

Requiem per la venolisi

Alessandro Crocoli
U.O. Chirurgia Generale e Toracica
Ospedale Pediatrico Bambino Gesù
Roma

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Proprio a me...



In un passato non troppo lontano

PRE ULTRASOUND

ACCESSO CHIRURGICO

COMPLICANZE

L'ago cerca la struttura, la via chirurgica la vede



ACCESSO CHIRURGICO

- ❑ E' PIU' SICURO
- ❑ E' ANATOMICO
- ❑ E' SOGGETTO A MINORI COMPLICAZIONI



In un passato non troppo lontano

- **Tecnica Chirurgica**



Perché la venolisi? -1-

“E’ la tecnica storicamente più conosciuta...”

Surg Gynecol Obstet. 1973 Apr;136(4):602-6.

A silicone rubber atrial catheter for prolonged parenteral alimentation.

Broviac JW, Cole JJ, Scribner BH.

PMID: 4632149 [PubMed - indexed for MEDLINE]

J Pediatr Surg. 1987 Aug;22(8):702-4.

Central venous catheters for children with malignant disease: surgical issues.

Cameron GS¹.

Perché la venolisi! -1-

“E’ la tecnica storicamente più conosciuta...”

$$r = f(n^m)$$

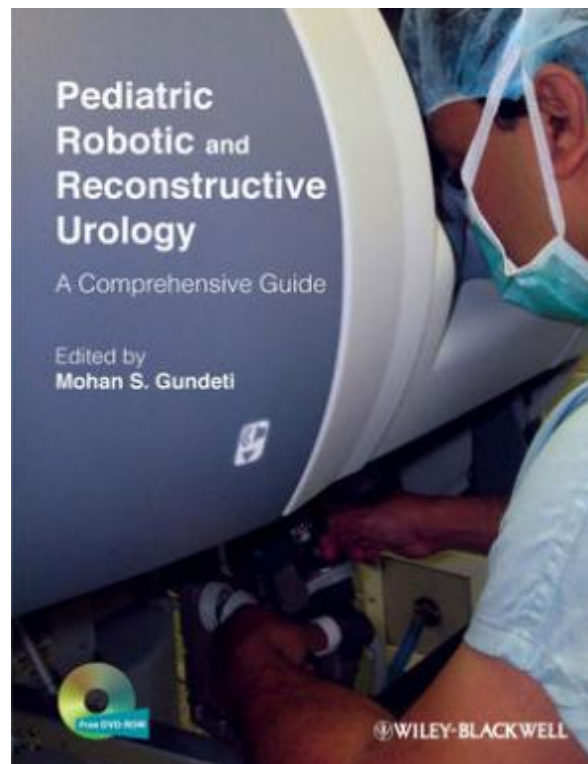
r = internal resistance to new ideas

n = number of employees

m = number of management levels

Perché la venolisi! -1-

“E’ la tecnica storicamente più conosciuta...”



To transition successfully from laparoscopy to robotic surgery requires many steps.

With these simple steps, this transition can be performed **relatively painlessly**

Perché la venolisi? -2-

- NON RICHIEDE LE **CONOSCENZE FISICHE E TECNICHE** DELL'ECOGRAFIA
- NON RICHIEDE **GRANDI CONOSCENZE DEI MATERIALI**
- NON RICHIEDE **APPARECCHIATURE "PARTICOLARI"** SPESSO DA CONDIVIDERE CON ALTRI...
- VIENE RITENUTA **PIU' RAPIDA**
- NON VENGONO SOMMINISTRATE **DOSI ELEVATE DI RADIAZIONI**

in other words

E' la tecnica più SEMPLICE

Perché la venolisi! -2-

- Tecnica che il chirurgo pediatrico deve conoscere
- Richiede skills di chirurgia vascolare/microchirurgia
- Danno vascolare permanente
→ trombosi
- INTERVENTO CHIRURGICO



If you go to the barber, you get your hair cut"

Perché la venolisi! -2-

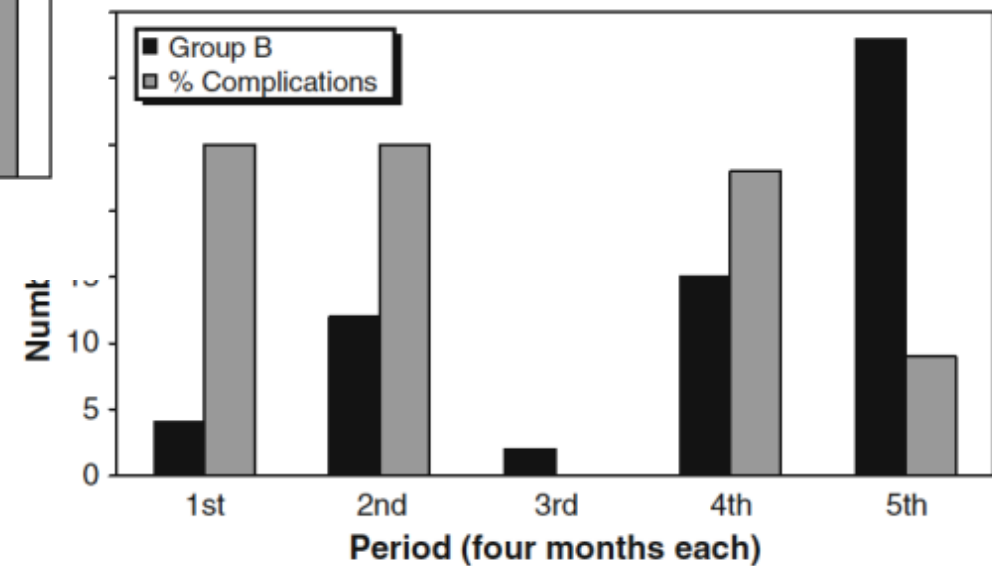
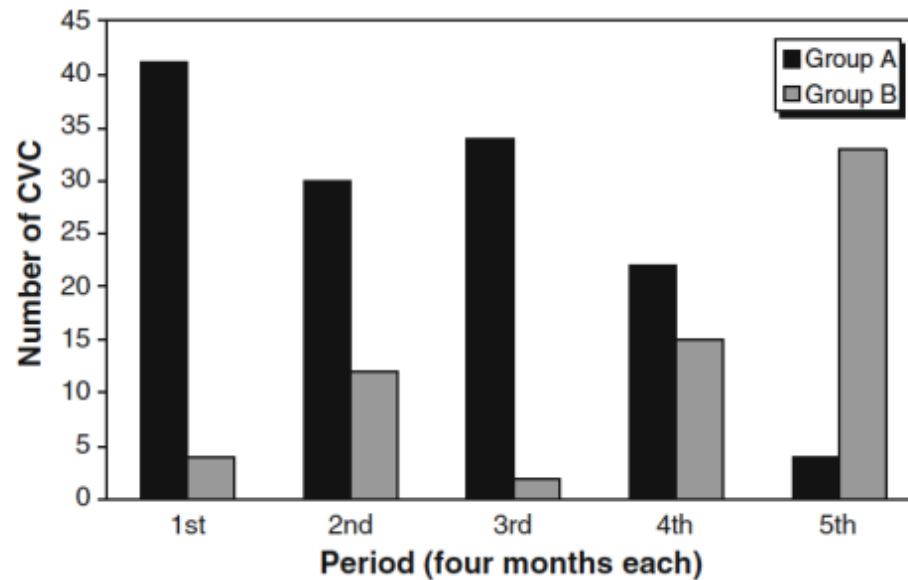
Pediatr Surg Int (2010) 26:819–824
DOI 10.1007/s00383-010-2636-z

ORIGINAL ARTICLE

Shifting from open surgical cut down to ultrasound-guided percutaneous central venous catheterization in children: learning curve and related complications

S. Avanzini • E. Guida • M. Conte • F. Faranda • P. Buffa • C. Granata •
E. Castagnola • G. Fratino • L. Mameli • A. Michelazzi • A. Pini-Prato •
G. Mattioli • A. C. Molinari • E. Lanino • V. Jasonni

Perché la venolisi! -2-



Perché la venolisi! -2-



Perché la venolisi! -2-

Review Article

Review of the radiation exposure during screening of surgically implanted central venous access devices

Jikol Friend *, Suzanna Lindsey-Temple, Ian Gollow, Elizabeth Whan, Parshotam Gera

Departments of Pediatric General Surgery, Princess Margaret Hospital, Subiaco, Western Australia, Australia

While radiation exposure and cumulative exposure are certainly a consideration in pediatric patients receiving surgically implanted central venous access devices, when converted to the effective dose, **the screening of surgically implanted venous access devices exposes most pediatric patients is approximately equivalent to a diagnostic chest x-ray or a trans-Atlantic flight**

Perché la venolisi! -2-

Review Article

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Departments of Pediatric General Surgery, Princess Margaret Hospital, Subiaco, Western Australia, Australia

Furthermore although percutaneous insertion exposes patients to slightly higher doses of radiation, **the exposure is minimal in clinical context and should not determine method of insertion.**

Perché la venolisi? -3-

Potentially Lethal Complications of Central Venous Catheter Placement

By Charles E. Bagwell, Arnold M. Salzberg, Roberta E. Sonnino, and Jeffrey H. Haynes
Richmond, Virginia

- 1.appreciation of the **inherent risks of central venous catheterization**;
- 2.close attention to **proper technical aspects of the procedure**;
- 3.rapid evaluation of **any unexplained problems** in the operating theater or during the early postoperative period are important components of management

E' la tecnica più SICURA...

Perché la venolisi? -3-



E' la tecnica più SICURA...

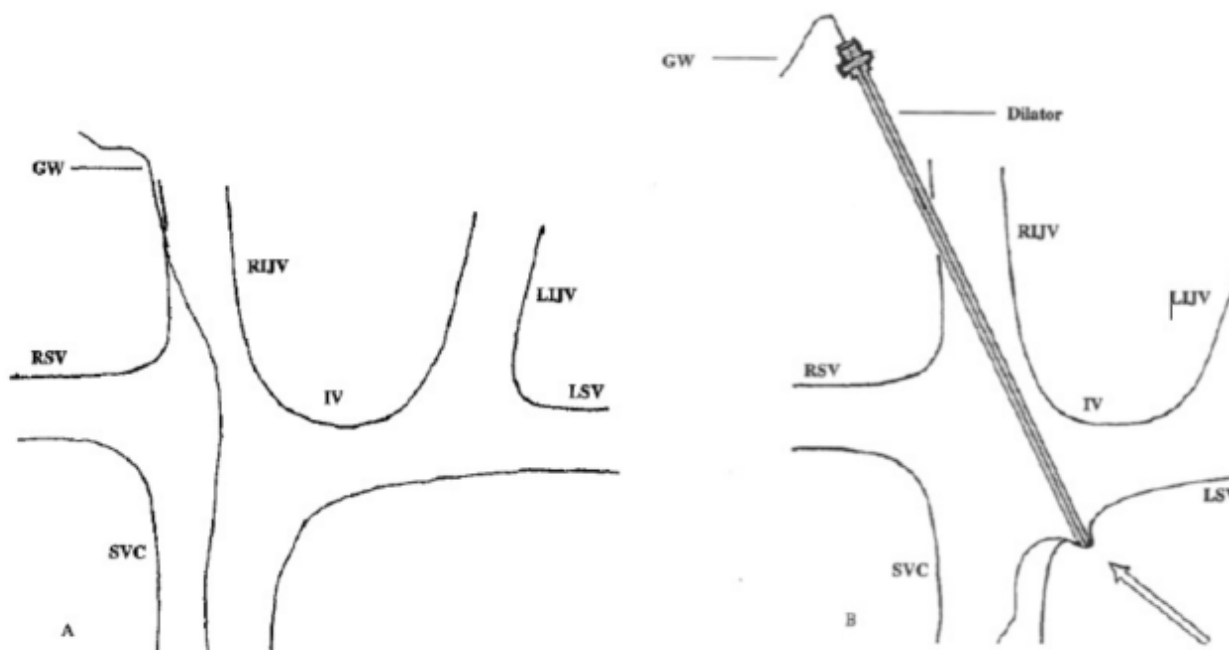
Perché la venolisi? -3-

“In spite of the wide use of US-guided CV catheterization, some clinicians still prefer using the OSC technique, especially in children. **This procedure can absolutely minimize the risk of mechanical complications**”

“...because the cervical space in children is not wide enough for the placement of the US probe, the long axis approach is not acceptable for small children...”

E' la tecnica più SICURA...

Perché la venolisi? -3-



E' la tecnica più SICURA...

Perché la venolisi! -3-

any kind of strategy requires:

- (a) appropriate training;
- (b) appropriate material;
- (c) appropriate methodology;

it is nonetheless evident that :

- the use of obsolete materials and
 - the adoption of an inappropriate methodology
 - out-of-plane puncture in short axis
- were the obvious causes of the unexpected complication



Perché la venolisi! -3-

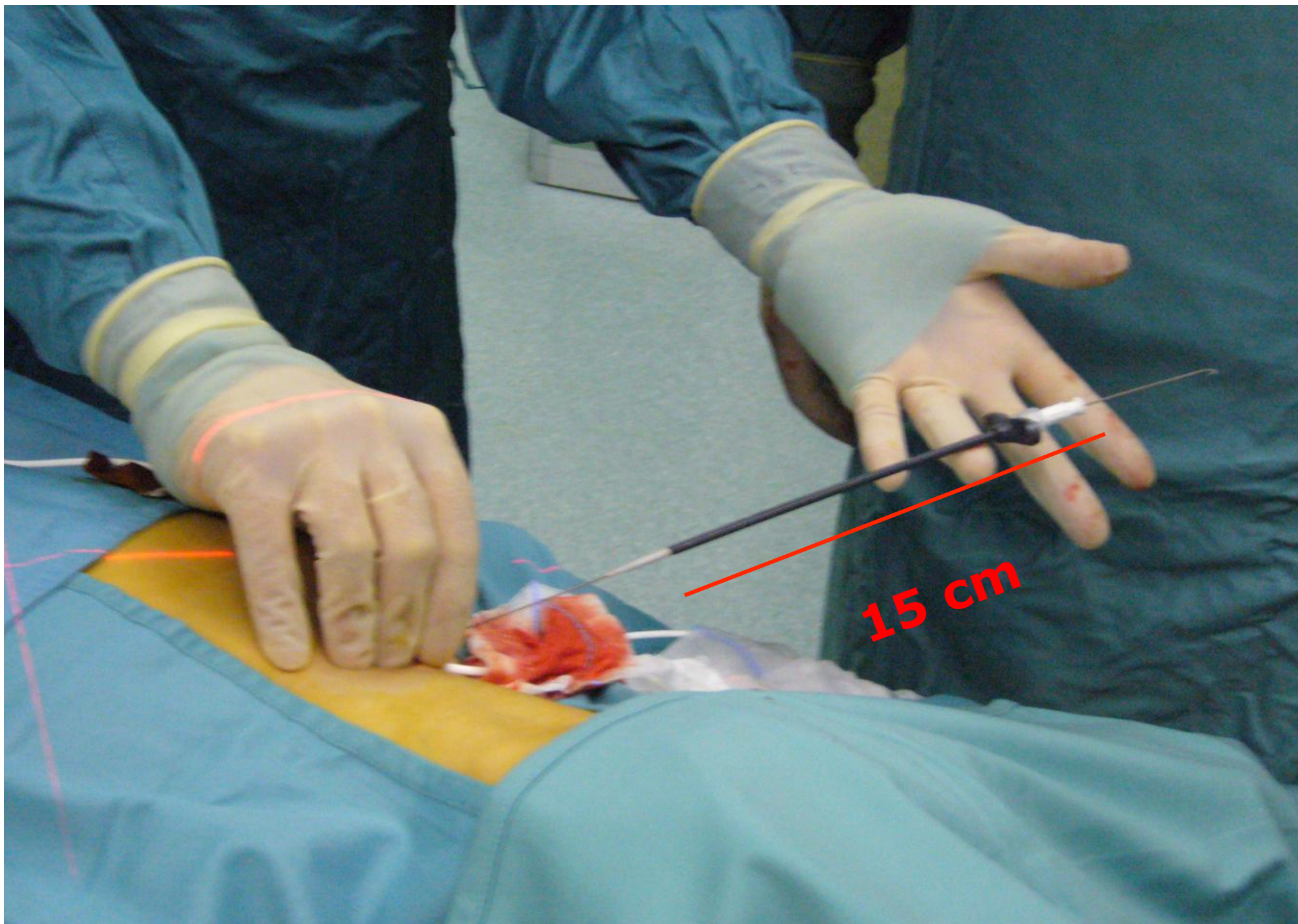
Long axis approach and **in-plane technique** are two different issues.

Safety is based on adoption of the

• **in-plane technique**, which can be used on veins visualized either in **short** or in **long axis**, using appropriately small probes

Central veins of neonates and children should be preferably punctured:

- with **microintroducer kits**
- **by the in-plane technique**



Perché la venolisi! -3-

15 cm



5 cm



Perché la venolisi? -4-

Pediatr Surg Int (2000) 16: 411–413

© Springer-Verlag 2000

ORIGINAL ARTICLE

I. E. Willetts · M. Ayodeji · W. H. Ramsden
R. Squire

Venous patency after open central-venous cannulation

**Le vene si riescono sempre a preparare ed a
incannulare...**

Perché la venolisi? -4-

Pediatr Surg Int (2000) 16: 411–413

© Springer-Verlag 2000

ORIGINAL ARTICLE

I. E. Willetts · M. Ayodeji · W. H. Ramsden
R. Squire

Venous patency after open central-venous cannulation

- ❖ ...on occasion, it may be valuable to recannulate a previously accessed vein...
- ❖ **IT'S OUR POLICY TO REUSE THE PREVIOUSLY ACCESSED IJV FOR REPEATED CVC WHERE POSSIBLE**

Perché la venolisi! -4-

Histologic Changes in the Human Vein Wall Adjacent to Indwelling Central Venous Catheters

Andrew R. Forauer, MD, and Constantine Theoharis, MD

J Vasc Interv Radiol 2003; 14:1163–1168



After short-term catheter placement, focal areas of endothelial injury were seen in the vein wall adjacent to the catheter. Associated thrombus may or may not be present.

Long-term catheters displayed vein wall thickening and bridges from the vein wall to the catheter. These observations represent a progressive reaction of the human vein wall to access devices.

Perché la venolisi! -4-

Journal of Pediatric Surgery 50 (2015) 1928–1932



Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/jped surg



Histological changes of the unligated vein wall adjacent to the central venous catheter after open cutdown in rats[☆]



Seongyup Kim^a, Younglim Kim^b, Suk-Bae Moon^{b,*}

^a Department of General Surgery, Wonju Severance Christian Hospital, Yonsei University Wonju College of Medicine, Wonju, South Korea

^b Department of Surgery, Kangwon National University, Kangwon National University School of Medicine, Chuncheon, South Korea

Perché la venolisi! -4-

Histological changes of the unligated vein wall adjacent to the central venous catheter after open cutdown in rats[☆]



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^b Department of Surgery, Kangwon National University, Kangwon National University School of Medicine, Chuncheon, South Korea

Vascular wall damage causing structural or functional abnormalities after surgical manipulation, either in an artery or a vein, has widely been recognized and **most surgeons perform vascular surgery with minimally invasive techniques and less traumatic instruments.**

Perché la venolisi! -4-

Histological changes of the unligated vein wall adjacent to the central venous catheter after open cutdown in rats[☆]



Seongyup Kim^a, Younglim Kim^b, Suk-Bae Moon^{b,*}

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^b Department of Surgery, Kangwon National University, Kangwon National University School of Medicine, Chuncheon, South Korea

However, even with the most delicate performance and fine instruments, such damage cannot be avoided and the exact cellular mechanisms causing such damage remain unclear.

NEOINTIMAL HYPERPLASIA

Perché la venolisi! -4-

Histological changes of the unligated vein wall adjacent to the central venous catheter after open cutdown in rats[☆]



Seongyup Kim^a, Younglim Kim^b, Suk-Bae Moon^{b,*}

^a Department of General Surgery, Wonju Severance Christian Hospital, Yonsei University Wonju College of Medicine, Wonju, South Korea

^b Department of Surgery, Kangwon National University, Kangwon National University School of Medicine, Chuncheon, South Korea

...circumferential neointimal hyperplasia in the vein and consequent luminal narrowing were caused by smooth muscle cell (SMC) activation, proliferation, and infiltration into the pericatheter sleeve.

NEOINTIMAL HYPERPLASIA

Perché la venolisi! -4-

ASTR

ORIGINAL ARTICLE

pISSN 2288-6575 • eISSN 2288-6796
<https://doi.org/10.4174/astr.2017.92.2.97>
Annals of Surgical Treatment and Research

Inhibitory effect of sustained perivascular delivery of paclitaxel on neointimal hyperplasia in the jugular vein after open cutdown central venous catheter placement in rats

Seongyup Kim*, Younglim Kim^{1,*}, Ji Woong Hwang², Suk-Bae Moon¹

Department of General Surgery, Wonju Severance Christian Hospital, Yonsei University Wonju College of Medicine, Wonju,

¹Department of Surgery, Kangwon National University School of Medicine, Chuncheon, ²Department of Surgery, Eulji University Hospital, Daejeon, Korea



Perché la venolisi! -4-

Inhibitory effect of sustained perivascular delivery of paclitaxel on neointimal hyperplasia in the jugular vein after open cutdown central venous catheter placement in rats

- Paclitaxel is an **antiproliferative agent** that has been demonstrated to inhibit arterial neointimal hyperplasia in various animal models.

Perché la venolisi!-4-

Inhibitory effect of sustained perivascular delivery of paclitaxel on neointimal hyperplasia in the jugular vein after open cutdown central venous catheter placement in rats

- Due to the **substantial toxicity associated with systemic therapy**, vascular applications of paclitaxel have favored local over systemic routes of delivery

Perché la venolisi! -4-

- Yet, for open surgical procedures such as venous cutdowns, **direct, perivascular application of paclitaxel may represent the only reasonable route to deliver the medicine** without associated systemic toxicity

Perché la venolisi! -4-

Inhibitory effect of sustained perivascular delivery of paclitaxel on neointimal hyperplasia in the jugular vein after open cutdown central venous catheter placement in rats



Perché la venolisi! -4-



Techniques in
Vascular and
Interventional
Radiology

Dialysis Catheter Placement in Patients With Exhausted Access

Syed Rahman, MD,^{*} and Joshua D. Kuban, MD[†]



Bambino Gesù
OSPEDALE PEDIATRICO

Perché la venolisi! -4-

Dialysis Catheter Placement in Patients With Exhausted Access

Syed Rahman, MD,^{*} and Joshua D. Kuban, MD[†]

...IF PATENCY OF CONVENTIONAL ACCESS SITES CANNOT BE RE-ESTABLISHED, UNCONVENTIONAL DIALYSIS ACCESS TECHNIQUES ARE NEEDED:

- **TRANSLUMBAR APPROACH**
- **TRANSHEPATIC APPROACH**
- **TRANSRENAL APPROACH**
- **NEEDLE RECANALIZATION**

Perché la venolisi! -4-



Perché la venolisi? -5-

- **Poche risorse impiegate**
- **Materiali poco costosi**
- **Training breve e semplice**

E' la tecnica più ECONOMICA...

Perché la venolisi! -5-

Cost-effectiveness Analysis of Implantable Venous Access Device Insertion Using Interventional Radiologic versus Conventional Operating Room Methods in Pediatric Patients with Cancer

Rebecca Hancock-Howard, PhD, Bairbre L. Connolly, MD, Meghan McMahon, MSc, Anita Menon, MSc, Gloria Woo, PhD, Paul W. Wales, MD, Albert Aziza, MRT(R), BSc, BHA, Audrey Laporte, PhD, Eric Nauenberg, PhD, and Wendy J. Ungar, PhD

E' la tecnica più ECONOMICA...

Perché la venolisi! -5-

Table 4
Description of Complications

Complication	Interventional (n = 30)*	Operative (n = 30)
Insertion site pain, swelling, or oozing	2	4
Blockage/clot	0	2
Infection	0	1
Difficulty accessing port device	0	1
Total*	2	8

* $P = .039$ between groups (χ^2 test).

Table 5
Base Case and Sensitivity Analysis

Parameter	Interventional	Operative	Increment
Base case			
Total cost per 100 patients	2,076,200	2,090,017	-13,817
Complication rate	6.67	26.67	-20.00
Hospital length of stay 0 days			
Total cost per 100 patients	167,210	241,213	-74,003
Complication rate	6.67	26.67	-20.00

Note.—In the base case and the case of a 0-day length of stay (ie, day procedure), the ICER shows interventional radiology to be less costly and more effective than operating room insertion. All costs in 2004 Canadian dollars.

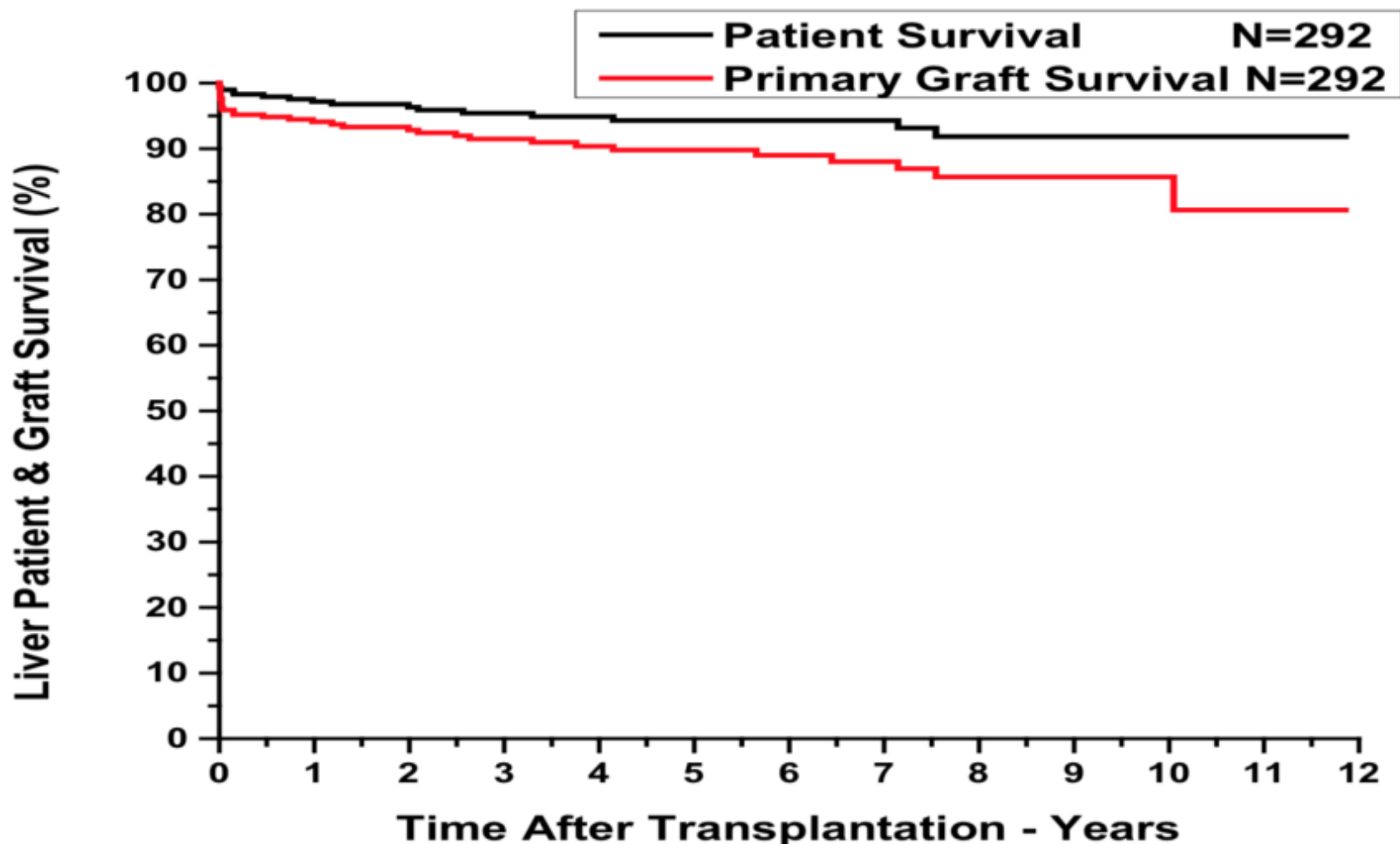
Perché la venolisi! -5-

- **In health care systems in which health care dollars are scarce, it is imperative that the cost effectiveness of costly new technologies be routinely evaluated to justify the significant financial investments required**

Perché la venolisi! -5-

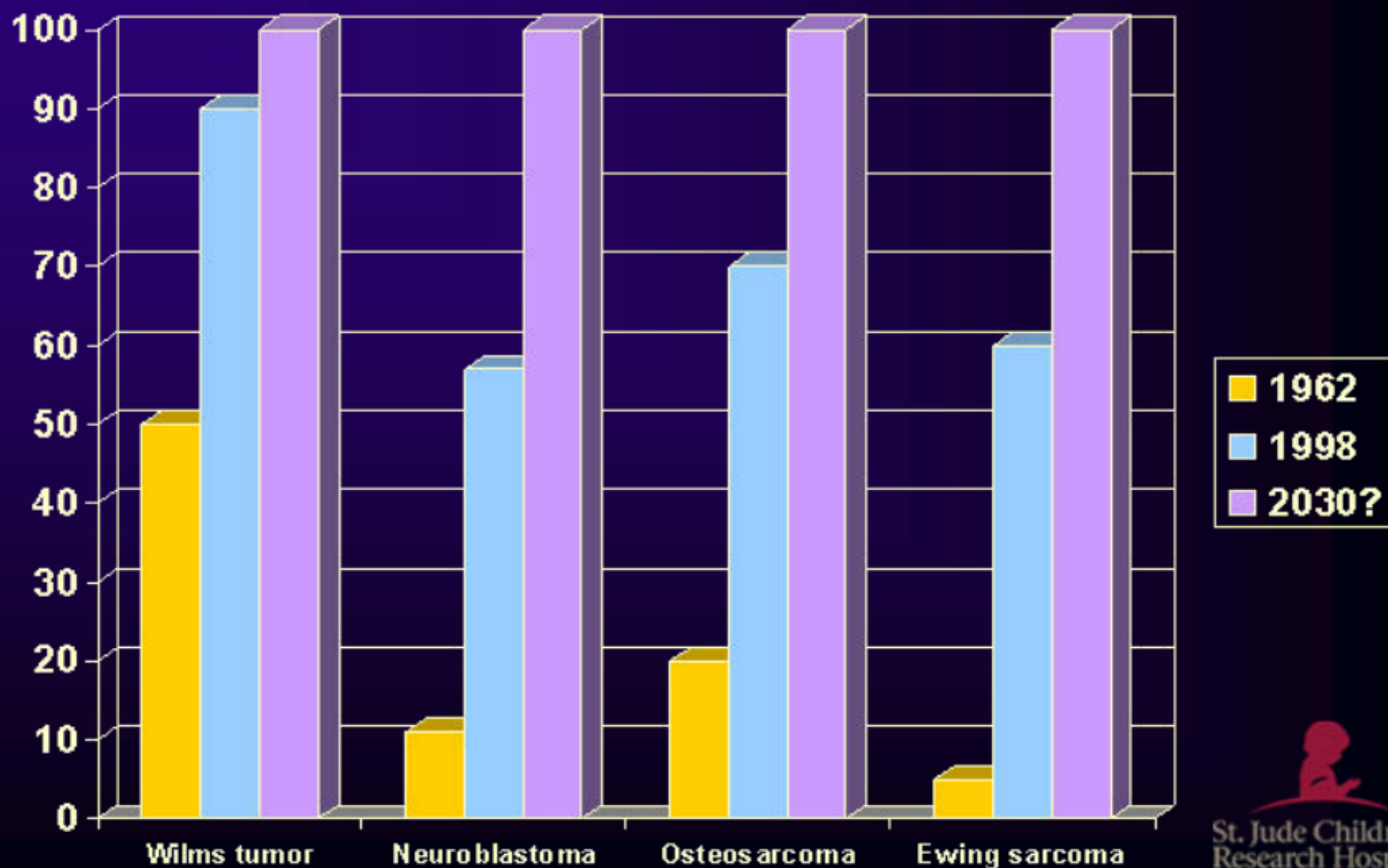
- **Despite a high initial investment, interventional radiology methods were found to be slightly less expensive than traditional surgical methods for central venous access devices insertion**

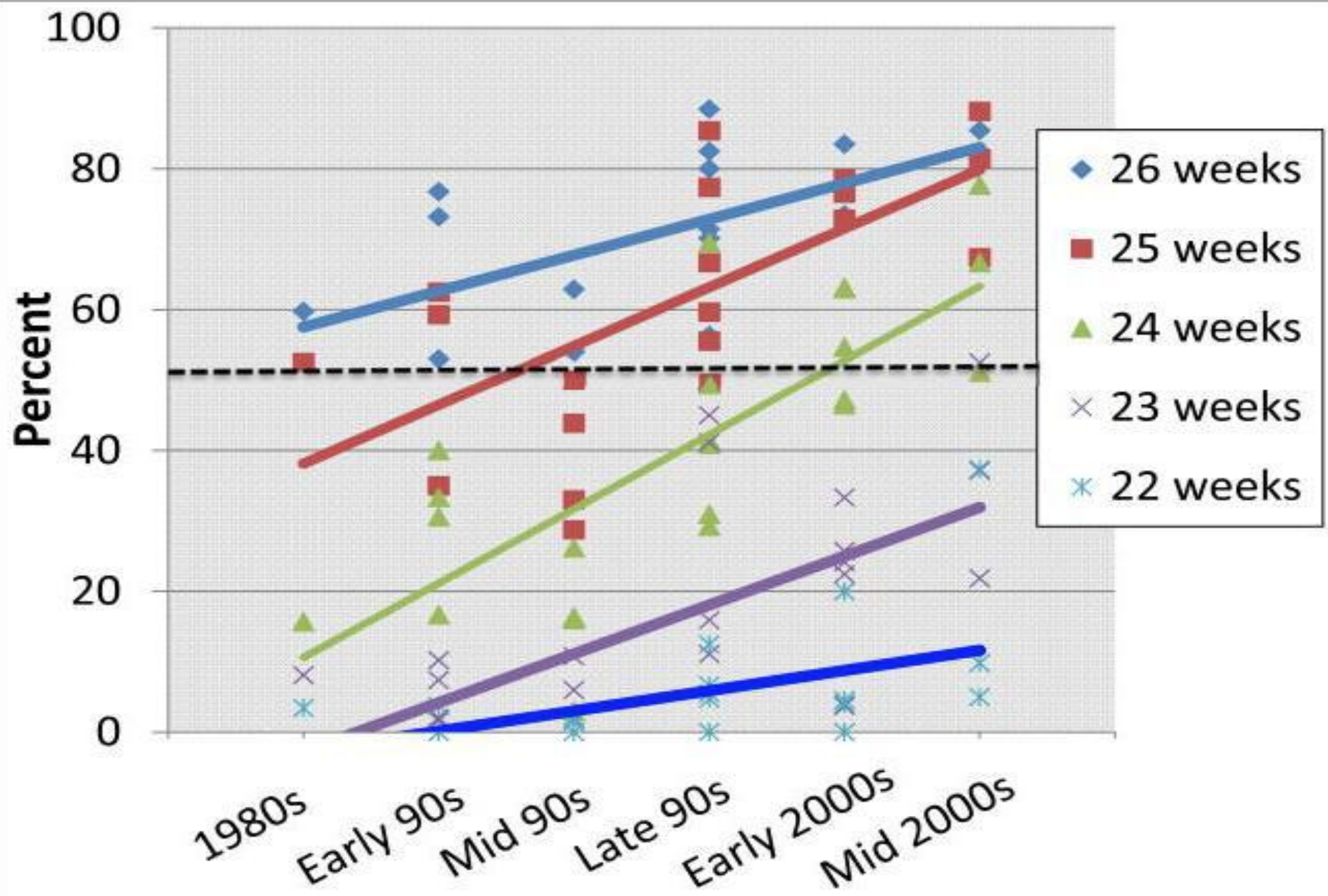
CHP Liver Transplant (2001-Present): Post-transplant Patient & Graft Survival



Organ	Patient survival (%)			Allograft survival (%)		
	1 year	5 year	10 year	1 year	5 year	10 year
Kidney, LD (top), DD (bottom) (1)	98.4	96.1	92.4	96.5	84.3-87	54
	97.4	93.3	86.6	95.1	66-78.0	51
Liver (15)	84-89.8	82-84.8	77	84-93	81-88	75
Heart (13)	80	68	58	86-90	68-75	
Lung (12)	83	54	44 (7 yr)	78-88	35-41	
Intestinal (34)	80-95	77	46	88	74	58

Cancer Survival Rates – 1962 v 1998 v 2030?







Pediatric Vascular Access Practice: Time for Evolution or Revolution?

By Amanda J Ullman RN, MAppSci, PhD, Centaur Fellow, Director-at-Large;
Association for Vascular Access Pediatric Special Interest Group, Senior Lecturer;
Alliance for Vascular Access Teaching and Research (AVATAR) Group, Griffith University

Grazie dell'attenzione!

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