



The Renal Pharmacist

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Summer 2004

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ADDRESS/INFO CHANGES

Please forward any address/phone number changes to the Secretary/Treasurer. Her e-mail is shelley.parker@grhosp.on.ca. We are constantly updating our membership mailing list. Thank you.

View from the Chair (May 2004)

Greetings,

What a great feeling it is when spring finally starts to turn into summer! I always find the beginning of summer brings a little more perspective into my life. Work and non-work life somehow achieve a better balance. Everyone is a little more reluctant to work that extra hour at the end of the day when the alternative is enjoying a few more hours of warm daylight after work.

We've commented before in this column about how hard we all work. Renal pharmacists achieve a lot, both in direct patient care activity and in the "other" work that is a part of our jobs. We all need to continue to find the balance between high achievement at work and satisfaction with our home lives. Perhaps the beautiful weather and warm evenings can act as a good incentive for all of us.

The RPN as a group can look back at a successful spring educational evening. Dr. Alice Cheng, an endocrinologist from St. Michael's Hospital presented the new Canadian Diabetes Guidelines. Her presentation was excellent both with respect to the thorough content she presented and her interactive style of teaching.

The RPN executive has just finalized our pharmacy speakers for this year's CANNT conference 2004 (Canadian Association of Nephrology Nurses and Technologists). This national conference will be held in Niagara Falls, Ontario this year. This will be the third year that the RPN has been involved and we hope to build on our success last year in Vancouver. Consider spending some time with us at the conference this year, November 18-21, 2004. Pharmacy talks will occur on Nov. 19th and 20th. Look for program details soon on the CANNT website, www.CANNT.ca.

While we all look forward to CANNT and our local September 2004 continuing education evening (more details soon!), I also hope everyone can bring it down a notch and manage to enjoy a wonderful, relaxing summer season.

Enjoy,

Andrea Fox
Chair, Renal Pharmacist Network

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Alteplase Protocol 1 mg/ml

Submitted by Karen Shalansky, Pharm D, Vancouver General Hospital, Vancouver, BC

PROPOSAL: Switch to alteplase 1 mg/mL – 1 mL per lumen (i.e. 1 mg alteplase per lumen)

Literature Support

Am J Health-Syst Pharm 2002;59:1437-40.

- Open-label comparison of alteplase 1 mg/ml – 1 mL per lumen (n=27) vs urokinase 5000 u/mL – 1 mL/lumen (n=10)
- Method of instillation – 1 mL instilled into each catheter, then qs with NS; at 20 minute intervals 0.2 mL NS x 3 for total of 60 minutes was added to each port; then aspirated
- alteplase twice as likely to achieve HD flow rates >300 mL/minute compared to urokinase (70% vs 35%, p=0.0134)
- 93% patients on alteplase vs 70% patients on urokinase able to complete HD session (p=0.0234)
- no significant difference in functioning HD catheters at subsequent HD session (86% vs 65%, p=0.08)

Pharmacotherapy 2002;22:1344 (abstract)

- occluded Hickman catheters (n=41) or implanted ports (n=20)
- Randomized trial comparing 1 mg or 2 mg alteplase per port x 60 minutes
- Catheter clearance rates were 81.1% – 1 mg and 83.3% – 2 mg (NS)

Am J Health-Syst Pharm 2000;57:1039-45

- Sequentially added 0.5 mg, 1 mg and 2 mg alteplase per lumen in 58 CVC catheters (not HD patients) followed by NS to (catheter) volume. Dwell x 60 minutes then aspirated, catheter then flushed with NS. If flushing could not occur, then dose escalation occurred up to 2 mg strength.
- Pediatric and adult patients ~ 50/50
- 86.2% (50 catheters) were cleared with 0.5 mg, a further 8.6% (5 catheters) with 1 mg and a further 1.7% (1 catheter) with 2 mg strength

J Thromb Thrombolysis 2001;11:127-36

- systematic review of literature of thrombosed HD catheters
- suggested 1 mg tPA likely equivalent to 36,000 units urokinase
- suggested 1-2 mg/lumen tPA is a suitable dose for catheter instillation and likely to be more effective than 5000 units/lumen urokinase

Hospital Support Protocols

Credit Valley Hospital (Ontario) Policy Date: Sept 1999

(~64 beds; catheter volumes currently majority >2 mL)

TPA 1mg (1mL) per CVC lumen followed by NS to fill lumen volume. Dwell time 30 minutes or to next dialysis. TPA aspirated prior to flushing line to check for patency.

Ottawa General Hospital (Ontario) Policy Date: Dec 2001

TPA 1 mg into each lumen, then qs with NS to catheter volume.

- 1) Instil 0.25 mL NS into each lumen x 4 q15minutes for total of 60 minutes, then attempt to aspirate; or
- 2) Leave *in situ* until next HD, then aspirate prior to attempting HD.

Royal Jubilee Hospital (BC) Policy Date: Feb 1999

1) 1 mg instilled into each lumen, then qs with NS and dwell for 30 minutes, then aspirate

2) 1 mg instilled into each lumen, then qs with heparin 1:10,000 solution; dwell until next HD run then aspirate

Survey of 7 Ontario Hospitals 2001 (4/7 used 1 mg/lumen)

Grand River Hospital – 1 mg qs with NS to volume of lumen, 20 minute – 48 hour dwell

William Osler Health Centre – 1 mg qs with heparin 1:10,000 to volume of catheter, 20-45 minute dwell or until next dialysis

Humber River Regional Hospital – 1 mg qs with NS to volume of lumen, 60 minute dwell unless ordered otherwise

Credit Valley Hospital – 1 mg qs with NS to volume of lumen, as per previous description

*Karen Shalansky, Pharm.D., Vancouver General Hospital
Joanne Jung, B.Sc. (Pharm), St. Paul's Hospital
November 17, 2003*

Deadline for submissions for the next Newsletter is September 24, 2004. E-mail or call Reshma Rathod, Communications Co-ordinator, using the contact information on the front of this newsletter.

OCCLUDED HEMODIALYSIS CATHETER PROTOCOL

Vancouver General Hospital

Date: _____

Time: _____

A. Forceful Flush

1. Draw 10 mL NS in 2 x 10 mL syringes with Luer-lock
2. Forcefully flush with maximum force both catheter ports
3. If flush successful, attempt aspiration of blood and perform 2-3 additional forceful flushes with aspirated blood
4. If initial flush unsuccessful, repeat steps 1-3; if still unsuccessful, attempt alteplase (tPA) instillation

B. Alteplase (tPA) Instillation

1. Instill alteplase 1 mg (1 mL) into each lumen, then instill sufficient amount of NS to fill internal volume of each catheter PLUS 0.2 mL. Example: for a catheter volume of 2.2 mL use 1 mg/mL alteplase followed by 1.4 mL NS. **Do not premix the alteplase and NS.**
 - Wait 60 minutes, then attempt to aspirate. Forcefully flush catheters with 10 mL NS prior to start of dialysis.
 - Leave alteplase *in situ* until the next hemodialysis. Aspirate alteplase prior to next run. Forcefully flush catheters with 10 mL NS prior to start of dialysis.
2. Protocol may be repeated on two consecutive occasions within a two week period; otherwise physician to be contacted for line reassessment (linogram).

Physician signature
OHCP

Physician printed name / PIC
Rev. Nov/03

Hepatitis B Immunization Survey

Centre	Name of Vaccine	Route(s)	When is the ID protocol started?	Titre levels to stop Immunization (IU/L) (Checked after series complete)
British Columbia	Recombivax	IM only	N/A	10
Cobourg (Ontario)	Engerix B	IM only	N/A	10
Grand River (Ontario)	Recombivax	IM only	N/A	>10
Humber River Regional Hospital (Ontario)	Recombivax	IM only	N/A	>10
Lakeridge Health (Ontario)	Engerix B	IM only	N/A	10
London Health Sciences Centre (Ontario)	Recombivax	IM only	N/A	10
North Bay General Hospital (Ontario)	Engerix B	IM only	N/A	>10
Sunnybrook & Women's College Health Sciences Centre (Ontario)	Recombivax	IM only	N/A	Reported as positive or negative
St. Michael's Hospital (Ontario)	Engerix B	ID only	N/A	>1000
Toronto East General Hospital (Ontario)	Recombivax	IM only	N/A	>10
University Health Network (Ontario)	Engerix B	IM/ID	After the four dose vaccination series, plus 1 booster if titres are negative or <10 IU/L	10 (IM protocol), for ID plan to achieve >100
York Region Dialysis Program (Ontario)	Engerix B	IM/ID	After the four dose vaccination series	100

The next issue is to find out how many patients are not seroconverting. Is Recombivax as effective as Engerix B? What percentage of patients undergoing ID proto

e) Stopping point if patient does not seroconvert	Cost of Drug is covered by Provincial or Dialysis Budget	Frequency of titres being checked.	If titres absent, what do you do?
After 2 full sets of vaccination (i.e. 6 doses)	Provincial Budget	Yearly	Booster Given
After 1 full set plus 2 booster doses	Dialysis Program	Q6 months	Booster Given
After 2 full sets of vaccination (i.e. 6 doses)	Province covers 2 doses, Dialysis program pays for remainder	Yearly	Booster Given
After 2 full sets of vaccination (i.e. 6 doses)	Province covers 2 doses, Dialysis program pays for remainder	Yearly	Booster Given
After 2 full sets of vaccination (i.e. 8 doses)	Dialysis Program	Yearly	Booster Given
After 2 full sets of vaccination (i.e. 6 doses)	Province pays for 2 doses, Dialysis Program pays for remainder	Q6 months	Booster Given
After 1 full set plus 3 more booster doses q monthly	?	Yearly	Booster Given
After 2 full sets of vaccination (i.e. 6 doses)	Province pays for 2 doses, Dialysis Program pays for remainder	Q6 months	? Booster Given
ID protocol (5 ug q2weeks) is continued until titres >1000 or 18 months has passed (titres checked q 6 months)	Dialysis Program	Dependent on previous titre i.e. >500 check in 12 months, >100-499 check in 6 months etc.	Booster Given if < 20
After 1 full set plus 2 more boosters	Provincial Program and Patient (booster doses)	Yearly	Booster Given
ID protocol (5 ug q2weeks) is stopped after 9 months if no seroconversion (checked q3months)	Dialysis Program	Q6 months	Booster Given
ID protocol (5 ug q2weeks) is stopped after 12 months if no seroconversion (checked q4months)	Dialysis Program	Yearly	Booster Given (up to 2)

col seroconvert? More to come ...

Rituximab Administration Guideline for Renal Salvage

Submitted by Paul M Dombrower, Pharmacy Clinical Specialist, Nephrology, UNC Hospitals, Chapel Hill, NC

Purpose

Guidelines for the nursing care and management of patients receiving intravenous rituximab (Rituxan) for the treatment of glomerular injury.

Level

Interdependent (requires physician order)

Supportive data

Rituximab is a human-murine monoclonal antibody; It binds to the CD-20 antigen on the surface of pre-B cells and mature B-lymphocytes. Intravenous rituximab may be helpful in the treatment of certain types of aggressive glomerular injury. Specifically, patients with membranous nephropathy, nephrotic syndrome, lupus nephritis, or humoral rejection of transplanted kidney may benefit from weekly intravenous rituximab.

Contraindications to rituximab are hypersensitivity to murine (mouse) proteins. Caution should be used in patients with active infections, thrombocytopenia, leukopenia, or pre-existing cardiac conditions (angina, arrhythmias).

Side effects that have been reported in clinical trials of rituximab for the treatment of glomerular injury include:

- Wheezing
- Acute respiratory infection
- Gastroenteritis
- Muco-cutaneous reactions
- Fatigue
- Arthralgias
- Thrombocytopenia

Assessment

1. Assess prior to infusion:
 - A clinical history of allergic reactions to mouse serum/products or previous reactions to rituximab.
 - A recent CBC and platelet count. Dose should be reduced or held if temperature >38.5 or evidence of active infection.
 - IV access: Administer rituximab via

peripheral line with minimum 20 gauge or via central line.

- Patient to be weighed on admission or day of administration (to calculate BSA).
- If patient has a history of angina or arrhythmias, the patient shall be placed on telemetry.
- Orders for rituximab and pre-meds must be written on a chemotherapy form and signed by a nephrology attending or fellow. Orders must be received by pharmacy by 4 p.m. or will not be prepared until the following morning.

2. Assess blood pressure, pulse, respirations, temperature prior to initiating infusion and then as follows for first infusion.

- Every 15 min x 4
- Every 30 min x 2
- Every 2 hr until infusion complete

For subsequent infusions if no significant reactions were reported with initial infusion, the following schedule may be used for monitoring vital signs:

- Every 30 min x 4
- Every 2 hr until infusion complete

Administration

3. Dosing rituximab for the treatment of glomerular or kidney injury may be 375 mg/m² or 1000 mg every seven days for a duration of four weeks.

4. Administer pre-medications per physician order 30-60 minutes prior to rituximab administration:

- A. Acetaminophen 650 mg po/pr
- B. Diphenhydramine 50 mg iv/po
- C. Prednisone 100 mg po or hydrocortisone 100 mg iv

5. Verify drug dose, rate calculation, correct product and expiration date with second licensed personnel.

6. Administer dose with infusion pump.

7. Hold all anti-hypertensive medications prior to and during infusion.

8. Infuse initial dose at rate of 50 mg/hr; if no reaction is evident, the infusion may be

increased by 50 mg/hr q 30 min to maximum of 400 mg/hr. It is suggested that a maximum rate of 200 mg/hr be used on non-oncology or non-critical care units.

9. Subsequent doses may be initiated at 100 mg/hr if initial infusion was well tolerated.

10. Monitor IV access closely for signs/symptoms of infiltration.

Observe for Side Effects

Observe and report to physician mild to moderate adverse reactions. Reported side effects include nausea, pruritis, joint pain, muscle weakness or pain, and tachycardia.

In the event of serious hypersensitivity reactions or other severe side effects, infusion shall be temporarily halted and physician notified. Serious reactions that have been reported include wheezing, bronchospasm, hypotension, fever, chills, shortness of breath, irregular heart beat, and skin rash.

Patient/Caregiver Teaching

Instruct patient/caregivers of potential side effects and importance of reporting side effects to nurse.

Documentation

Document on MAR.

Document on progress notes, patient care record, or flowsheet:

- Assessment findings
- Reported conditions
- Interventions and patient response/outcomes
- Patient/caregiver teaching and level of understanding

References

- Fra Gp et al. Remission of refractory lupus nephritis with a protocol including rituximab. *Lupus* 2003 12(10):783-7.
- Kshirsagar AV, Nachman PH, Falk RJ. Alternative therapies and future intervention for treatment of membranous nephropathy. *Semin Nephrol.* 2003 Jul; 23(4):362-72.
- Ruggenti P et al. Rituximab in idiopathic membranous nephropathy: a one-year prospective study. *J Am Soc Nephrol.* 2003 Jul; 14(7):1851-7.

ARTICLES OF INTEREST

Please refer to the website www.renalpharmacists.net for a more complete list and links to the abstracts.

The prevalence of reduced glomerular filtration rate in older hypertensive patients and its association with cardiovascular disease: A report from the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial. Block GA, Martin KJ, de Francisco AL, Turner SA, Avram MM, Suranyi MG, Hercz G, Cunningham J, Abu-Alfa AK, Messa P, Coyne DW, Locatelli F, Cohen RM, Evenepoel P, Moe SM, Fournier A, Braun J, McCary LC, Zani VJ, Olson KA, Drueke TB, Goodman WG. *Arch Intern Med* 2004;164:969-976.

Cinacalct for secondary hyperparathyroidism in patients receiving hemodialysis. Sanchez C, Lopez-Barea F, Sanchez-Cabezudo J, Bajo A, Mate A, Martinez E, Selgas R. *N Engl J Med* 2004 Apr 8;350(15):1516-25.

Low vs standard calcium dialysate in peritoneal dialysis: differences in treatment, biochemistry and bone histomorphometry. A randomized multicentre study. Sanchez C *et al* *Nephrol Dial Transplant*. 2004 19:1587-1593.

Efficacy and side effects of intradermal hepatitis B vaccination in CAPD patients: A comparison with the intramuscular vaccination. Ka Foon Chau, Yuk Lun Cheng, Dominic N.C. Tsang, Koon Shing Choi, Kim Ming Wong, Wai Leung Chak, MRCP, Yiu Han Chan, MRCP, Chun Sang Li. *May* 2004;43(5):910-918.

K/DOQI clinical practice guidelines on hypertension and antihypertensive agents in chronic kidney disease. *AJKD* May 2004;43(5):Supplement.

Effect of statins versus untreated dyslipidemia on serum uric acid levels in patients with coronary heart disease: A subgroup analysis of the Greek atorvastatin and coronary-heart-disease evaluation (GREACE) study. Vasilios G. Athyros, MD, Moses Elisaf, MD, Athanasios A. Papageorgiou, MD, Athanasios N. Symeonidis, MD, Anthimos N. Pehlivanidis, MD, Vasilios I. Bouloukos, MD, Haralambos J. Milionis, MD, Dimitri P. Mikhailidis, MD. *April* 2004;43(4):589-600.

Treatment of hyperphosphatemia in hemodialysis patients: The Calcium Acetate Renigel Evaluation (CARE Study). Qunibi W.Y.; Hootkins R.E.; McDowell L.L.; Meyer M.S.; Simon M.; Garza R.O.; Pelham R.W.; Cleveland M.V.B.; Muenz L.R.; He D.Y.; Nolan C.R. *Kidney International*, May 2004;65(5):1914-1926(13).

Systematic review of the impact of N-acetylcysteine on contrast nephropathy. Pannu N.; Manns B.; Lee H.; Tonelli M. *Kidney International*, April 2004;65(4):1366-1374(9).

Effects of vitamin E on cardiovascular outcomes in people with mild-to-moderate renal insufficiency: Results of the HOPE Study. Mann J.F.E.; Lonn E.M.; Yi Q.; Gerstein H.C.; Hoogwerf B.J.; Pogue J.; Bosch J.; Dagenais G.R.; Yusuf S. *Kidney International*, April 2004;65(4):1375-1380(6).

Effect of N-acetylcysteine for prevention of contrast nephropathy in patients with moderate to severe renal insufficiency: A randomized trial. Jeffrey WH Fung *et al* *Am J Kidney Dis* 2004;43:801-808.

Non-transferrin-bound iron in the serum of hemodialysis patients who receive ferric saccharate: no correlation to peroxide generation. Barbara Scheiber-Mojdehkar, Barbara Lutzky, Roland Schaufler, Brigitte Sturm, and Hans Goldenberg. *J Am Soc Nephrol* 15:1648-1655.

Chronic kidney disease as a risk factor for cardiovascular disease and all-cause mortality: A pooled analysis of community-based studies. Daniel E. Weiner, Hocine Tighiouart, Manish G. Amin, Paul C. Stark, Bonnie MacLeod, John L. Griffith, Deeb N. Salem, Andrew S. Levey, and Mark J. Sarnak. *J Am Soc Nephrol* 15:1307-1315.

N-acetylcysteine for the prevention of radiocontrast induced nephropathy: A meta-analysis of prospective controlled trials. Abhijit V. Kshirsagar, Charles Poole, Amy Mottl, David Shoham, Nora Franceschini, Gail Tudor, Malay Agrawal, Cindy Denu-Ciocca, E. Magnus Ohman, and William F. Finn. *J Am Soc Nephrol* 15:761-769.

Calcium, phosphate, and parathyroid hormone levels in combination and as a function of dialysis duration predict mortality: Evidence for the complexity of the association between mineral metabolism and outcomes. Lesley A. Stevens, Ognjenka Djurdjev, Savannah Cardew, E. C. Cameron, and Adeera Levin. *J Am Soc Nephrol* 15:770-779.

Reducing high phosphate levels in patients with chronic renal failure undergoing dialysis: A 4-week, dose finding, open-label study with lanthanum carbonate. Hutchison AJ, Speake M, Al-Baaj F. *Nephrol Dial Transplant* 2004 Jul; 19(7):1902-6.

WEBSITES OF INTEREST

www.rphworld.com

This website is compiled by GTA (Greater Toronto area) pharmacists and has proven to be a very useful and comprehensive tool to clinical pharmacists. It contains links to reliable sites on the internet such as those for renal dosing guidelines from Bennet and WHO as well as the British Formulary. The website has links to a drug interaction checking site that offers the same quality as Facts and Comparisons. This site also has links to probably the largest collections of free CE for pharmacists. Check it out!



Lisa feels like a veteran in the Nephrology Pharmacy field after having worked for the York Region Dialysis Program since its inception in November 1996. She graduated from the University of Toronto in 1992

and completed her Residency at St. Joseph's Hospital in Hamilton in 1993. After working in Orthopedics and Outpatient Rheumatology at St. Joseph's for 1½ years, she moved to York Central Hospital in 1995. She tested out the medicine program, then computer implementation before jumping at the chance to implement the Pharmacist's role in the new Dialysis Program.

Currently Lisa works part-time, focusing most of her energies on Outpatient Hemodialysis, though she is experienced in all modalities of

renal failure. Her biggest challenge is keeping current with all of the guidelines and ensuring that her patients are meeting their medication goals. The most satisfying part of her job is getting to know and develop long-term relationships with her patients.

Lisa has been an active speaker on renal related issues, having spoken at the PPC's, MOMENTUM™, RPN Education session and for local Pharmacists Groups. You will find her name on the RPN website frequently. In fact you have probably received e-mails from her in the past in her role

as Communications Co-ordinator on the RPN executive. She has held this position since early 2000. She contributes regularly to the Newsletter and encourages everyone to share information.

During her home time, Lisa's most important job is taking care of her three sons. In her spare time she runs a home-based scrapbooking business (she's a scrapaholic), enjoys reading and has recently started jogging.

We thank you Lisa for all your time and effort devoted to the RPN over the years and many more to come!

UPCOMING CONFERENCES

CSHP Canadian Society of Hospital Pharmacists Annual General Meeting

August 14-17, 2004

The Westin Edmonton Hotel, Edmonton
www.cshp.ca

RPN Educational Evening

Hypertension and the New K/DOQI Guidelines

Speaker: Dr. Sheldon Tobe

Wednesday, September 22, 2004, 6 p.m.
Holiday Inn Yorkdale, Toronto, ON

EDTNA European Dialysis and Transplant Nurses Association

September 4-7, 2004

Geneva, Switzerland
www.edtna-erca.org

Prevention in Renal Disease 2004

October 1-2, 2004

Toronto, Ontario

CDA Canadian Diabetes Association

October 27-30, 2004

Quebec City, Quebec
www.diabetes.ca

ASN American Society of Nephrology

October 27 – November 1, 2004

St. Louis, Missouri

www.asn-online.org

CANNT Canadian Association of Nephrology Nurses and Technicians

November 18-21, 2004

Niagara Falls, Ontario

www.cannt.ca

A Great Big **THANK YOU!**

To all of those who contributed (especially the new contributors!!) and to ORTHO BIOTECH for printing and distributing the newsletter.

BABY BOOM



Congratulations are extended to Gigi Wo on the birth of her second son, Zachary Mar. He was born on April 9, 2004 and

weighed 5 lbs and 11 ounces. Gigi who works at Lakeridge Health Corporation in Whitby is enjoying her new little one and big brother Joshua is also very excited to have a new brother.

CONDOLENCES

The RPN would like to extend their condolences to the family of Enid Hartman. Enid was a pharmacist at St Joseph's Health Centre for over 30 years and enjoyed attending all of the early RPN meetings. Enid retired from her position at St. Joseph's a year ago. She passed away peacefully with her family at her side on Monday February 9, 2004 at St. Joseph's Health Centre in her 62nd year.

Check out the RPN Website at www.renalpharmacists.net on a regular basis for 2004 CE activities.