito MY cin
Nex AVAR [‡]	Nex IUM [‡]
Nex IUM [‡]	Nex AVAR [‡]
ni CARD ipine [†]	NIFE dipine [†] — ni MOD ipine
NIFE dipine [†]	ni CARD ipine [†] — ni MOD ipine
ni MOD ipine	ni CARD ipine [†] — NIFE dipine [†]
Novo LIN [‡]	Novo LOG [‡]
Novo LOG [‡]	Novo LIN [‡]
OLAN Zapine	QU etiapine
OX carbazepine	car BAM azepine
oxy BUTY nin	oxy CODONE — Oxy CONTIN [‡] — oxy MOR phone
oxy CODONE	HYDRO codone — oxy BUTY nin — Oxy CONTIN [‡] — oxy MOR phone
Oxy CONTIN [‡]	oxy BUTY nin — oxy CODONE — oxy MOR phone
oxy MOR phone	HYDRO morphone [†] — oxy BUTY nin — oxy CODONE — Oxy CONTIN [‡]
PA clitaxel	DO cetaxel
PAR oxetine	DUL oxetine — FLU oxetine
PAZOP anib	PONAT inib
PEME trexed	PRALAT rexate
penicill AMINE	penicillin
PENT obarbital	PHEN obarbital
PHEN obarbital	PENT obarbital
PHYS ostigmine	py RID ostigmine
PONAT inib	PAZOP anib
PRALAT rexate	PEME trexed
Pri LOSEC [‡]	PRO zac [‡]
PRO zac [‡]	Pri LOSEC [‡]

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Table 2. ISMP List of Additional Drug Names with Tall Man (Mixed Case) Letters (continued from page 5)

Drug Name With Tall Man Letters	Confused With
py RID ostigmine	PHYS ostigmine
QU Etiapine	OLAN Zapine
qui NID ine	qui NINE
qui NINE	qui NID ine
RAB eprazole	ARI Piprazole
ra NITID ine*	ri MANTAD ine
rif AMP in	rif AXIM in
rif AXIM in	rif AMP in
ri MANTAD ine	ra NITID ine*
Risper DAL †	ROPINIR ole†
risperi DONE †	ROPINIR ole†
ri TUX imab	in FLIX imab
romi DEPS in	romi PLOST im
romi PLOST im	romi DEPS in
ROPINIR ole†	Risper DAL † — risperi DONE †
ROP ivacaine	BU Pivacaine
Sand IMMUNE ‡	Sando STATIN ‡
Sando STATIN ‡	Sand IMMUNE ‡
s AX agliptin	SIT agliptin
SIT agliptin	s AX agliptin — SUMAT riptan
Solu- CORTEF ‡	SOLU -Medrol‡
SOLU -Medrol‡	DEPO -Medrol‡ — Solu- CORTEF ‡
SORAF enib	SUN itinib
SUF entanil	AL fentanil — fenta NYL
sulf ADIAZINE †	sulf SALAZ ine
sulf SALAZ ine	sulf ADIAZINE †
SUMAT riptan	SIT agliptin — ZOLM itriptan
SUN itinib	SORAF enib
tia GAB ine	ti ZAN idine
ti ZAN idine	tia GAB ine
tra MAD ol†	tra ZOD one†
tra ZOD one†	tra MAD ol†
val ACY clovir	val GANC iclovir
val GANC iclovir	val ACY clovir
ZOLM itriptan	SUMAT riptan
Zy PREXA †	Zyr TEC †
Zyr TEC †	Zy PREXA †

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References

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