FUNZIONI CLINICO-ASSISTENZIALI DEL FARMACISTA: SCENARI APPLICATIVI

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REVIEW ARTICLE

Clinical Pharmacists and Inpatient Medical Care

A Systematic Review

Our review supports the use of clinical pharmacists in the inpatient setting to improve the quality, safety, and efficiency of care.

Kaboli PJ et al., Arch Intern Med. 2006;166:955-964

Major Selected Outcomes Reported	Results
Patient Care Unit Pharmacist Participation on Rounds	
Intervention group	
ADEs, pre vs post, No.	33.0-11.6 per 1000 patient-days $P<.001$
Preventable ADEs, pre vs post, No.	10.4-3.5 per 1000 patient-days; $P<.001$
Control group	
ADEs, pre vs post, No.	34.7 vs 46.6 per 1000 patient-days; $P<.76$
Preventable ADEs, pre vs post, No.	10.9 vs 12.4 per 1000 patient-days, $P<.001$

Leape LL,, et al.. *JAMA* 1999;282:267-270.

Tabella 1

	Harvard Medical Practice Study	*To err is Human*	*Australia*	*New Zealand*	*UK*
Eventi avversi	3.7%	4%	16.6%	12.9%	10,8%
Eventi avversi prevenibili (sul totale degli AE)	58%	53%	53%	35%	47%
Mortalità (sul totale degli AE)	13.6%	6.6%	4.9%	<15%	8%
Spesa Miliardi/anno	---	$37.6 AE $17 prevenibili	$4.7	---	£1 per aumento giorni di degenza
Fonte	Leape et al.; New Engl J Med; 1991; 370-84	Kohn et al.;1999; Institute Of Medicine	Wilson et al.; Med J Aust; 1995; 163: 158-71	Davis et al.; 2001;Ministry of Health	Vincent et al.; BMJ; 2001; 322: 517-19

ERRORE NELL'USO DEI FARMACI	- Errori di prescrizione - Errori di preparazione - Errori di trascrizione - Errori di distribuzione - Errori di somministrazione - Errori di monitoraggio

Prescribing errors

905/289.411 medication errors

3,13/1000 overall detected rate

522 potential for adverse consequences

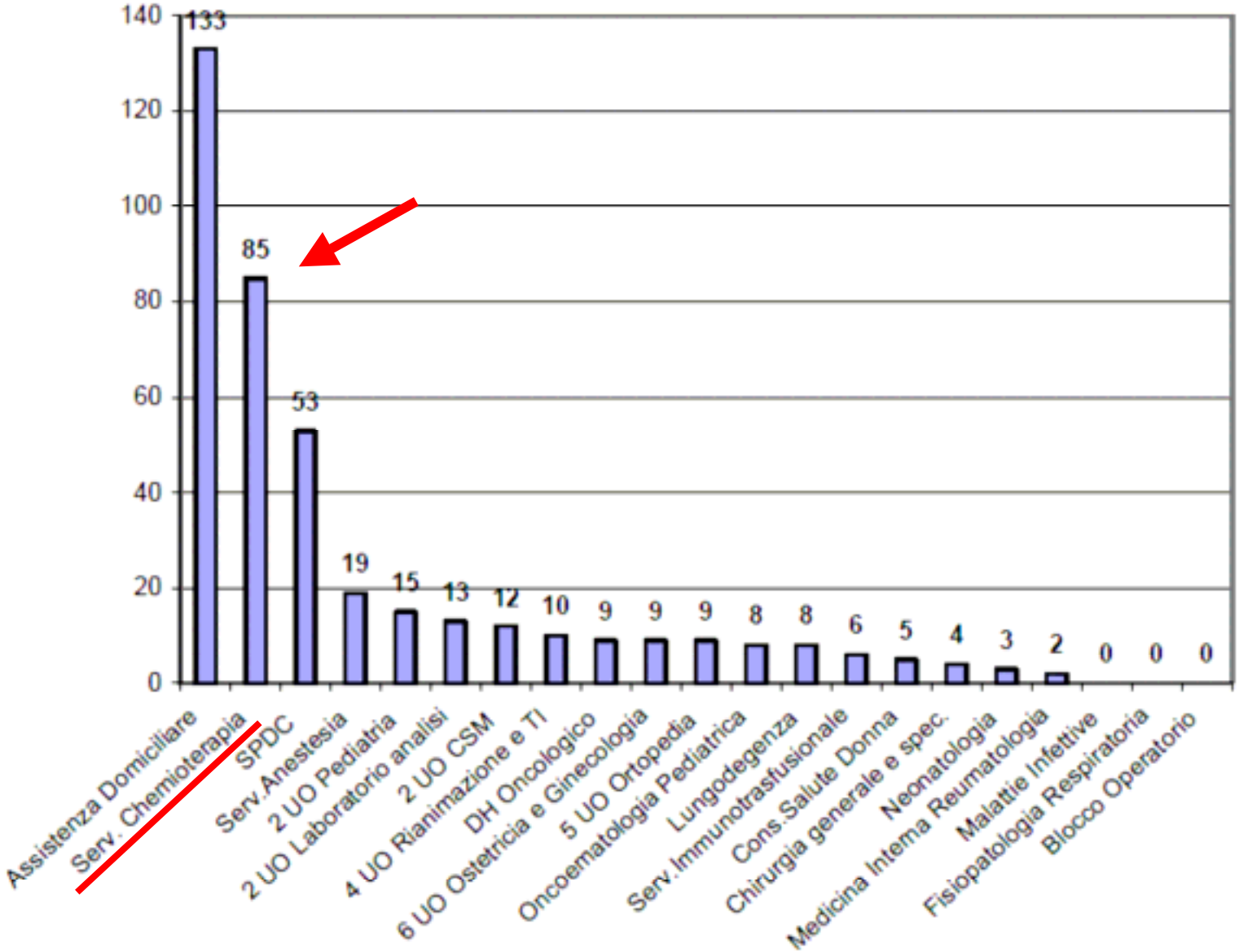
1,81/1000 (significant errors)

Lesar TS et al., JAMA 1990; 263:2329-23

Prescribing errors

TIPO DI ERRORE	N	%
Overdose	291	41,81
Sottodosaggio	115	16,52
Allergia	90	12,93
Forma farmaceutica	81	11,63
Farmaco sbagliato	35	5,03
Farmaco duplicato	35	5,03
Via di somministrazione	23	3,31
Paziente sbagliato	3	0,43
Altro	23	3,31
Totale	**696**	

Lesar TS et al., Arch Intern Med 1997; 157:1569-1576



Azienda Sanitaria Regionale, Dossier 86-2003, Regione Emilia Romagna

Medication errors in a neonatal intensive care unit. Influence of observation on the error rate

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Keywords
Hawthorne effect, Medication errors, Neonates, Patient safety, Pediatrics

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Abstract

Aim: To study if medication error rate decreased as a consequence of a simple observation process of registering its occurrence.

Methods: Prescription and transcription processes were prospectively registered along two different period of time in a level III regional Neonatal Intensive Care Unit: a pilot phase, aimed to know the baseline drug error rate and a phase I, a pre-intervention phase, both part of a study designed to determinate the effect of a preventive strategy in drug error rate. Random drug prescriptions by physicians and their transcriptions by nurses were reviewed and registered by a hospital pharmacist. A drug error episode was registered if dosage, units, route and administration interval were incorrect, illegible or not indicated.

Results: A significant reduction in the prescription error rate from 32.8% in the pilot phase to 19.2 % in the pre-intervention study phase was observed ($p < 0.001$). Rates of incorrect dosing (13.6% vs. 5%) and lack of dose specification in the medical prescriptions (3.3% vs. 0.5%) dropped significantly but transcription errors did not.

Conclusion: The presence of a person reviewing and registering the drug records apparently had by itself a substantial positive effect on the overall drug error rate. This phenomenon known as the Hawthorne effect should be taken in consideration when evaluating the efficacy of any preventive intervention aimed at improving patient safety

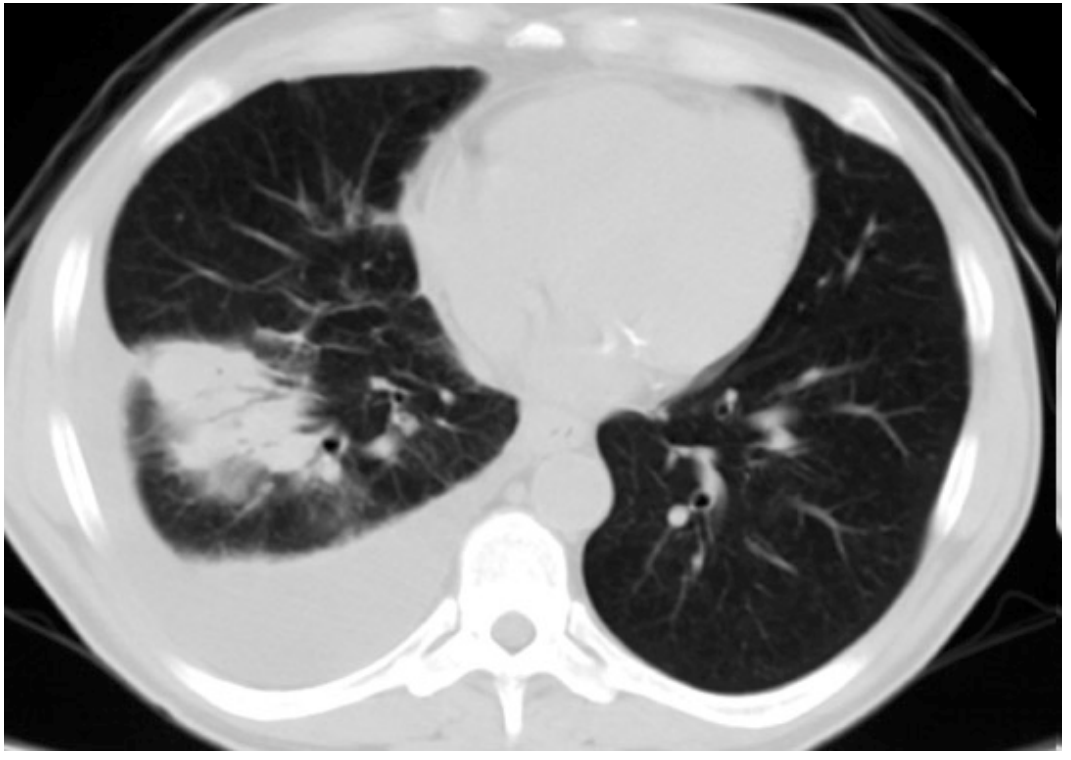
Pædiatrica/*Acta Pædiatrica* 2008 97, pp. 1589–159

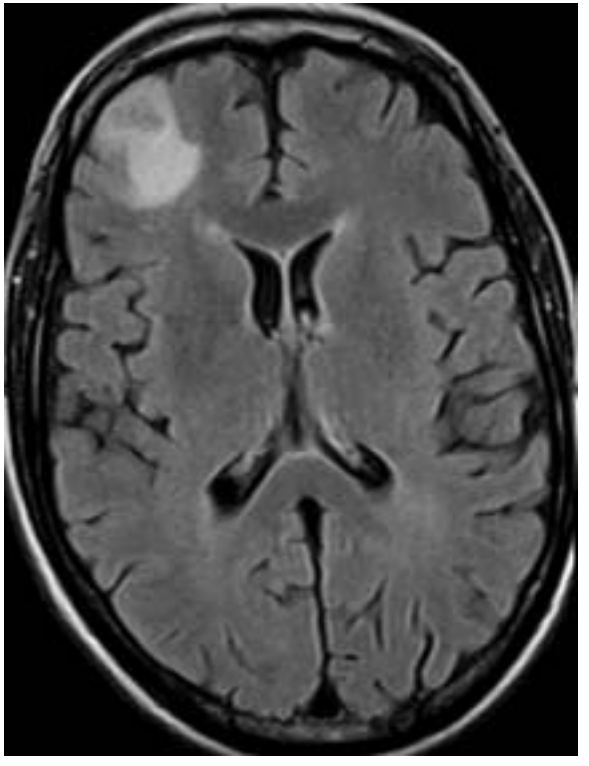
Table 1 Prescription error rates: pilot versus the pre-intervention phase

	Prescription					
Study's phase	Pilo (n = 122)t		Pre-intervention (n = 4,182)		Test	
Evaluation criteria	N	%	N	%	χ2 value	p-value
Dose not registered	4	3.3	21	0.5	7.823	0.005 (*)
Incorrect dose	16	13.6	209	5.0	0.76	<0.001 (*)
Units not registered	2	1.6	27	0.6	1.262	NS
Incorrect units	2	1.7	22	0.5	1.792	NS
Interval not registered	3	2.5	30	0.7	3.035	NS
Incorrect interval	—	—	1	0.0	0.057	NS
Route not registered	16	13.1	557	13.3	0.004	NS
Incorrect route	—	—	1	0.0	0.058	NS

Pædiatrica/*Acta Pædiatrica* 2008 97, pp. 1589–159

B.P., male with pulmonary and cerebral nocardiosis





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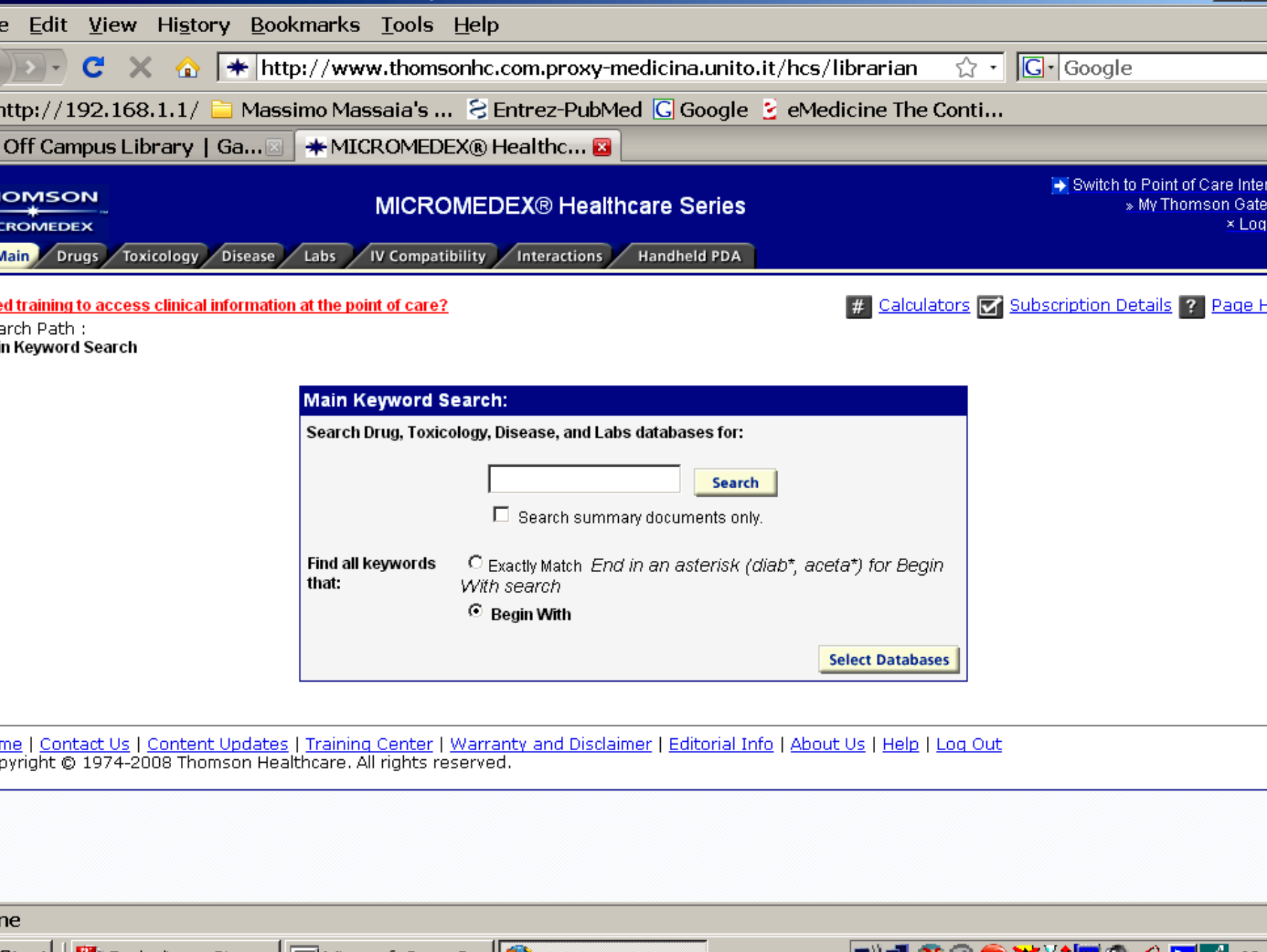
Cognome [redacted] Letto n°____

	FARMACI e via di somministrazione		DATA anno 08 mese APRI	giorni 16/4	17/4	18/4	19/4	20/4	21/4	22/4
IDRATAZIONE	Sacco fisiologico 2000 cc	cc/h		80	80	80	80	80	80	80
	MgSO4 fl/sacco			2	2	2	2	2	2	2
	NaCl fl/sacco			4	4	4	4	4	4	4
	Elettrolitica 500 ml	cc/h		40	40	40	40	40	40	
	Ca gluconato fl ev/die			4x3	4x3	4x3	4x3	4x3	4x3	4x3
	+ KCl mEq/sacco			60	90	120	120	90	90	60
CHEMIOTERAPIA	Prograf mg/die			1x2	1x2	1x2	1x2	1x2	1x2	1x2
	Entocir 6 mg cp/die			x1	x1	x1	x1	x1	x1	x1
	Sanifolin fl ev			x1	x1	x1	x1	x1	x1	x1
ANTIBIOTICI e altro	Meronem g ev/die			2x3	2x3	2x3	2x3	—	—	2x3
	Zovirax mg ev/die			500 x3	500 x3					
	Bactrim fl ev/die			4x3	4x3		4x3	—	—	4x3
	Zovirex 400 mg cp/die / Zeldita 400 mg					1x3	x1	—	—	x1
	Ambisome mg ev/die			200	200	200	200	—	—	200
	Pariet 20 mg cp/die				1	x1	x1	—	—	x1
	Pfizer 1 fl AB									
	Seropram gtt/die			V	V	V	V	—	—	V
TERAPIA ORALE e farmaci al bisogno	Nepal fl ev/die			1x2						
	Deniban cp/die			x1	x1	x1	x1	—	—	x1
	Contramal 1 fl AB									
	Keppra mg/die			500 x2	500 x2	500 x2	500 x2	—	—	500 x2
	Depakin mg/die			500 x2	400 x3	400 x3	400 x3	—	—	400 x3
	Fortimel flac/die			V	V	V	V	x2	x2	V x2
	Selepressina g/die			0.6	0.6	0.6	0.6	—	—	0.6

Nome [redacted] Letto

DAL..... AL.....	17/4	18/4	19/4	20/4	21/4	22/4	23/4	24/4	25/4	26/4	27/4	28/4	29/4
Glicemia	84	93	92	88	90	79	90	84	86	88	91	84	86
Azotemia	14	12	12	9	11	12	15	12	17	23	18	19	18
Creatininemia	0.39	0.64	063	063	0.48	0.52	0.64	0.63	0.59	0.6	075	0.70	0.63
Acido urico	1.2				1.6			1.9				1.8	
Proteine totali	5.2				5.7			5.5				5.8	
Albumina	2.7				3.0			3.0				3.0	
Bilirubina totale	0.4	0.4	04	03	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
" diretta	0				0.3			0				0.9	
" diretta	0.4				0.0			0.3				-0.6	
AST	14	19	17	18	17	19	17	16	16	19	22	25	24
ALT	20	22	23	24	23	20	21	19	20	16	21	22	23
Gamma GT	48	49	51	56	55	55	56	51	46	45	51	54	51
ALP	74	65			79	76	78	75	73	74	80	80	81
LDH	300	284	310	347	337	319	346	304		297	305	304	313
Amilasi	35				45	49		49				52	53
Na	138	139	136	135	134	133	132	133	133	135	133	132	135
K	3.2	3.3	4.1	4.7	4.9	5.1	4.7	4.5	4.5	4.2	4.1	4.1	4.2
Cloro	102				101					100	106	103	
Calcio	2.12			1.21	2.31								
Fosfato	0.48				0.75		1.08	1.05				0.94	
Magnesio	0.74				0.77		0.79	0.81					
Colesterolo													
Trigliceridi		(V)											V
EGA (V/A) pH		7.47			7.42						7,41		7.34
Pa O2		51			53						40		
PaCO2		43			44						46		
CO2 tot													
HCO3		31			27.4						29		
BE		6.8			3.5						3.8		
Clear. Urea													
Clear. Creat.													
Ca++		1.12			1.27						1,2		1.18
ac. Lattico					2.5								
ac. valproico					5.0								
FK506						2.9		<1.2			1.8		<1.2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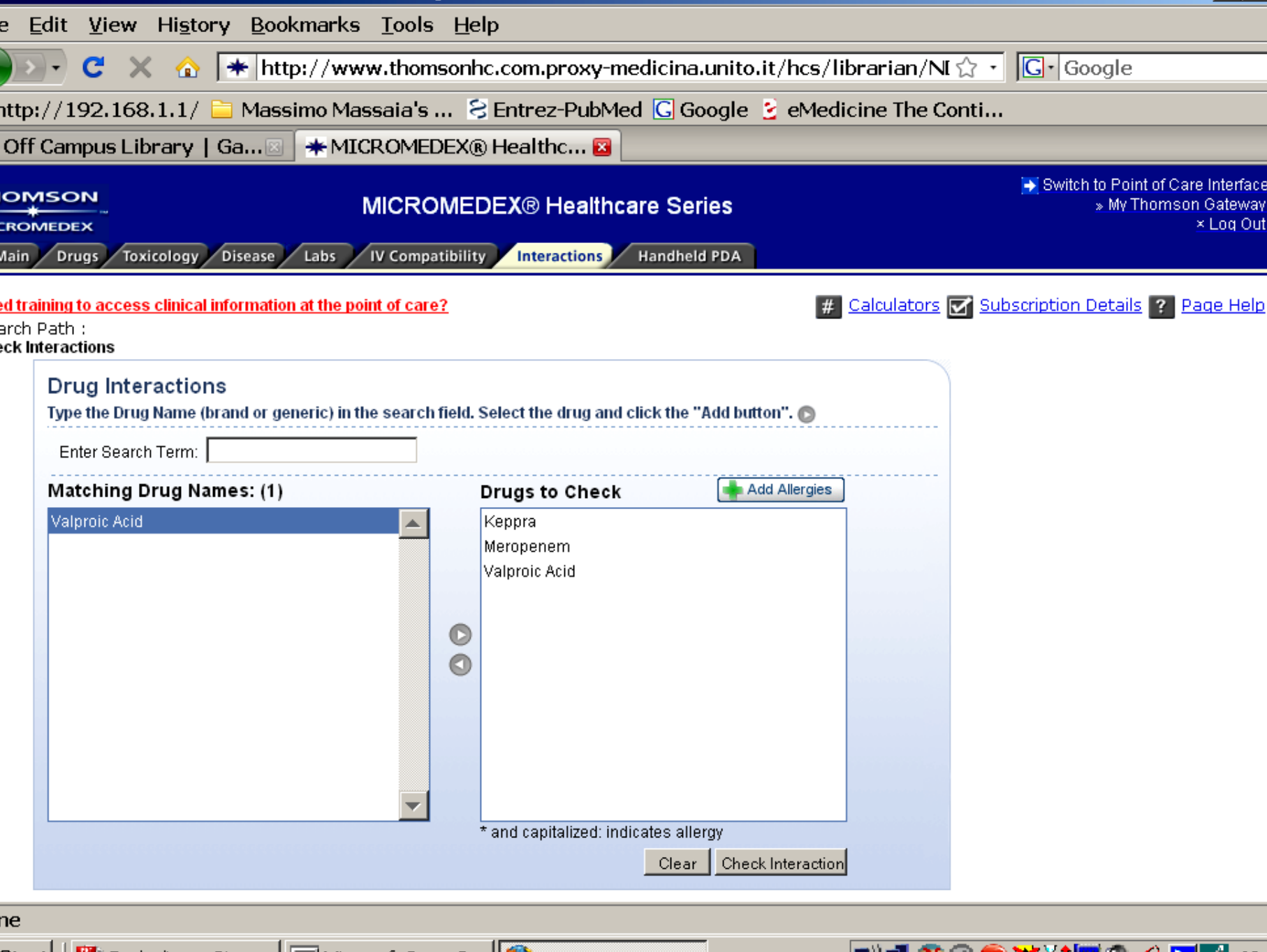
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Keppra
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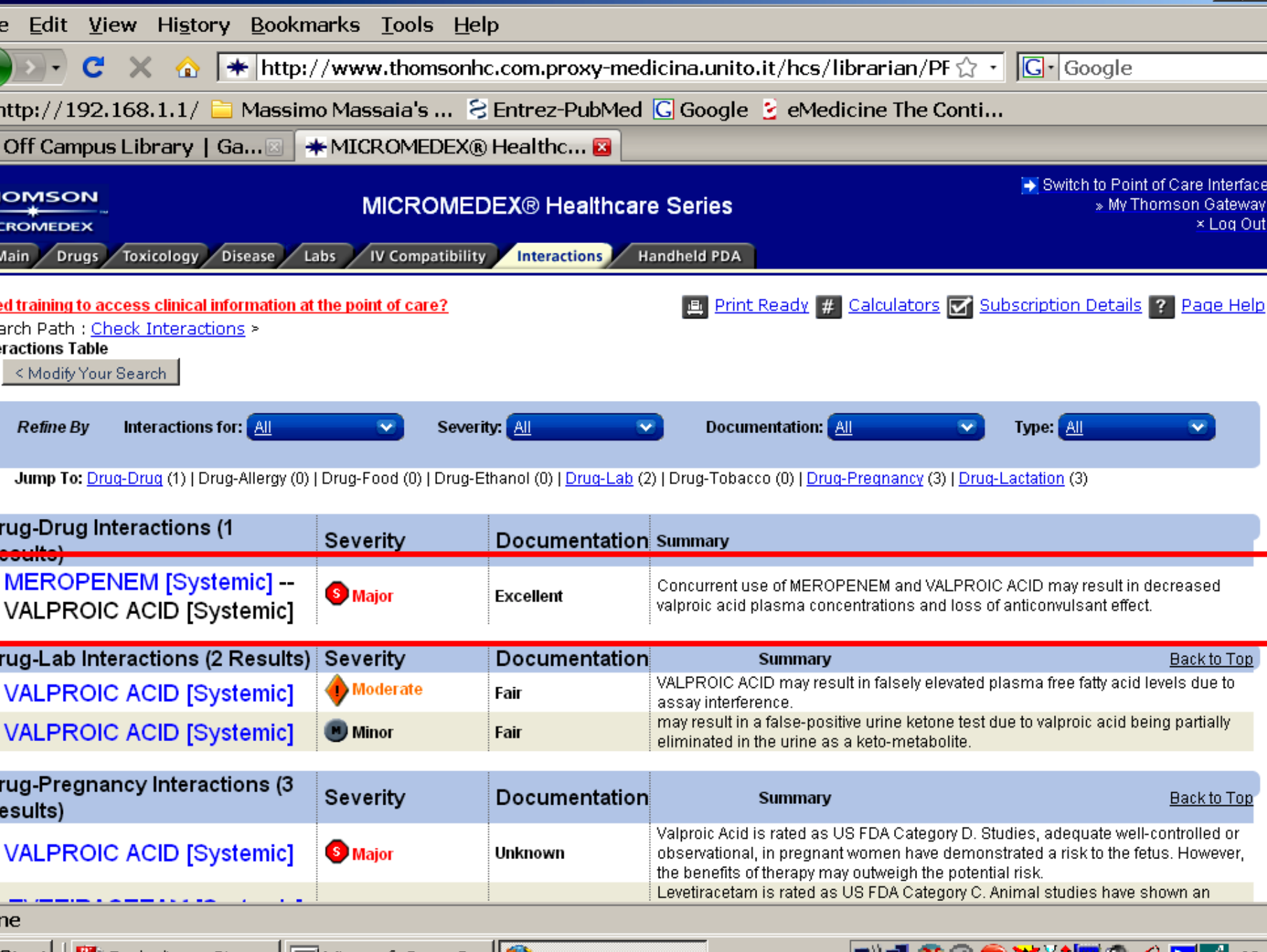
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Jump To: Drug-Drug (1) | Drug-Allergy (0) | Drug-Food (0) | Drug-Ethanol (0) | Drug-Lab (2) | Drug-Tobacco (0) | Drug-Pregnancy (3) | Drug-Lactation (3)
rug-Drug Interactions (1 esults)
Severity
Documentation
Summary
MEROPENEM [Systemic] -- VALPROIC ACID [Systemic]
Major
Excellent
Concurrent use of MEROPENEM and VALPROIC ACID may result in decreased valproic acid plasma concentrations and loss of anticonvulsant effect.
rug-Lab Interactions (2 Results)
Severity
Documentation
Summary
Back to Top
VALPROIC ACID [Systemic]
Moderate
Fair
VALPROIC ACID may result in falsely elevated plasma free fatty acid levels due to assay interference.
VALPROIC ACID [Systemic]
Minor
Fair
may result in a false-positive urine ketone test due to valproic acid being partially eliminated in the urine as a keto-metabolite.
rug-Pregnancy Interactions (3 esults)
Severity
Documentation
Summary
Back to Top
VALPROIC ACID [Systemic]
Major
Unknown
Valproic Acid is rated as US FDA Category D. Studies, adequate well-controlled or observational, in pregnant women have demonstrated a risk to the fetus. However, the benefits of therapy may outweigh the potential risk.
Levetiracetam is rated as US FDA Category C. Animal studies have shown an
ne

ERRORE NELL'USO DEI FARMACI	- Errori di prescrizione - Errori di preparazione - Errori di trascrizione - Errori di distribuzione - Errori di somministrazione - Errori di monitoraggio

(Usare una scrittura comprensibile)

Cognom[redacted] Letto n° ____

	FARMACI e via di somministrazione	DATA anno 2008, mese APR — giorni: 9	10	11	12	13	14	15/4
IDRATAZIONE	Sacca Fisiologica 2000 cc	120	120	120	120	120	120	[illegible]
	KCl mEq/sacca	40						
	MgSO4 fl/sacca	2	2	2	2	2	2	2
	NaCl fl/sacca	6	6	6	6	6	6	6
	Elettrolitica 500 ml (ml/h)							40
	Mannitolo 18% 125 cc	x5	x5	x5	x5	x5	x5	x5
	Ca gluconato fl ev/die	3x3	4x3	4x3	4x3	4x3	4x3	4x3
	Tiamina fl ev/die	1	1	1	1	1	1	x1
CHEMIOTERAPIA	Prograf mg/die	1x2	1x2	1x2	1x2	1x2	1x2	1x2
	Entocir 6 mg cp/die	6	6	6	6	6	6	x1
	Bonfolin [illegible]							x1
ANTIBIOTICI e altro	Merrem gr ev/die	2x3	2x3	2x3	2x3	2x3	2x3	2x3
	Zovirax mg ev/die	500 x3	500 x3	500 x3	500 x3	500 x3	500 x3	500 x3
	Bactrim fl ev/die	4x3	4x3	4x3	4x3	4x3	4x3	4x3
	Zyvoxid mg ev/die	600 x2	600 x2	600 x2	600 x2	600 x2	600 x2	600 x2
	Ambisome mg ev/die	200	200	200	200	200	200	200
	Plasil 1 fl AB							
	Peptazol gtt/die	V	V	V	V	V	V	V
ORALE e farmaci al bisogno	Mepral fl ev/die	1x2	1x2	1x2	1x2	1x2	1x2	1x2
	Deursil cp/die	1	1	1	1	1	1	x1
	Catapresan 1 fl AB	V	V					
	Keppra mg/die	500 x2	500 x2	500 x2	500 x2	500 x2	500 x2	500 x2
	Depakin mg/die	250 x3	250 x3	250 x3	500 x2	500 x2	500 x2	500 x2
	[illegible] fl/cp/die	2	2	2	2	2	1x3	1x3

Cognome ... [redacted] ... APRILE N° Letto 1

ORA	TERAPIA ENDOVENOSA	SOSP. IL	11	12	13	14	15	16	17	18	19	20
~~6~~	~~MANNITOLO 18% 125 ml a 300 cc/h~~	15/4	si	DB			SB					
8	Ca Gluc. 4 fl in 250 cc SF		si	MW	hmg	EM	SB	stud I.G	EjTe			
8	MERREM 2 gr in 100 cc SF		si	MW	hmg	EM	SB	stud I.G	EjTe			
8	ZOVIRAX 500 mg in 100 cc SF		si	MW	hmg	EM	SB	stud I.G	EjTe			
8	~~MEPRAL 1 fl a bolo~~	17/4	~~si~~	~~MW~~	hmg	EM	SB	stud I.G	EjTe			
8	BACTRIM 4 fl in Gluc. 5% 500 cc		si	MW	hmg	EM	SB	stud I.G	EjTe			
~~8~~	~~ZYVOXID 600 mg~~	15/04	si	MW	hmg	EM	SB					
~~11~~	~~MANNITOLO 18% 125 ml a 300 cc/h~~	15/4	ce	MW	EM		SB					
~~16~~	~~TIAMINA 1 fl in 100 cc SF~~	15/04	EjTe	Tru	EjTe	Ro						
16	Ca Gluc. 4 fl in 250 cc SF		EjTe	Tru	EjTe	Ro	Ro	stud FR				
16	MERREM 2 gr in 100 cc SF		EjTe	Tru	EjTe	Ro	Ro	stud FR				
16	ZOVIRAX 500 mg in 100 cc SF		EjTe	Tru	EjTe	Ro	Ro	stud FR				
16	BACTRIM 4 fl in Gluc 5% 500 cc		EjTe	Tru	EjTe	Ro	Ro	stud FR				
~~16~~	~~MANNITOLO 18% 125 ml a 300 cc/h~~	15/4	EjTe	Tru	EjTe	Ro	Ro					
~~20~~	~~MEPRAL 1 fl a bolo~~	17/4	EjTe	Tru	EjTe	Ro	Ro	stud FR				
~~20~~	~~ZYVOXID 600 mg~~	15/04	EjTe	Tru	EjTe	Ro						
~~20~~	~~MANNITOLO 18% 125 ml a 300 cc/h~~	15/4	EjTe	Tru	EjTe	Ro	Ro					
24	AMBISOME 200 mg in Gluc. 5%		Ro	DB	FG	hmg	S	stud FR	Ro			
24	Ca Gluc. 4 fl in 250 cc SF		Ro	DB	FG	hmg	S	FR	Ro			
24	MERREM 2 gr in 100 cc SF		Ro	DB	FG	hmg	S	FR	Ro			
24	ZOVIRAX 500 mg in 100 cc SF		Ro	DB	FG	hmg	S	FR	Ro			
24	BACTRIM 4 fl in Gluc. 5% 500 cc		Ro	DB	FG	hmg	S	FR	Ro			
~~01~~	~~MANNITOLO 18% 125 ml a 300 cc/h~~	15/4	Ro	DB	FG	hmg						
2:00	SANIFOLIN 1 fl					→	S	FR	Ro			

Cognom[redacted] Letto 1 Mese 04

Ora	Farmaci	Sosp. il	14	15	16	17	18	19	20
8	PROGRAF 1mg		cc	cc	cc	cc	BD	DB	DB
8	ENTOCIR 6mg		cc	cc	cc	cc	BD	DB	DB
8	DENIBAN 1CO		cc	cc	cc	cc	BD	DB	DB
8	KEPPRA 500mg 1CO		cc	cc	cc	cc	BD	DB	DB
8	DEPAKIN ~~500mg~~ 400 MG		cc	cc	cc	cc	BD	DB	DB
8	FORTIMEL 1 flac		[illegible]	[illegible]	[illegible]	MW	ET	[illegible]	[illegible]
800	PARIET 1 CO				→		BD	DB	DB
~~8~~	~~ZOVIRAX 400 mg~~								
16	SELEPARINA 0,6 1 fl S.C.		MR	MR	BL	GT	MR	MR	cc
~~16~~	~~FORTIMEL 1 flac~~	19/04 →	MR	MR	BL	GT	MR		
1600	DEPAKIN 400 MG				→	GT	MR	MR	cc
~~16~~	~~ZOVIRAX 400 mg~~								
16	ZELITREX 1 ~~cpr~~ fl CO					→	MR	MR	cc
20	PROGRAF 1mg		MR	MR	BL	GT	MR	MR	cc
20	KEPPRA 500 mg		MR	MR	BL	GT	MR	MR	cc
~~20~~	~~DEPAKIN 500mg~~	~~17/4~~	MR	MR	BL				
20	FORTIMEL 1 flac		MR	MR	BL	GT	MR	MR	cc
2200	DEPAKIN 400 mg				→	GT	MR	MR	cc
22	SEROPRAM II gtt		MR	MR	BL		MR	MR	
~~22~~	~~ZOVIRAX 400 mg~~								

Note

Farmaci al bisogno

Table 2 Transcription error rates: pilot versus pre-intervention phase

	Transcription					
Study's phase	Pilot (n = 122)		Pre-intervention (n = 4,182)		Test	
Evaluation criteria	N°	%	N°	%	c2 value	p-value
Dose not registered	6	4.9	337	8.1	1.82	NS
Incorrect dose	—	—	10	0.3	0.595	NS
Units not registered	7	5.7	356	8.5	1.315	NS
Incorrect units	—	—	55	1.4	3.281	NS
Interval not registered	3	2.5	61	1.5	0.681	NS
Incorrect interval	—	—	3	0.1	0.171	NS
Route not registered	8	6.6	181	4.3	1.231	NS
Incorrect route	1	0.9	3	0.1	2.849	NS

Pædiatrica/*Acta Pædiatrica* 2008 97, pp. 1589–159

CHEMIOTERAPIA E RADIOTERAPIA

Cognome e nome: | Data nasc. | Letto | Peso | Altezza | Peso farm. | Sup. Corp. | 0

Allergie:

Data: | Data: | Data:

Firma medico per validazione terapia fino alle ore 08,00 del mattino successivo

SCHEMA CICLO:

IDRATAZIONE CICLO

1° VIA	Soccafleb c				
	KCl (mEq/sacca)				
	NaHCO3 (mEq/sacca)				
	NaCl (Fl sacca)				
	MgSo4 (Fl sacca)				
	ALTRO_____				
	ALTRO_____				
	VELOCITA' INFUSIONE (ml/h)				
	INIZIA/SOSTITUISCE (ORE)				
2° VIA	Soccafleb c				
	INTEGRAZIONE_____				
	INTEGRAZIONE_____				
	VELOCITA' INFUSIONE (ml/h)				
	INIZIA/SOSTITUISCE (ORE)				
	Firma medico che prescrive				
	Firma operatore che prepara				
	Firma operatore che somministra				

CHEMIO

FARMACO	Dose/Kg (mg/mg)	Dose (mg)	DILUIZIONE	V. INFUSIONE (ml/h)	ORA SOMMIN.	Firma Medico prescrittore	Firma Medico	GIORNO_____ FIRMA CONTROLLO	GIORNO_____ FIRMA SOMMINISTRAZIONE	GIORNO_____ FIRMA CONTROLLO	GIORNO_____ FIRMA SOMMINISTRAZIONE	GIORNO_____ FIRMA CONTROLLO	GIORNO_____ FIRMA SOMMINISTRAZIONE
						Firma	Firma						

TERAPIA SUPPORTO

Farmaco, dosaggio e forma (singola dose) x somm/die	Data Inizio	Firma Medico	__ 6 9 12 16 18 20 24	__ 6 9 12 16 18 20 24	__ 6 9 12 16 18 20 24
Firma operatore che somministra la terapia					

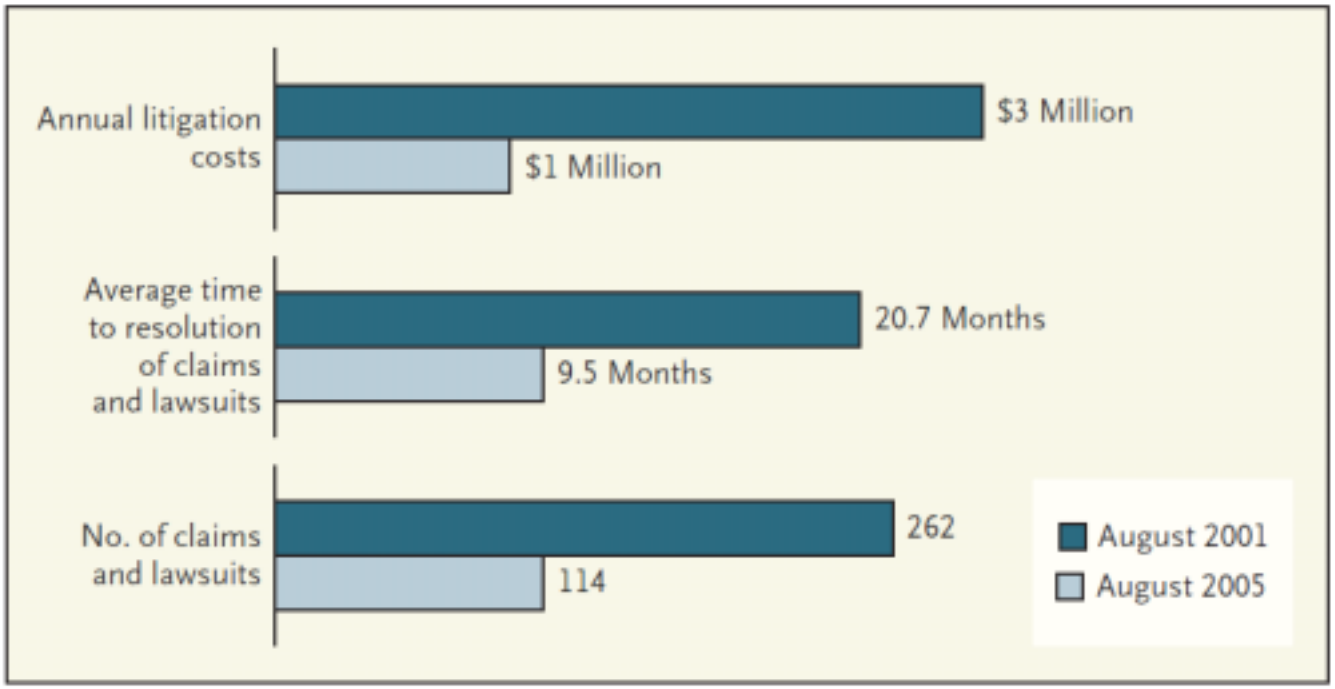
NOTE:

Short Description of Therapy

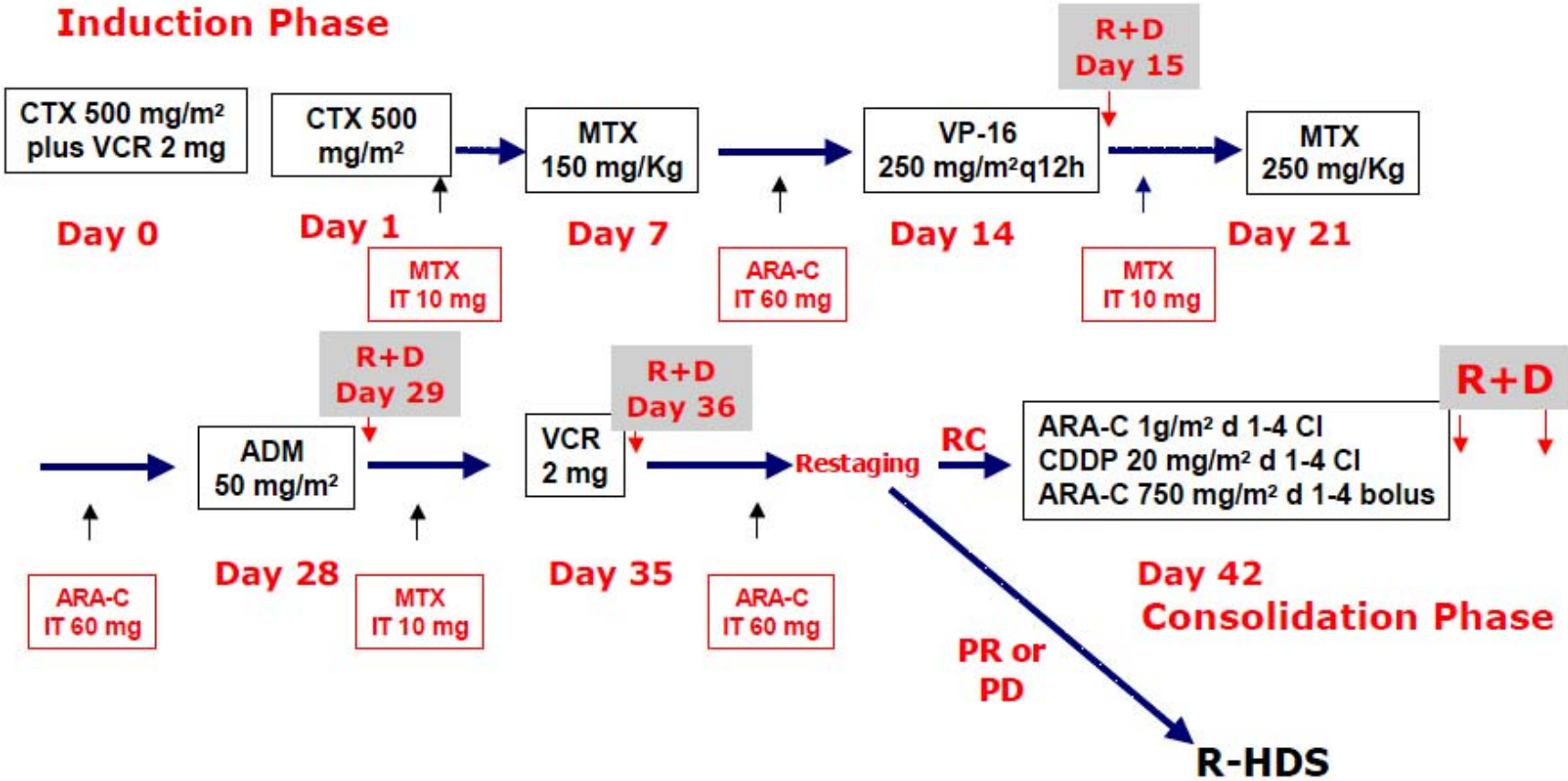
Uniform pre-phase, induction therapy and consolidation I for all risk groups				
Pre-phase (d 1-5)	Methotrexate	15 mg abs.	i.th.	d 1
	Dexamethasone	10 mg/m²	p.o. (divided to 3)	d 1-5
	Cyclophosphamide	200 mg/m²	c.i. (1 h)	d 3-5
Induction I (d 6-20)	Dexamethasone	10 mg/m²	p.o. (divided to 3)	d 6-7 and 13-16
	Vincristine	2 mg abs.	i.v. (Bolus)	d 6, 13, 20
	Daunorubicine	45 mg/m²	i.v. (15 min)	d 6+7, 13+14
	> 55 yrs	*30 mg/m²*		
	PEG-asparaginase	1000 U/m²	c.i. (2 h)	d 20
	> 55 yrs	*500 U/m²*		
	Pharmakokinetics			*d 20, 26, 32*
	G-CSF	5 µg/kg	s.c.	from d 6
	In patients with granulocytopenia < 500/µl at diagnosis			*from d 1*
Treatment in pts with granulocytopenia at diagnosis:	Patients with granulocytopenia < 500/µl (at diagnosis or d 1-5):			
	- If CR/PR at d 11: therapy starting from day 11 (DNR,VCR,DEXA) may be postponed until granulocytes have recovered > 500/µl (maximum 1 week)			
	- If failure/progression: therapy should be continued			
Remission controls				d 11 d 26 (MRD)

Making Patient Safety the Centerpiece of Medical Liability Reform

Hillary Rodham Clinton and Barack Obama

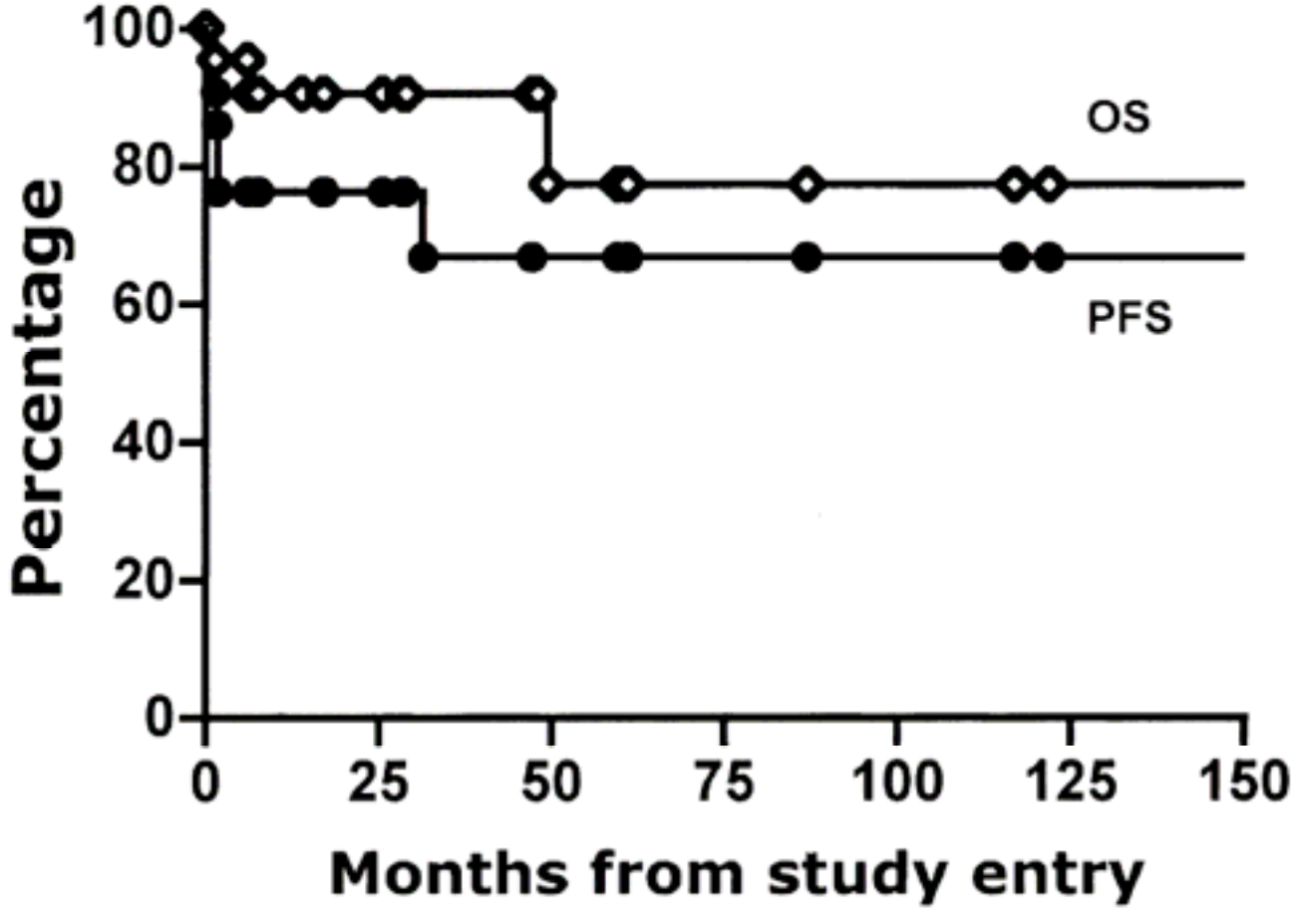


Results of Medical Error Disclosure Program at the University of Michigan Health System.



R+D: Rituximab 375 mg/m² plus Decadron 8 mg EV q12h

Di Nicola M et al., Br J Haematol. 2004 Sep;126(6):815-20



Di Nicola M et al., Br J Haematol. 2004 Sep;126(6):815-20

LINFOMA DI BURKITT DELL'ADULTO
- SCHEMA DI TRATTAMENTO -

Giorno 21

METHOTREXATE 250 mg/Kg

Paziente [redacted]
Cartella

sup corporea 1.66

Idratazione con ~~Sol III~~ SALF + 30 mEq/l KCl + 80 mEq/l NaHCO3 a 260 ml/h (4000 ml/mq/24 ore) dalle 24 del 7/4/08 (~~giorno 20~~); ai termine della infusione del MTX ridurre e proseguire idratazione a 200 ml/h (3000 ml/mq/24 ore).

DIAMOX 250 mg 1 cp PO ogni 6 ore dalle 6 del 8/4 (~~giorno 21~~)

ZOFRAN 8 mg ore 8 e ore 20

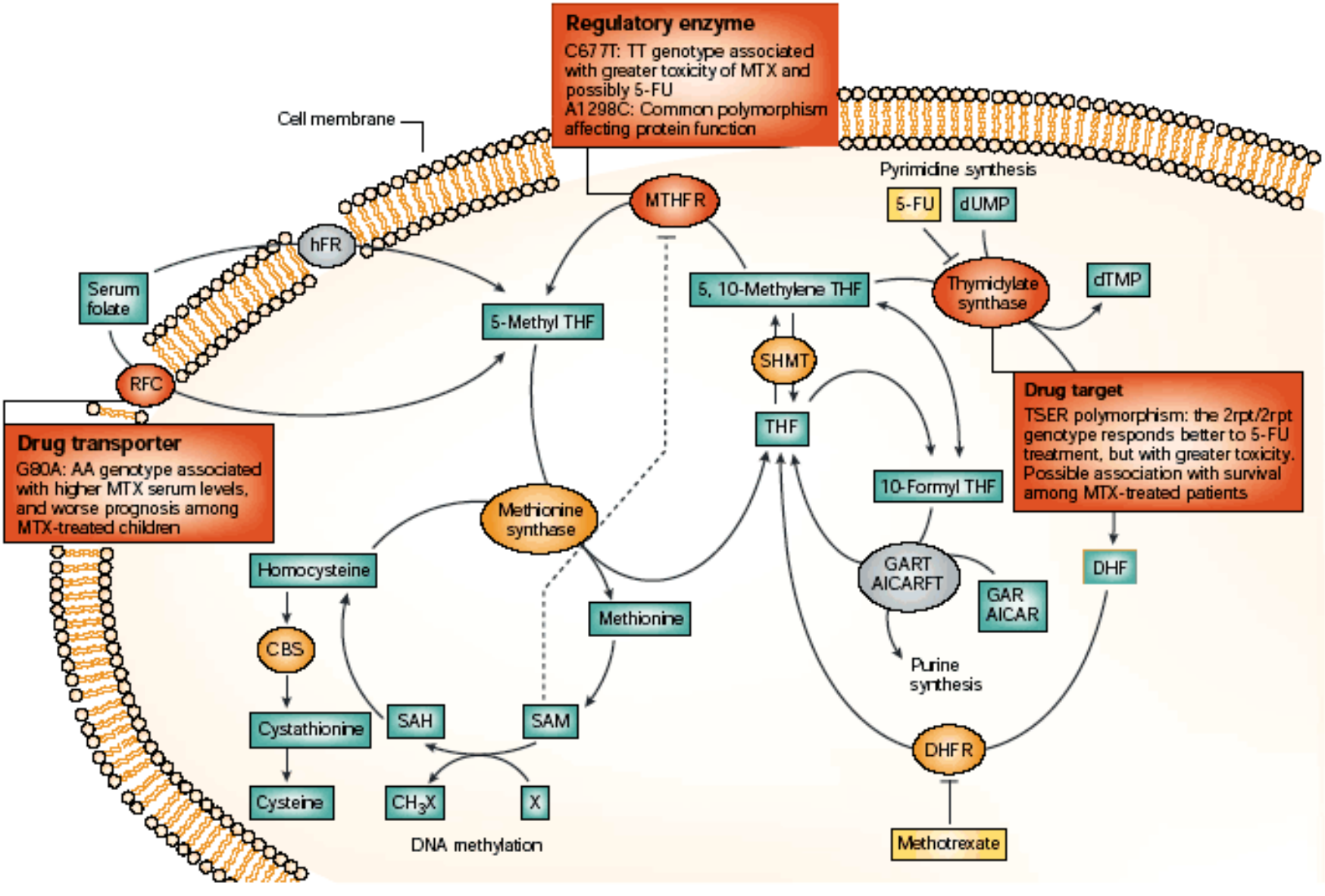
METHOTREXATE 14.5 grammi (250 mg/Kg) in 750 ml Sol Glucosata 5% a 125 ml/ora alle 10 del 8/4 (giorno 21)

LEDERFOLIN 1 fiala ~~mg (9 mg/mq)~~ ev bolo ogni 6 ore dalle ore 9 del 9/4 (~~giorno 22~~) fino alle ore 3 del giorno 12/4 (~~giorno 25~~) (dodici somministrazioni totali).

QUESTRAN 1 bustina PO ogni 6 ore dalle ore 9 del 9/4 (~~giorno 22~~) (quattro somministrazioni totali).

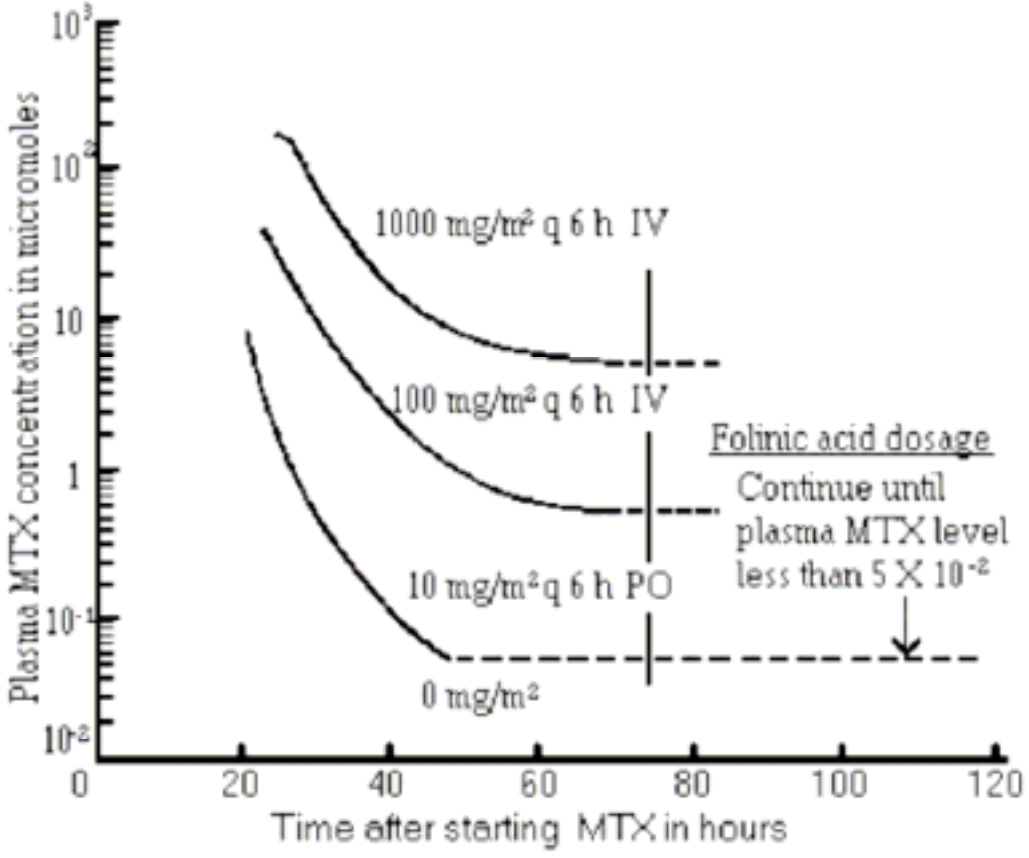
- Prelievo dosaggio MTX a 24 e 48 ore dall'inizio dell'infusione.
- Controllo pH e diuresi ogni 2 ore durante l'infusione del farmaco, avvisare il medico se urine <100 ml/ora e/o pH urinario < 7
- Se MTX a 48 ore > 5 x 10E-7 M, aumentare Lederfolin a 15 mg/mq ogni 6 ore
- Se MTX a 48 ore > 10E-6 M, aumentare Lederfolin a 90 mg/mq ogni 6 ore

BILANCIO ore 8, 15 e ore 20




METHOTREXATE
50 mg


LEUCOVORIN
CALCIUM
50 mg


Plasma MTX concentration in micromoles
10^3
10^2
10
1
10^{-1}
10^{-2}
1000 mg/m² q 6 h IV
100 mg/m² q 6 h IV
10 mg/m² q 6 h PO
0 mg/m²
Folinic acid dosage
Continue until plasma MTX level less than 5×10^{-2}
0
20
40
60
80
100
120
Time after starting MTX in hours

Methotrexate

Print this Page

Revised Aug 1, 2006

SYNONYM(S): Amethopterin, MTX

COMMON TRADE NAME(S): Rheumatrex®, Folex®(USA), Mexate®(USA)

CLASSIFICATION: Antimetabolite

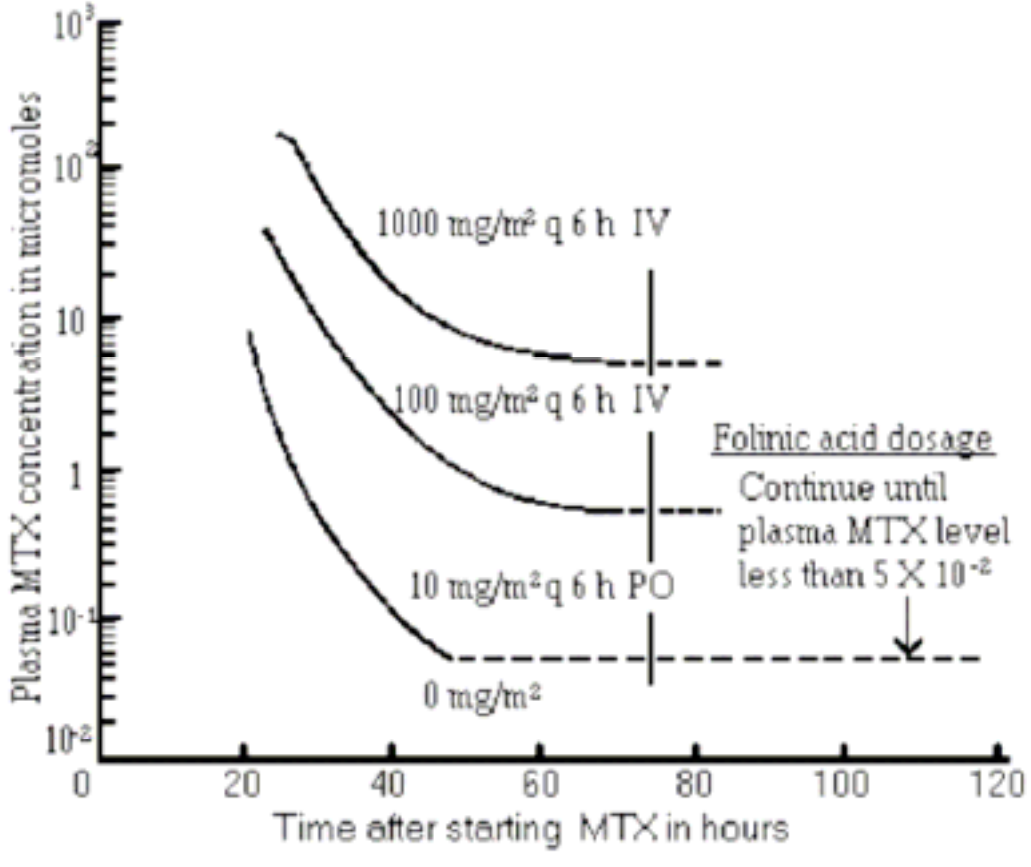
Special pediatric considerations are noted when applicable, otherwise adult provisions apply.

Methotrexate


METHOTREXATE
INJECTION USP
50 mg


LEUCOVORIN
CALCIUM
50 mg


NDC 0281-0365-10
Digoxin Immune
Fab (Ovine)
DigiFab®


Plasma MTX concentration in micromoles
10^3
10^2
10
1
10^{-1}
10^{-2}
1000 mg/m² q 6 h IV
100 mg/m² q 6 h IV
10 mg/m² q 6 h PO
0 mg/m²
Folinic acid dosage
Continue until
plasma MTX level
less than 5 X 10^{-2}
0
20
40
60
80
100
120
Time after starting MTX in hours

(2)

.....

(Intestazione e timbro Azienda Ospedaliera)

Data .....

OGGETTO: Richiesta di importazione di un farmaco non registrato in Italia da utilizzarsi in ambito ospedaliero ed inserito, ai sensi dell'art.1, comma 4, del decreto-legge 21 ottobre 1996, n.536, convertito, dalla legge 23 dicembre 1996, n.648, nell'elenco istituito con provvedimento della Commissione unica del farmaco.

Il sottoscritto medico Dott.....
Operante presso il Reparto/Divisione di .....

Chiede di poter importare tramite la Ditta Protherics UK Limited

Principio attivo:	Glucarpidase, formalmente Carboxypeptidase G2
Nome commerciale:	VORAXAZE ™
Forma farmaceutica:	polvere per soluzione iniettabile 1000 UI / 1 fiala
Confezione da :	02 fiale
Dosaggio:	vedi Tab.1 foglio illustrativo allegato
Posologia prescritta:	vedi Tab.1 foglio illustrativo allegato
nella quantità di:	n° ..... confezioni
Prodotto dalla ditta:	Protherics UK Limited

Titolare dell'Autorizzazione all'immissione in commercio: Protherics UK Limited
Il farmaco è in processo di registrazione EMEA nel Paese di provenienza.
Indicazione terapeutica/diagnostica: trattamento di pazienti con tossicità da metotressato o a rischio di sviluppo di tossicità da metotressato.

Tale farmaco è indispensabile ed insostituibile a scopo diagnostico/terapeutico per il trattamento di circa n° ..... pazienti non ancora individuati e si richiede che sia già disponibile in reparto (per casi di emergenza) al momento del ricovero del/dei pazienti selezionati per questa terapia. In tal caso, prima del trattamento, sarà acquisito e conservato agli atti nella cartella clinica il consenso informato di ciascun paziente.

DICHIARA ALTRESI' CHE IL FARMACO:

- non è sostituibile con altri farmaci registrati in Italia
- non contiene sostanze stupefacenti o psicotrope, non è sangue umano e/o suoi derivati
- verrà impiegato sotto la sua diretta responsabilità , dopo aver ottenuto il consenso informato dai pazienti o, in caso di minori o incapaci, di chi esercita la patria potestà.

Dichiara inoltre che le generalità del paziente e i documenti relativi al consenso informato saranno in possesso dello scrivente medico curante.

.....
Il Medico Curante
(firma per esteso e timbro leggibile)

.....
Il Dirigente del Servizio Farmaceutico
(firma per esteso e timbro leggibile)

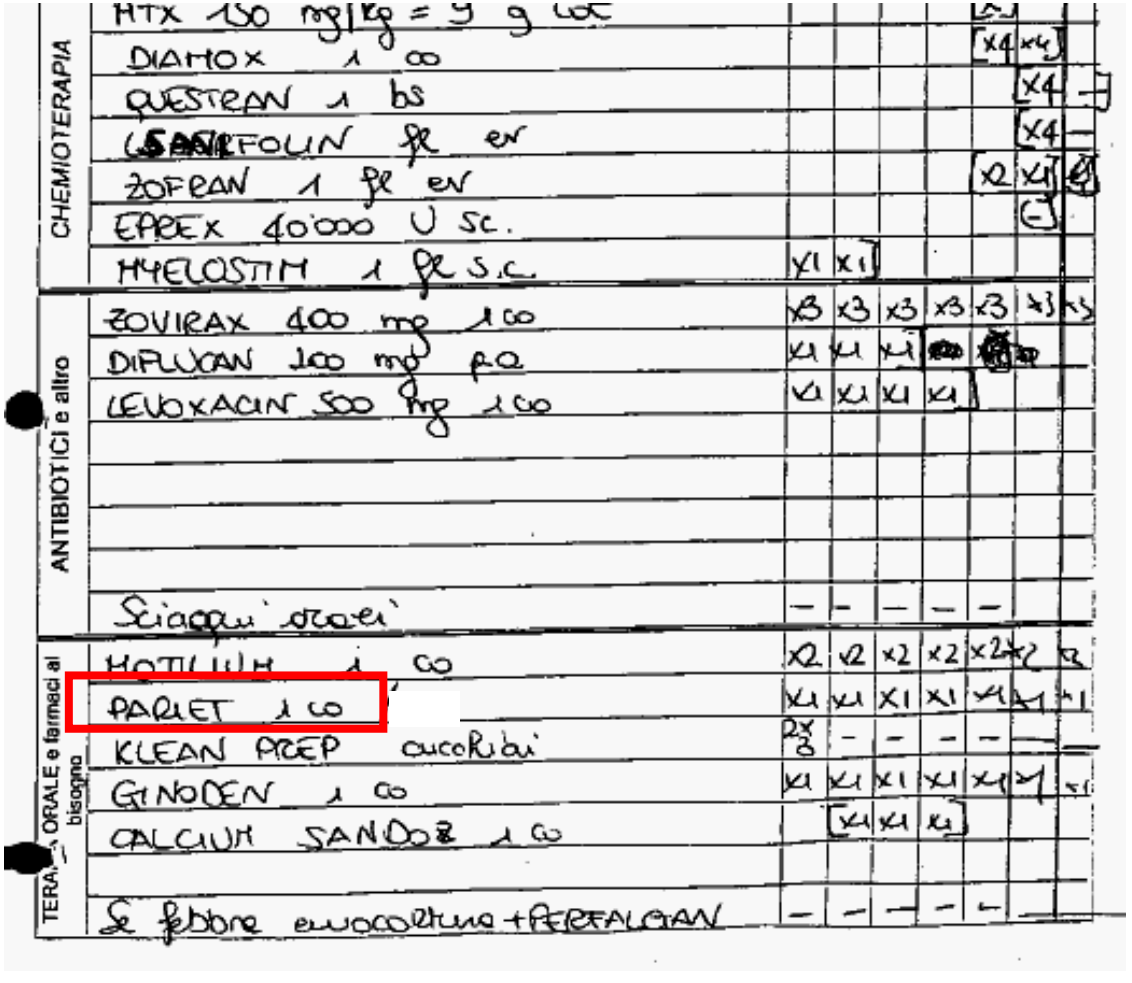
(Usare una scrittura comprensibile)

[redacted]

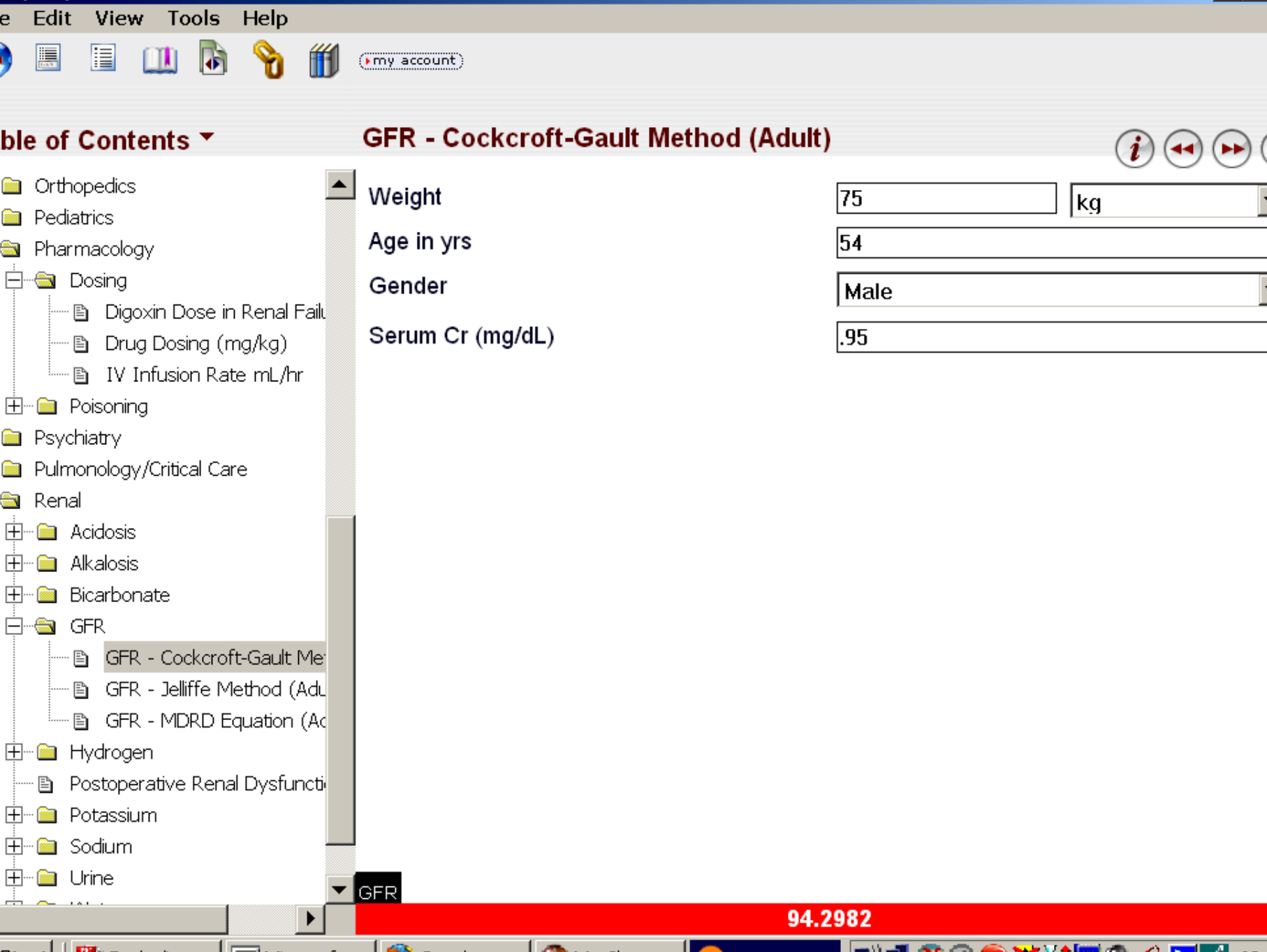
Letto n°____ __

	FARMACI e via di somministrazione	DATA anno 2008 mese Mar	giorni 12	13	14	15	16	17	18
IDRATAZIONE	Sacca Fisiologica 2000 ml/ora		80 100	120	120	120	120	120	120
	+ KCl mEq/sacca		100	100	60	40	30	30	30
	+ NaCl fl/sacca		8	8	8	8	8	8	8
	+ MgSO4 fl/sacca		2	2	2	2	2	2	2
	Ca Gluconato fl ev/dì		3x3	3x3	3x3	3x3	3x3	3x3	3x3
	Olicinomel N7 1300ml/die ml/ora		55	55	55	55	55		
	Insulina Ui/sacca		45	48	60	60	60		
	Cernevit fl/sacca		1	1	1	1	1		
CHEMIOTERAPIA	Solumedrol mg ev/dì		25	10	10	10	5		
	Entocir mg po		9	6	6	6	6	6	6
	Prograf mg/dì po		0,5 x2	0,5 x2	1x 2	1x 2	1x 2	1x 2	1x 2
	Ig Vena 20g ev/dì				X				
	Cobetin 1 fl + Sanifolin 1 fl		V	V	V	V	V	V	V
ANTIBIOTICI e altro	Zyvoxid 600mg ev/dì (in 100cc SF)		x2	x2	x2	x2	x2	x2	x2
	Merrem 1gr ev/dì (in 100 cc SF)		x3	x3	x3	x3	x3	x3	x3
	~~[illegible]~~ Tavanic 500 mg ev/dì		x1	x1	x1	x1	x1	x1	x1
	Diflucan 400mg ev/dì		x1	x1	x1	x1	x1	x1	x1
	Zovirax 500 mg ev/dì (in 100cc SF)		x3	x3	x3	x3	x3	x3	x3
	Actrapid in base a glicemia							V	V
	Fortimel 1 flac/dì		x2	x2	x2	x2	x2	x2	x2
TERAPIA ORALE e farmaci al bisogno	Mepral 1 fl ev/dì		x2	x2	x2	x2	x2	x2	x2
	Seropram [illegible] gtt la sera		x1	x1	x1	x1	x1	x1	x1
	Deniban cp/dì		1	1	1	1	1	1	1
	Seleparina 0,6 ui s.c.		x1	x1	x1	x1	x1	x1	x1
	Contramal 1 fl a.b. (MAX 3/die)		V	V	V	V	V	V	V
	Actrapid 8 U se glicemia > 250	PROFILO GLICEMICO	V	V	V	V	V	V	
	Actrapid 4U se glicemia 150-250		V	V	V	V	V	V	

FARMACO	INDICAZIONI TERAPEUTICHE	FABBISOGNO/DIE	DA DILUIRE IN … prima della somministrazione
Oliclinomel N71000E (1500 ml)	Nutrizione parenterale per adulti e bambini sopra i 2 anni quando l'alimentazione orale od enterale è impossibile, insufficiente o controindicata	Dose max/die 36 ml/Kg (2,520 ml x pz di 60-70 Kg). Non somministrare più di 1,5 ml/Kg/h dell'emulsione per infusione (non + di 105 ml/h per pz di 70 Kg). Durata infusione di circa 24 h.	Possibilità di aggiunta di vitamine, oligoelementi e altri elettroliti, se ritenuto necessario. Si possono aggiungere anche farmaci (es. insulina).
Composizione	Sacca a triplo compartimento. Compartimento con emu		



Zhu LL, Zhou Q, Yan XF, Zeng S.
Optimal time to take once-daily oral medications in clinical practice.
Int J Clin Pract. 2008 Oct;62(10):1560-71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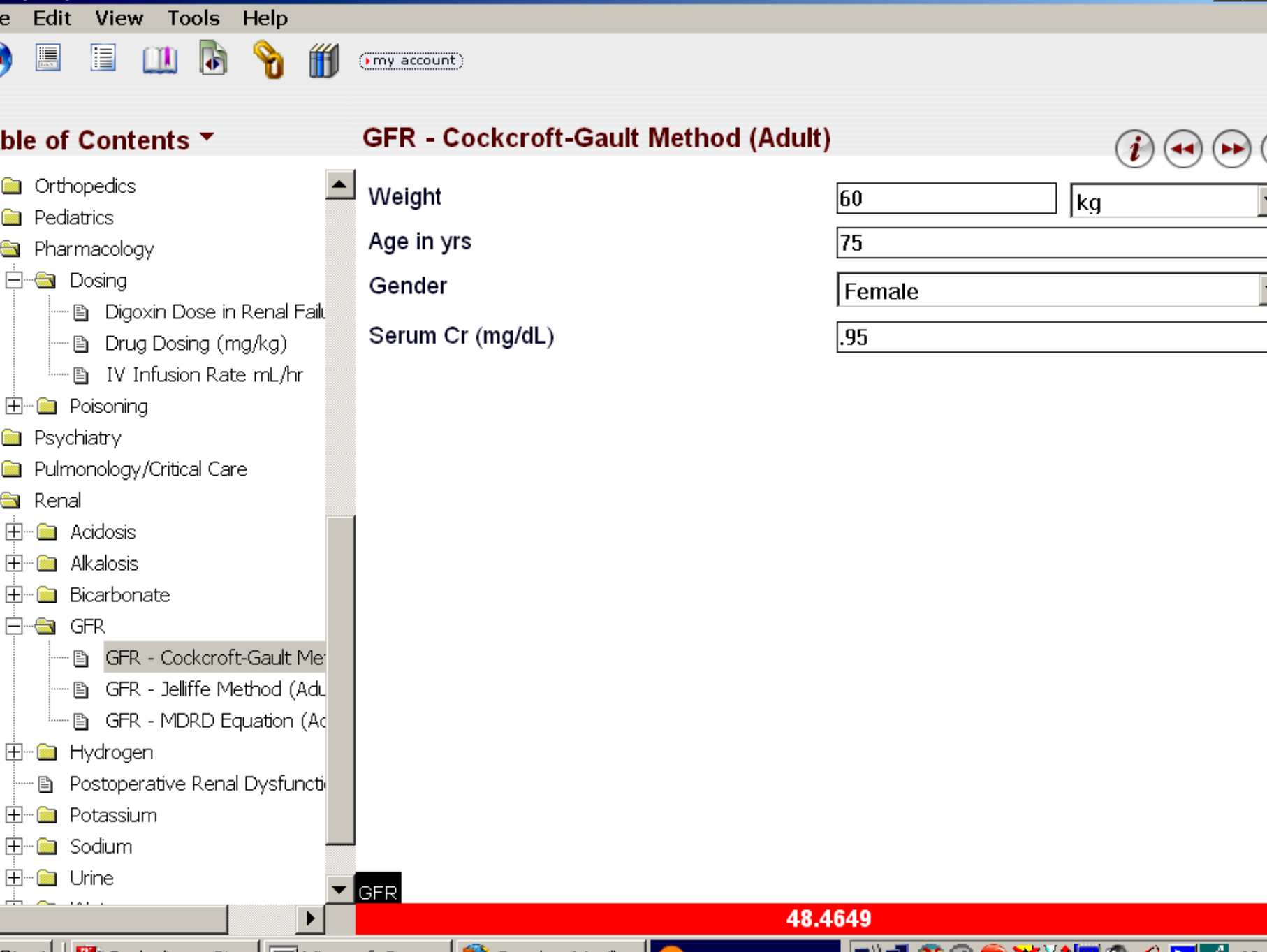
my account
ble of Contents
GFR - Cockcroft-Gault Method (Adult)
Orthopedics
Pediatrics
Pharmacology
Dosing
Digoxin Dose in Renal Failu
Drug Dosing (mg/kg)
IV Infusion Rate mL/hr
Poisoning
Psychiatry
Pulmonology/Critical Care
Renal
Acidosis
Alkalosis
Bicarbonate
GFR
GFR - Cockcroft-Gault Me
GFR - Jelliffe Method (Adu
GFR - MDRD Equation (Ac
Hydrogen
Postoperative Renal Dysfuncti
Potassium
Sodium
Urine
Weight
75
kg
Age in yrs
54
Gender
Male
Serum Cr (mg/dL)
.95
GFR
94.2982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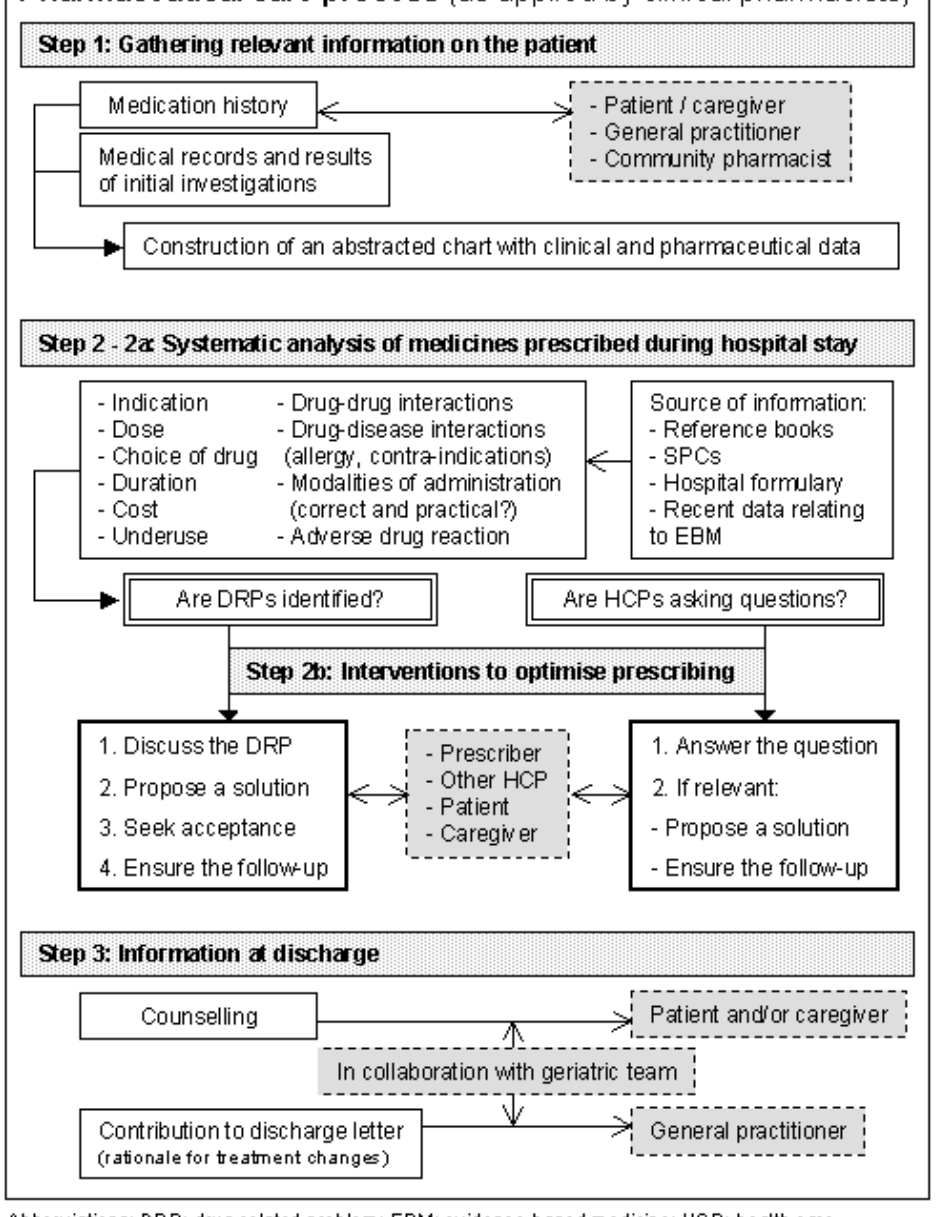
IV Infusion Rate mL/hr
Poisoning
Psychiatry
Pulmonology/Critical Care
Renal
Acidosis
Alkalosis
Bicarbonate
GFR
GFR - Cockcroft-Gault Me
GFR - Jelliffe Method (Adu
GFR - MDRD Equation (Ac
Hydrogen
Postoperative Renal Dysfuncti
Potassium
Sodium
Urine
Weight
60
kg
Age in yrs
75
Gender
Female
Serum Cr (mg/dL)
.95
GFR
48.4649

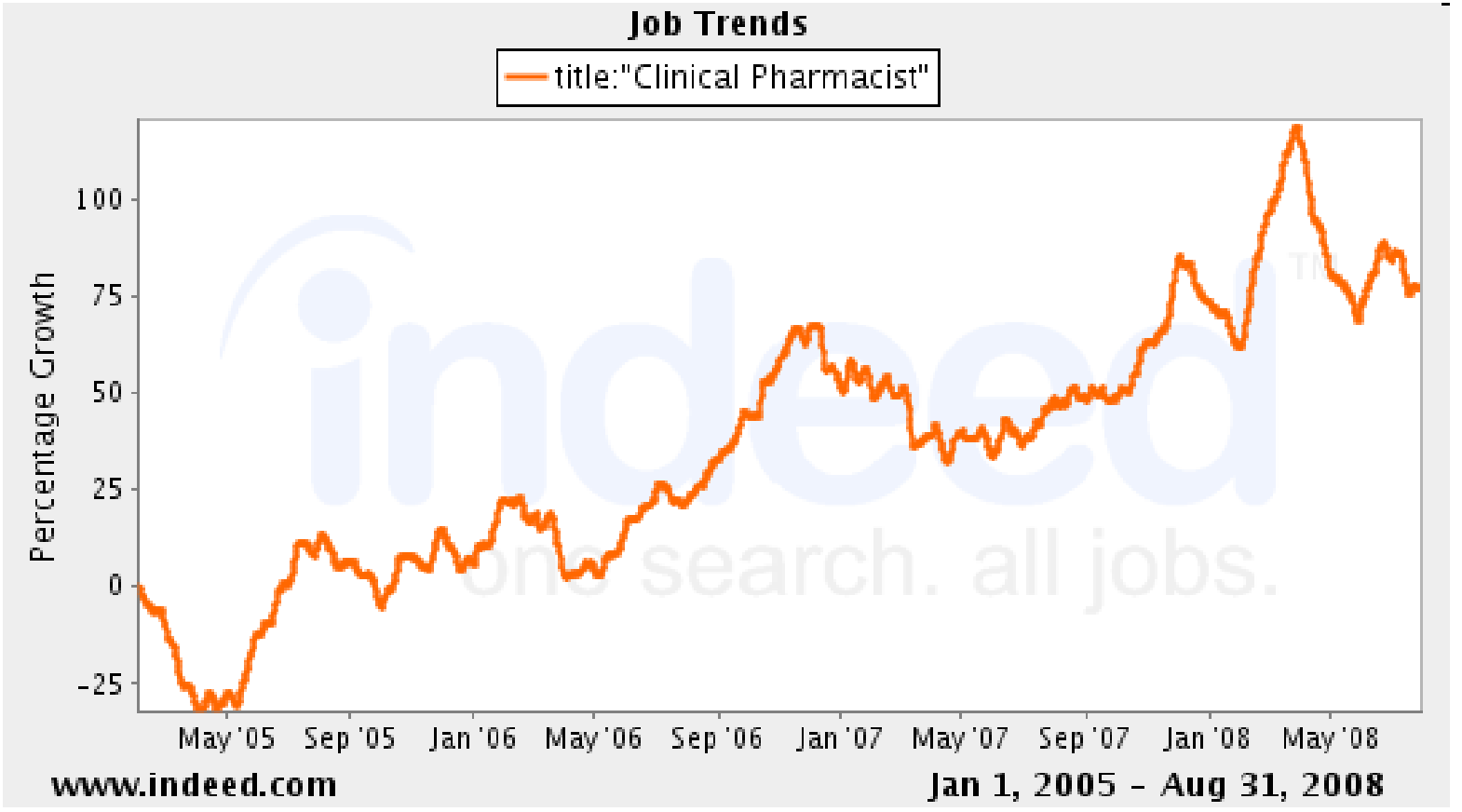
Nephrotoxicity, %	8 (I) vs 14.4 (C); $P = .08$
Febrile period, d	2.09 (I) vs 3.84 (C); $P < .05$
In-hospital mortality, %	18.7 (I) vs 10.0 (C); $P > .05$
Length of stay, d	13.4 (I) vs 18.4 (C); $P = .08$
Hospital cost per patient, $	7102 (I) vs 13 758 (C); $P < .05$

Destache CJ et al., *Ther Drug Monit*. 1990;12:419-426



Abbreviations: DRP: drug-related problem; EBM: evidence-based medicine; HCP: health care professional; SPC: summary of product characteristics.
Grey dotted boxes represent persons with whom the clinical pharmacist collaborated.

From Spinewine et al., unpublished


Job Trends
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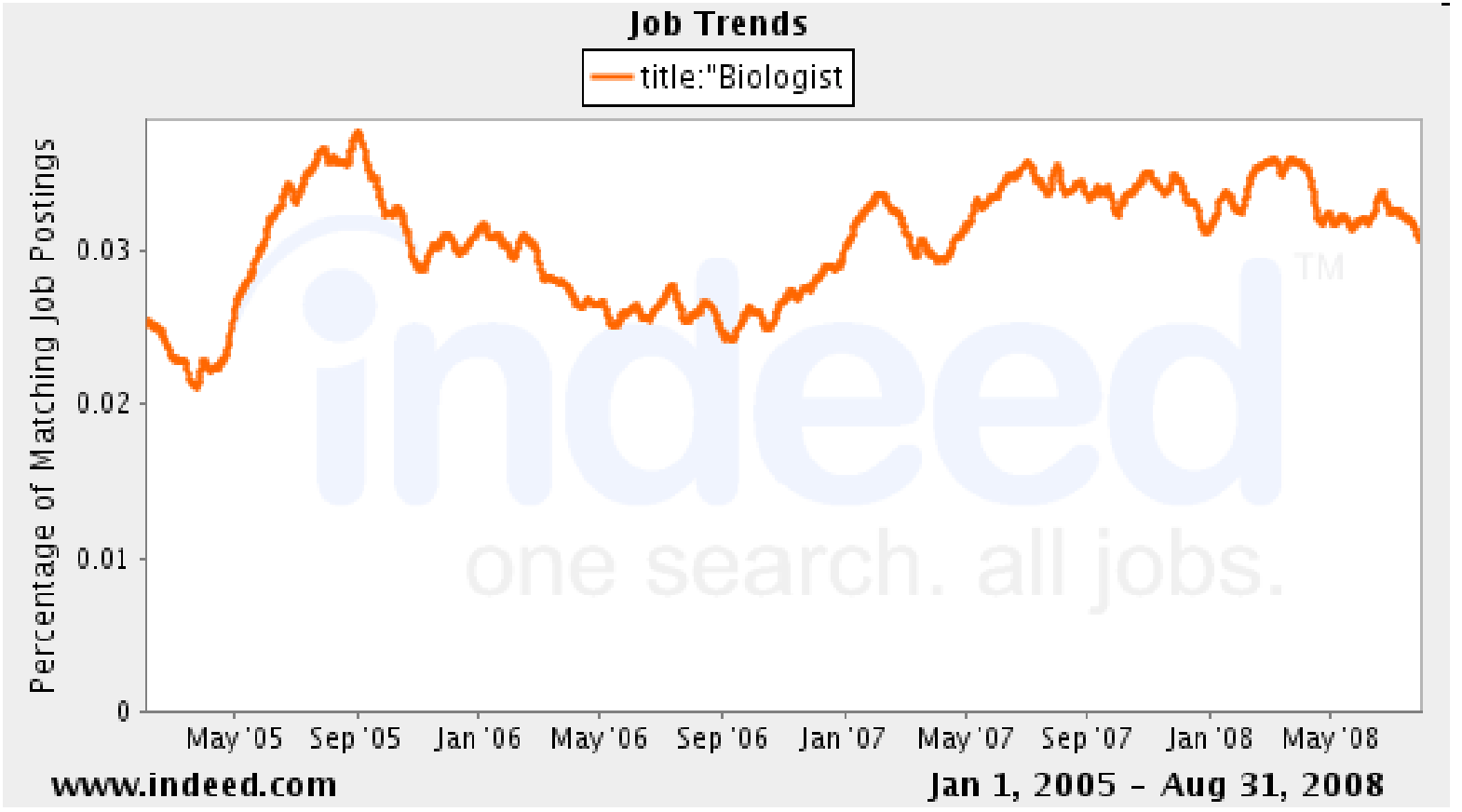
Percentage Growth
100
75
50
25
0
-25
May '05
Sep '05
Jan '06
May '06
Sep '06
Jan '07
May '07
Sep '07
Jan '08
May '08
www.indeed.com
Jan 1, 2005 - Aug 31, 2008


Job Trends
title:"Biologist
Percentage of Matching Job Postings
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0.01
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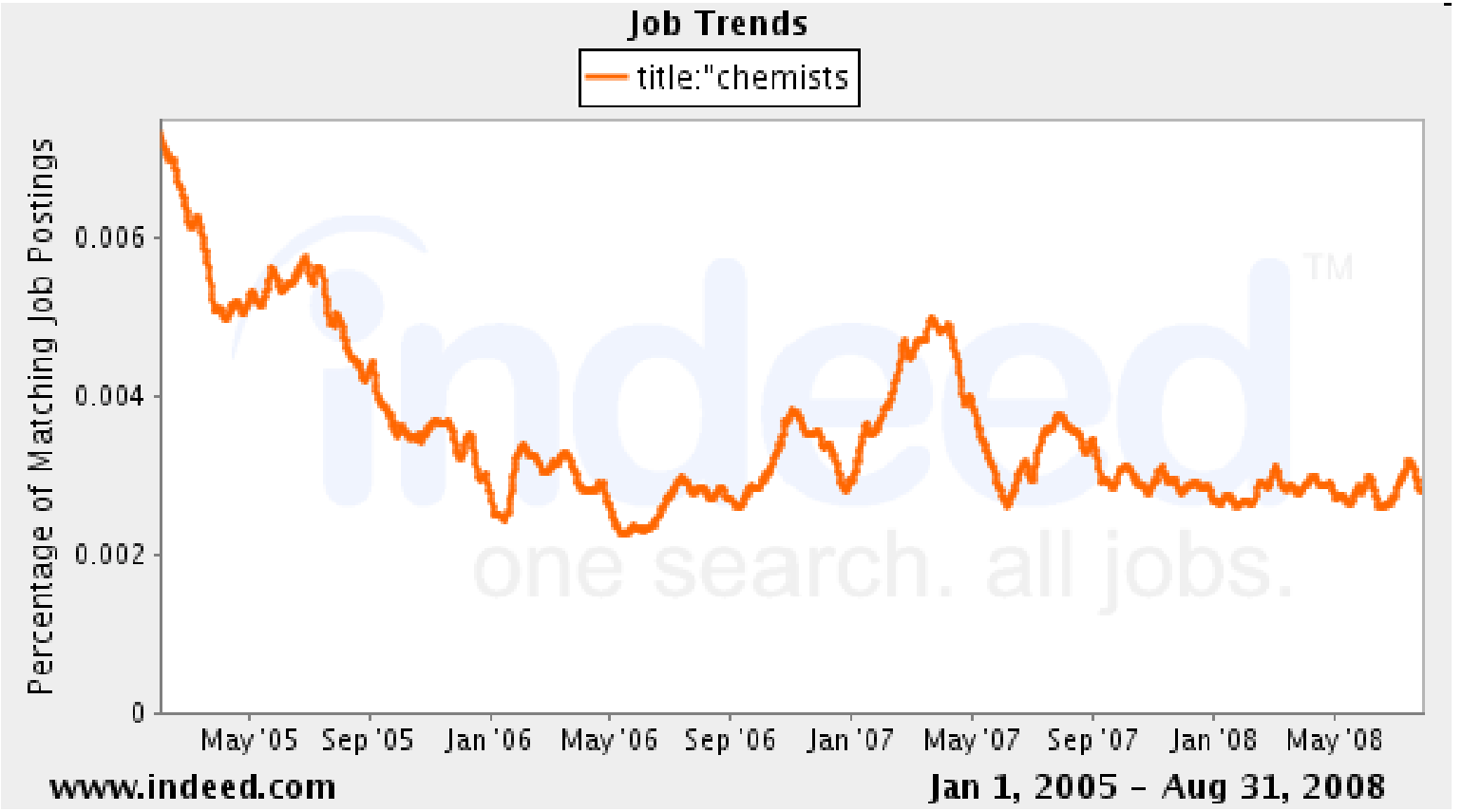
May '05
Sep '05
Jan '06
May '06
Sep '06
Jan '07
May '07
Sep '07
Jan '08
May '08
www.indeed.com
Jan 1, 2005 - Aug 31, 2008
indeed
one search. all jobs.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Percentage of Matching Job Postings
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Sep '05
Jan '06
May '06
Sep '06
Jan '07
May '07
Sep '07
Jan '08
May '08
www.indeed.com
Jan 1, 2005 - Aug 31, 2008
indeed
one search. all jobs.

ASHP national survey of pharmacy practice in hospital settings: Monitoring and patient education—2006

The number of pharmacists per 100 occupied beds has increased, and the number of pharmacist vacancies remained stable

Pedersen CA et al., Am J Health-Syst Pharm. 2007; 64:507-20

Table 3.

Electronic Access to Patient Information

Characteristic	Electronic Access to Laboratory Data by Pharmacists		Electronic Information Transfer of Patient Data Between Inpatient and Outpatient Settings for Use by Pharmacists[a]	
	n	%	*n*	%
No. staffed beds				
<50	51	70.6[b]	51	62.7
50–99	86	90.7	86	57.0
100–199	73	93.2	73	58.9
200–299	76	100.0	76	61.8
300–399	81	96.3	81	48.1
≥400	93	100.0	93	57.0
All hospitals—2006	460	87.3	460	59.2
All hospitals—2003[3]	552	78.0	547	45.1
All hospitals—2000[12]	523	73.8	520	37.9

[a]Patient data included medication histories, laboratory data, and allergy history, among other information.
[b]Uncorrected $\chi^2 = 57.9344$, $df = 5$, design-based $F(2.86, 1300.51) = 12.5458$, $p < 0.0001$.

Pedersen CA et al., Am J Health-Syst Pharm. 2007; 64:507-20

Table 5.
Pharmacist Involvement in Therapeutic Drug Monitoring for Inpatients

Characteristic	Routinely Monitor Medication Levels		Authority To Order an Initial Serum Medication Level[a]		Authority To Adjust a Dosage for a Routinely Monitored Medication[a]		Notified When Medication Levels Fall Outside of Therapeutic Range	
	n	%	*n*	%	*n*	%	*n*	%
No. staffed beds								
<50	51	86.3	44	56.8[b]	44	65.9	51	47.1
50–99	86	87.2	75	78.7	75	80.0	86	43.0
100–199	73	86.3	63	74.6	63	79.4	73	46.6
200–299	76	93.4	71	77.5	71	70.4	76	55.3
300–399	81	87.7	71	71.8	71	74.6	81	49.4
≥400	93	90.3	84	65.5	84	73.8	93	44.1
All hospitals—2006	460	87.8	408	69.1	408	73.2	460	47.3
All hospitals—2003[3]	551	75.5	435	63.3	434	64.6	550	35.5
All hospitals—2000[12]	520	75.6	389	58.6	390	63.1	520	36.5

[a]Of those hospitals that have pharmacists routinely monitor inpatients' medication levels.
[b]Uncorrected $\chi^2 = 15.2964$, $df = 5$, design-based $F(3.46, 1391.99) = 3.1254$, $p = 0.0193$.

Pedersen CA et al., Am J Health-Syst Pharm. 2007; 64:507-20

Autologous stem cell transplant in 716 patients with multiple myeloma: low treatment-related mortality, feasibility of outpatient transplant, and effect of a multidisciplinary quality initiative

Gertz MA et al., Mayo Clin Proc. 2008 Oct;83(10):1131-8