6th Infectivology Today®

L'infettivologia del 3° millennio: AIDS ed altro

VI Convegno Nazionale

15- 16 -17 maggio 2014

Centro Congressi Hotel Ariston
Paestum (SA)

venerdì 16 maggio

Ore 11.30 **SALA MERCURIO**	**"Infezioni correlate a *devices*"** **Presidente:** E. Pizzigallo **Moderatori**: G. De Stefano – G. Foti
Ore 11.30	**"Le infezioni in neurochirurgia"** Relatore: **F.S. Faella** U.O. Malattie Infettive A.O. dei Colli – Osp. D. Cotugno - Napoli
Ore 11.50	**"Le infezioni delle protesi della parete addominale"** Relatore: **S. Colizza** Dipartimento di Chirurgia Osp. Fatebenefratelli - Isola Tiberina - Roma
Ore 12.10	**"Le infezioni dei *devices* intravascolari"** Relatore: **M. Falcone** Istituto di Malattie Infettive Policlinico Umberto I - Roma
Ore 12.30	**"Infezioni degli *stent* ureterali e delle FAV "** Relatore: **M. Tavio** Istituto di Malattie Infettive AOU Ospedali Riuniti - Ancona
Ore 12.50-13.30	Discussione interattiva
Ore 13.30	Light lunch

Infezioni degli stent ureterali e delle FAV

Marcello Tavio

Divisione
Malattie Infettive Emergenti e degli Immunodepressi

AOU "Ospedali Riuniti"

Ancona

Infezioni delle FAV

Hemodialysis infections

Infection is a common malady among hemodialysis patients and is often caused by S. aureus.

Because of the frequent administration of antibiotics to this at-risk population for catheter-related BSIs and extensive health care system exposure, multidrug resistance among strains of S. aureus, enterococci, and gram-negative bacilli has emerged as a serious endemic problem among these patients.

Infection is now the second leading cause of death among patients with end-stage renal disease.

This led the Centers for Disease Control and Prevention and the National Kidney Foundation to establish guidelines for national surveillance and prevention of hemodialysis-associated infections.

Stevenson KB, Hannah EL, Lowder CA, et al. Epidemiology of hemodialysis vascular access infections from longitudinal infec- tion surveillance data: predicting the impact of NKF-DOQI clinical practice guidelines for vascular access. Am J Kidney Dis. 2002;39:549-555.

Tokars JI, Miller ER, Stein G. New national surveillance system for hemodialysis-associated infections: initial results. Am J Infect Control. 2002;30:288-295.

Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011

Clinical Infectious Diseases Advance Access published April 1, 2011

GUIDELINES

Guidelines for the Prevention of Intravascular Catheter-related Infections

Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011

Hemodialysis Catheters. The use of catheters for hemodialysis is the most common factor contributing to bacteremia in dialysis patients [334, 335]. The relative risk for bacteremia in patients with dialysis catheters is sevenfold the risk for patients with arteriovenous (AV) fistulas [336]. AV fistulas and grafts are preferred over hemodialysis catheters in patients with chronic renal failure, due to their lower associated risk of infection. If temporary access is needed for dialysis, a tunneled cuffed catheter is preferable to a non-cuffed catheter, even in the ICU setting, if the catheter is expected to stay in place for >3weeks [59].

Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011

5. Avoid the subclavian site in hemodialysis patients and patients with advanced kidney disease, to avoid subclavian vein stenosis [53,55–58]. Category IA

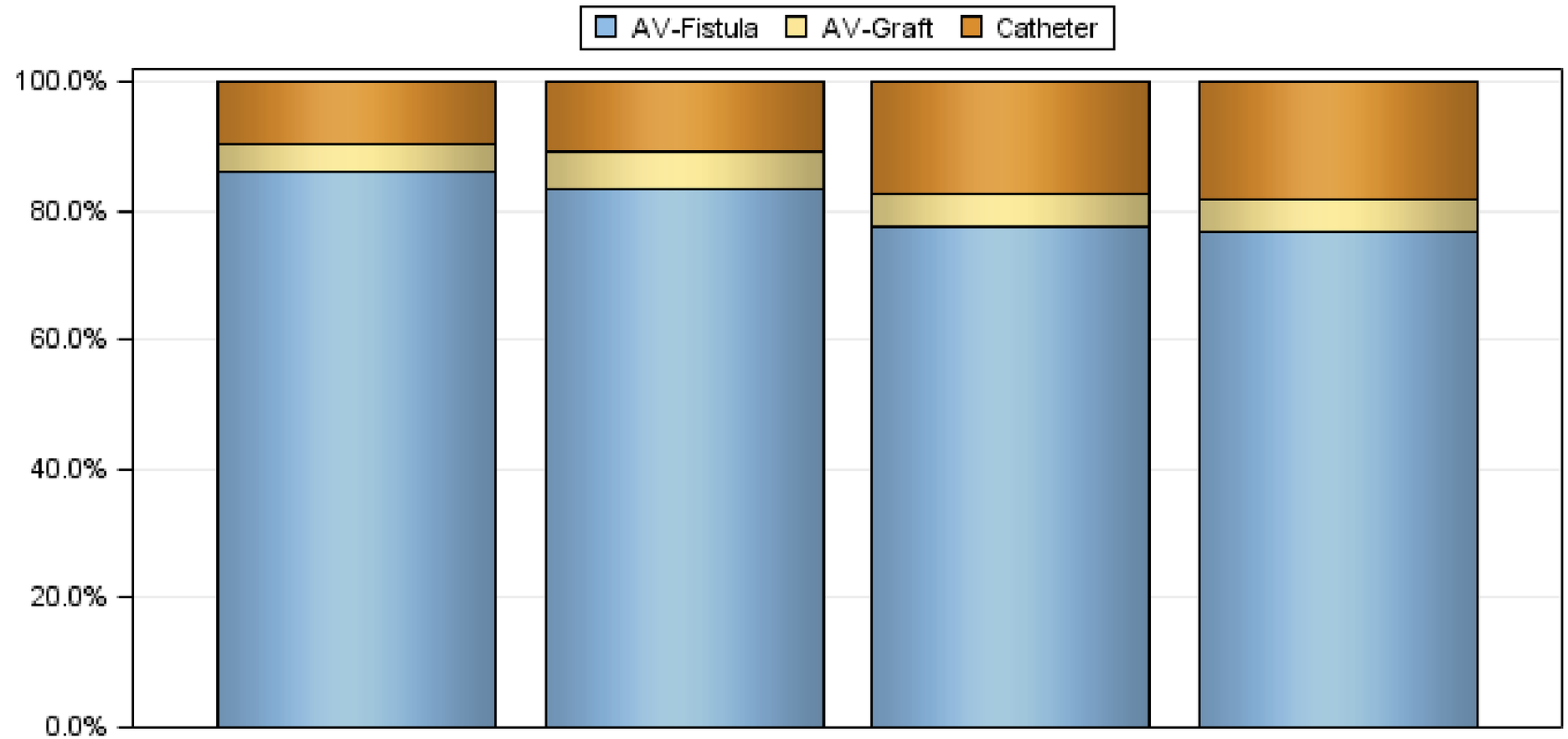
6. Use a fistula or graft in patients with chronic renal failure instead of a CVC for permanent access for dialysis [59]. Category 1A

Antibiotic Lock Prophylaxis, Antimicrobial Catheter Flush and Catheter Lock Prophylaxis

Use prophylactic antimicrobial lock solution in patients with long term catheters who have a history of multiple CRBSI despite optimal maximal adherence to aseptic technique [120– 138]. Category II

IL *REBUS* DEL *"LOCK"* DEL CATETERE VENOSO CENTRALE PER LA PREVENZIONE DELLA TROMBOSI E DELLE BATTERIEMIE DA CATETERE

Mandolfo S.



	D2(2002)	D3(2006)	D4(2010)	D4(2011)
AV-Fistula (N Ptnts)	461	437	438	451
AV-Fistula (Wgtd %)	85.8%	83.3%	77.4%	76.7%
AV-Graft (N Ptnts)	20	27	22	24
AV-Graft (Wgtd %)	4.6%	5.6%	5.0%	4.9%
Catheter (N Ptnts)	55	61	113	114
Catheter (Wgtd %)	9.6%	11.0%	17.6%	18.4%

Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011

The most commonly reported causative pathogens remain coagulase-negative staphylococci, Staphylococcus aureus, enterococci, and *Candida* spp [208]. Gram negative bacilli accounted for 19% and 21% of CLABSIs reported to CDC [209] and the Surveillance and Control of Pathogens of Epidemiological Importance (SCOPE) database, respectively [208].

For all common pathogens causing CLABSIs, antimicrobial resistance is a problem, particularly in ICUs. Although methicillin-resistant *Staphylococcus aureus* (MRSA) now account for more than 50% of all *Staphylococcus aureus* isolates obtained in ICUs, the incidence of MRSA CLABSIs has decreased in recent years, perhaps as a result of prevention efforts [210]. For gram negative rods, antimicrobial resistance to third generation cephalosporins among *Klebsiella pneumoniae* and E. coli has increased significantly as has imipenem and ceftazidine resistance among *Pseudomonas aeruginosa* [209]. *Candida* spp. are increasingly noted to be fluconazole resistant.

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

MMWR™
MORBIDITY AND MORTALITY WEEKLY REPORT

April 27, 2001 / Vol. 50 / No. RR-5

Recommendations and Reports

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Bacterial Infections

Epidemiology

Disease Burden. The annual mortality rate among hemodialysis patients is 23%, and infections are the second most common cause, accounting for **15% of deaths** (1). Septicemia (10.9% of all deaths) is the most common infectious cause of mortality. In various studies evaluating rates of bacterial infections in hemodialysis outpatients, bacteremia occurred in 0.63%–1.7% of patients per month and vascular access infections (with or without bacteremia) in 1.3%–7.2% of patients per month (162–170). National surveillance data indicated that 4%–5% of patients received intravenous vancomycin during a 1-month period (and additional patients received other antimicrobials) (18). Although data on vancomycin use can be used to derive an estimate of the prevalence of suspected infections, the proportion of patients receiving antimicrobials who would fit a formal case definition for bacterial infection is unknown.

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Bacterial Infections

Infection Sites. In a study of 27 French hemodialysis centers, 28% of 230 infections in hemodialysis patients involved the vascular access, whereas 25% involved the lung, 23% the urinary tract, 9% the skin and soft tissues, and 15% other or unknown sites (165). Thirty-three percent of infections involved either the vascular access site or were bacteremias of unknown origin, many of which might have been caused by occult access infections. Thus, the vascular access site was the most common site for infection, but accounted for only one-third of infections. However, access site infections are particularly important because they can cause disseminated bacteremia or loss of the vas- cular access.

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Bacterial Infections

Vascular Access Infections.

Vascular access infections are caused (in descending order of frequency) by S. aureus, coagulase-negative staphylococci (CNS), gram- negative bacilli, nonstaphylococcal gram-positive cocci (including enterococci), and fungi (171). The proportion of infections caused by CNS is higher among patients dia- lyzed through catheters than among patients dialyzed through fistulas or grafts.

The primary risk factor for access infection is access type, with catheters having the highest risk for infection, grafts intermediate, and native arteriovenous (AV) fistulas the lowest (168). Other potential risk factors for vascular access infections include a) loca- tion of the access in the lower extremity; b) recent access surgery; c) trauma, hematoma, dermatitis, or scratching over the access site; d) poor patient hygiene; e) poor needle insertion technique; f) older age; g) diabetes; h) immunosuppression; and i) iron over- load (164,167,172–175).

Risk Factors for Polytetrafluoroethylene (PTFE) Graft Infection

- Need for repetitive percutaneous cannulation
- Breaks in sterile technique during cannulation
- Poor patient hygiene
- Prolonged postdialysis bleeding from the graft
- Perigraft hematoma formation
- Surgical manipulation of graft
- Human immunodeficiency virus (HIV) coinfection
- Lower extremity (thigh) graft
- Bacteremia or fungemia caused by an ectopic site of infection

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Bacterial Infections

Transmission. Bacterial pathogens causing infection can be either exogenous (i.e, acquired from contaminated dialysis fluids or equipment) or endogenous (i.e., caused by invasion of bacteria present in or on the patient). Exogenous pathogens have caused numerous outbreaks, most of which resulted from inadequate dialyzer reprocessing procedures (e.g., contaminated water or inadequate disinfectant) or inadequate treat- ment of municipal water for use in dialysis. During 1995–1997, four outbreaks were traced to contamination of the waste drain port on one type of dialysis machine (176). Recommendations to prevent such outbreaks are published elsewhere (171).

Contaminated medication vials also are a potential source of bacterial infection for patients. In 1999, an outbreak of Serratia liquefaciens bloodstream infections and pyro- genic reactions among hemodialysis patients was traced to contamination of vials of erythropoietin. These vials, which were intended for single use, were contaminated by repeated puncture to obtain additional doses and by pooling of residual medication into a common vial (177).

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Bacterial Infections

Transmission. Endogenous pathogens first colonize the patient and later cause infection. Colonization means that microorganisms have become resident in or on the body (e.g., in the nares or stool); a culture from the site is positive, but no symptoms or signs of infection exist. Colonization with potentially pathogenic microorganisms, often unknown to staff members, is common in patients with frequent exposure to hospitals and other health- care settings. Colonization most often occurs when microorganisms are transmitted from a colonized or infected source patient to another patient on the hands of health- care workers who do not comply with infection control precautions. Less commonly, contamination of environmental surfaces (e.g., bed rails, countertops) plays a role (178).

Infection occurs when microorganisms invade the body, damaging tissue and caus- ing signs or symptoms of infection, and is aided by invasive devices (e.g., the hemodi- alysis vascular access). Evidence exists that when prevalence of colonization in a population is less frequent, infection in that population will also be less frequent, and infection control recommendations for hemodialysis units are designed to prevent colo- nization (179). Additional measures designed to prevent infection from colonizing or- ganisms (e.g., using aseptic technique during vascular access) are presented elsewhere (180).

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Bacterial Infections

Antimicrobial Resistance

Antimicrobial-resistant bacteria are more common in patients with severe illness, who often have had multiple hospitalizations or surgical procedures, and in those who have received prolonged courses of antimicrobial agents. In health-care settings, in- cluding hemodialysis centers, such patients can serve as a source for transmission.

Clinically important drug-resistant bacteria that commonly cause health-care– associated infections include MRSA, methicillin-resistant CNS, VRE, and multidrug- resistant gram negative rods, including strains of Pseudomonas aeruginosa, Stenotrophomonas maltophilia, and Acinetobacter species, some of which are resis- tant to all available antimicrobials. In addition, strains of S. aureus with intermediate resistance to vancomycin and other glycopeptide antibiotics have recently been re- ported; these strains are called vancomycin-intermediate S. aureus (VISA) or glyco- peptide-intermediate S. aureus (GISA) (181,182). Intermediate resistance to vancomycin is reported even more frequently among CNS (183,184).

Hemodialysis patients have played a prominent role in the epidemic of vancomycin resistance. In 1988, a renal unit in London, England, reported one of the first cases of VRE (185). In three studies, 12%–22% of hospitalized patients infected or colonized with VRE were receiving hemodialysis (178,186,187). Furthermore, three of the first five patients identified with VISA (or GISA) were on chronic hemodialysis, and one had received acute dialysis (182).

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Bacterial Infections

Vancomycin Use

Dialysis patients have played a prominent role in the epidemic of vancomycin resistance because this drug is used commonly in these patients, in part because vancomycin can be conveniently administered to patients when they come in for hemodialysis treatments. However, two studies indicate that cefazolin, a first-generation cephalosporin, could be substituted for vancomycin in many patients (190,191). One of these studies reported that many pathogens causing infections in hemodialysis patients are susceptible to cefazolin (190), and both studies reported therapeutic cefazolin blood levels 48–72 hours after dosing, making in-center administration three times a week after dialysis feasible.

Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients

Prevention and Management of Bacterial Infections

Follow published guidelines for judicious use of antimicrobials, particularly vancomycin, to reduce selection for antimicrobial-resistant pathogens (*202*). Infection control precautions recommended for all hemodialysis patients (see Recommended Practices at a Glance) are adequate to prevent transmission for most patients infected or colonized with pathogenic bacteria, including antimicrobial-resistant strains. However, additional infection control precautions should be considered for treatment of patients who might be at increased risk for transmitting pathogenic bacteria. Such patients include those with either a) an infected skin wound with drainage that is not contained by dressings (the drainage does not have to be culture positive for VRE, MRSA, or any specific pathogen) or b) fecal incontinence or diarrhea uncontrolled with personal hygiene measures. For these patients, consider using the following additional precautions: a) staff members treating the patient should wear a separate gown over their usual clothing and remove the gown when finished caring for the patient and b) dialyze the patient at a station with as few adjacent stations as possible (e.g., at the end or corner of the unit).

MANAGEMENT

Preservation of the vascular access site is a major consideration when making management decisions regarding PTFE graft infections because other potential venous access sites have been frequently exhausted in these patients.

Parenteral antimicrobial therapy is curative in selected cases of early graft infection, and graft removal is not required.

The presence of purulence or abscess in the immediate graft area or aneurysmal graft formation mandates graft removal.

Old, thrombosed, nonfunctioning grafts should be resected when infection at this nidus is confirmed.

Three to 4 weeks of parenteral antimicrobial therapy, directed by in vitro susceptibility testing, is recommended.

In patients with SAB, transesophageal echocardiography to exclude infective endocarditis should be performed.

L'INFEZIONE DELL'ACCESSO VASCOLARE NELL'EMODIALIZZATO

Brunori G.

Vascular access infection in patients on hemodialysis

Infection is a serious complication of catheter use and is associated with high complication and mortality rates. Gram-positive cocci (in particular Staphylococcus aureus and coagulase-negative staphylococci) are the leading cause of bloodstream infections. Due to the increasing prevalence of drug-resistant bacteria the management of these infections can be difficult. Preservation of the catheter can be obtained in case of infection due to coagulase-negative staphylococci, using a combination of antibiotic lock therapy and systemic antibiotic treatment. Catheter preservation is rarely possible in cases of Staphylococcus aureus bloodstream infection because of frequent relapse and the risk of endocarditis, osteomyelitis and septic arthritis.

G ITAL NEFROL 2012; 29 (S56): S49-S55

Physical examination: How to examine the arm with arteriovenous fistula

Sousa CN et al.

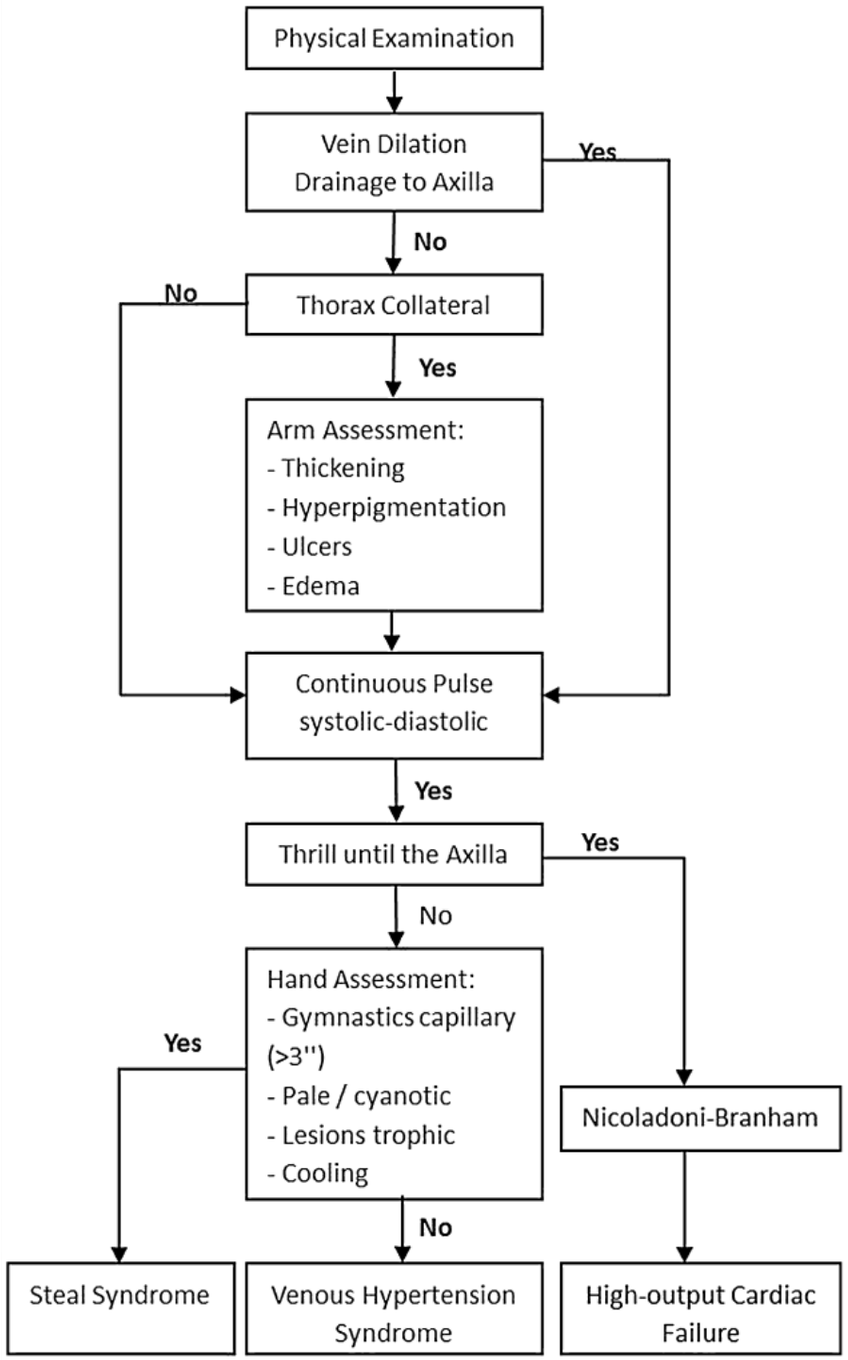


Figure 1 Flowchart of identification of steal syndrome, high-output cardiac failure, and venous hypertension.

Infection

In most people, the signs of infection of the AVF, are recognized by physical examination, through inspection. It is identified in the area surrounding the AVF and/or punctures: redness, erythema, edema, cellulitis, purulent drainage, and the existence of wounds.[5,22,24]

Regarding to palpation, we can recognize increasing temperature in the area surrounding the AVF and/or punctures, presence of edema, presence of abscess,[5] and hardening or fluctuations of the site of the abscess and/or puncture area.[24] The infection may not be easy to diagnose, when coupled with hematomas, abscesses or aneurysms related to puncture sites. This complication may occur after the construction of the AVF by direct contamination; for breaches of aseptic technique for insertion of needles or access review processes (surgery, angiography, and angioplasty). However, palpation of the appropriate arm of the AVF can help detect this complication.

Hemodialysis International 2013; **17**:300–306

Associations between Hemodialysis Access Type and Clinical Outcomes: A Systematic Review

Ravani P et al.

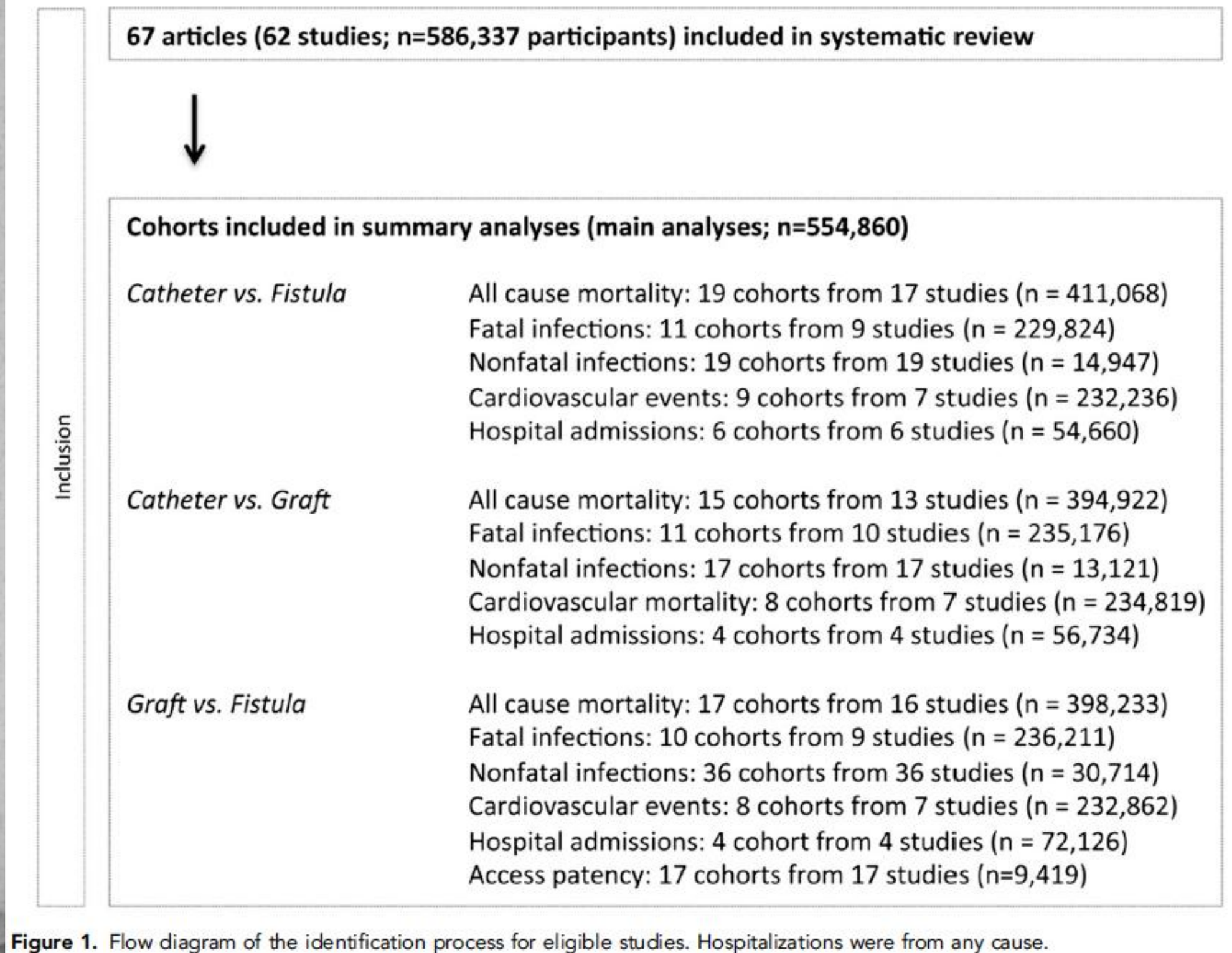
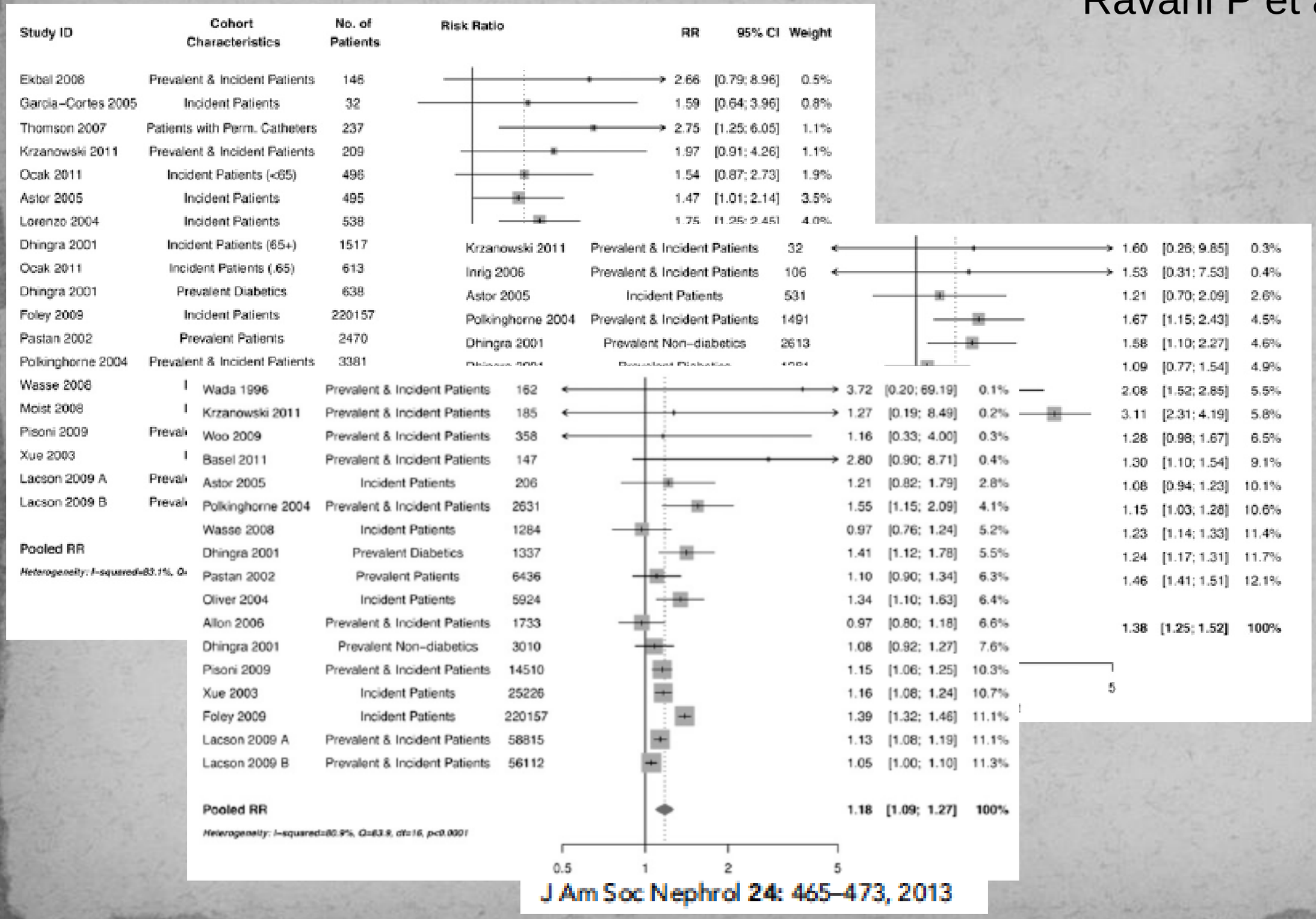


Figure 1. Flow diagram of the identification process for eligible studies. Hospitalizations were from any cause.

Associations between Hemodialysis Access Type and Clinical Outcomes: A Systematic Review

Ravani P et al.



J Am Soc Nephrol 24: 465–473, 2013

Associations between Hemodialysis Access Type and Clinical Outcomes: A Systematic Review

Ravani P et al.

Table 1. Summary of absolute risks of death from all causes, major cardiovascular events, and fatal infections associated with dialysis vascular access types

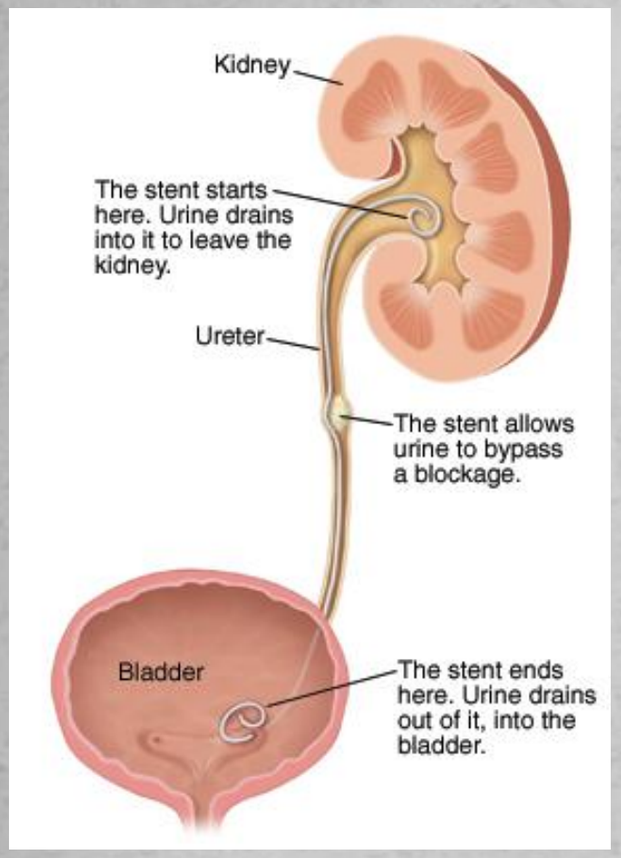
Reference Annual Event Risk[a]	Vascular Access Comparison	Meta-Analytical RR (95% CI)	Heterogeneity (I^2; *P* Value)	Number of Additional Events per 1000 Patients Exposed per Year (95% CI)
All-cause mortality				
0.20 for fistula users	Catheter versus fistula	1.53 (1.40–1.67)	83.9%; <0.01	106 (80–134) excess with catheter
0.24 for graft users	Catheter versus graft	1.38 (1.25–1.52)	86.2%; <0.01	91 (60–125) excess with catheter
0.20 for fistula users	Graft versus fistula	1.18 (1.09–1.27)	82.1%; <0.01	36 (18–54) excess with graft
Major cardiovascular events				
0.10 for fistula users	Catheter versus fistula	1.38 (1.24–1.54)	0%; 0.47	38 (24–54) excess with catheter
0.11 for graft users	Catheter versus graft	1.26 (1.11–1.43)	0%; 0.57	28 (12–46) excess with catheter
0.10 for fistula users	Graft versus fistula	1.07 (0.95–1.21)	0%; 0.52	7 (−5–21)[b] excess with graft
Fatal infections				
0.03 for fistula users	Catheter versus fistula	2.12 (1.79–2.52)	0%; 0.82	28 (20–38) excess with catheter
0.04 for graft users	Catheter versus graft	1.49 (1.15–1.93)	0%; 0.23	17 (5–32) excess with catheter
0.03 for fistula users	Graft versus fistula	1.36 (1.17–1.58)	0%; 0.78	9 (4–15) excess with graft

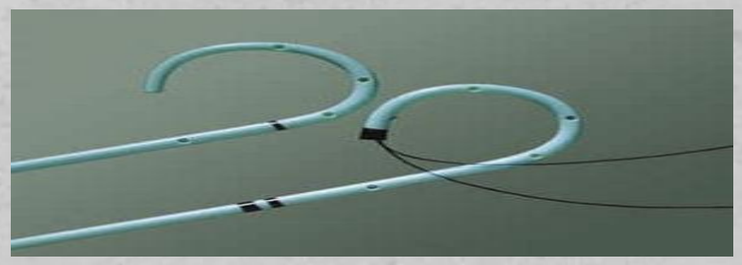
[a]Outcome measure includes all-cause mortality, fatal or nonfatal cardiovascular events, and fatal infection events as defined in each study, with RRs obtained from the meta-analysis. Reference risks are from the United States Renal Data System.[1]

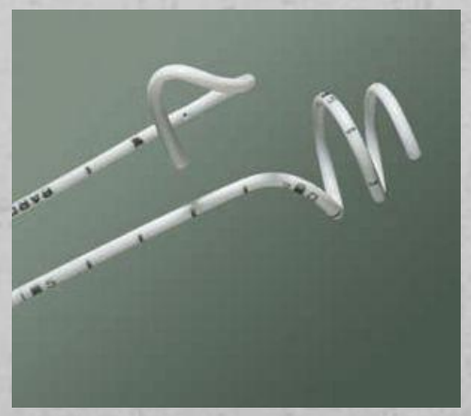
[b]The 95% CI includes negative numbers, indicating that the superiority of graft versus fistula for cardiovascular events is uncertain (the 95% CI ranges between 5 fewer events and 21 in excess with grafts).

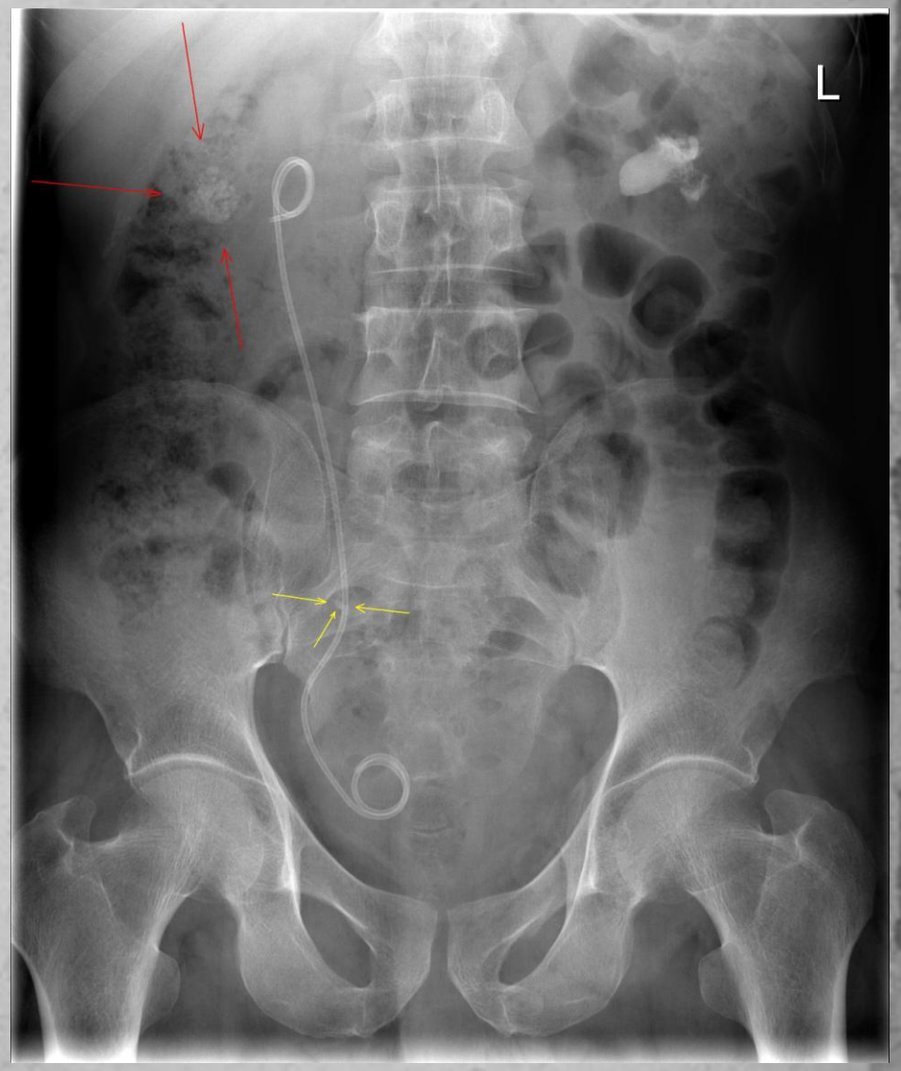
J Am Soc Nephrol 24: 465–473, 2013

Infezioni degli stent ureterali









Nephroureteral Stents: Principles and Techniques

Makramalla A et al.

Semin Interven Rad 28 (4):367-379
2011

Nephroureteral stents including antegrade, retrograde, or internal (double-J) stents are routinely placed by interventional radiologists.

The purpose of this review is to provide a detailed and comprehensive description of indications, contraindications, technique, and various technical challenges of these procedures.

Also pre- and post-procedure management of patients will be discussed including routine follow-up and dealing with potential complications.

Nephroureteral Stents: Principles and Techniques

Semin Interven Rad 28 (4):367-379
2011

Makramalla A et al.

RETROGRADE (TRANSILEAL CONDUIT) NEPHROURETERAL STENT PLACEMENT

A retrograde nephroureteral stent (RNUS) is a catheter placed in patients who have undergone surgical treatment, such as cystectomy with ileal conduit formation in which it exits from the conduit and extends retrograde to the renal pelvis.

Antegrade Placement of a Retrograde Nephroureteral Stent

If the patient has a PCN, this can be converted to a RNUS. However, if the patient does not have a PCN, then antegrade access should be performed first.

ANTEGRADE PERCUTANEOUS INTERNAL/EXTERNAL NEPHROURETERAL STENTS

An antegrade percutaneous internal/external nephroureteral (PCNU) stent is placed percutaneously, establishing antegrade access to the kidney, ureter, and urinary bladder. A segment of the stent remains outside the patient from the flank, which can be capped or connected to gravity drainage. The internal/external catheter provides continuity between the kidney, ureter, and urinary bladder, which is useful in patients with ureteric obstruction, injury, fistulas or those undergoing ureteral surgery.The second retrograde method is a one-step approach, which includes direct placement of the stent through the ileal conduit.

Nephroureteral Stents: Principles and Techniques

A et al.

Semin Interven Rad 28 (4):367-379
2011

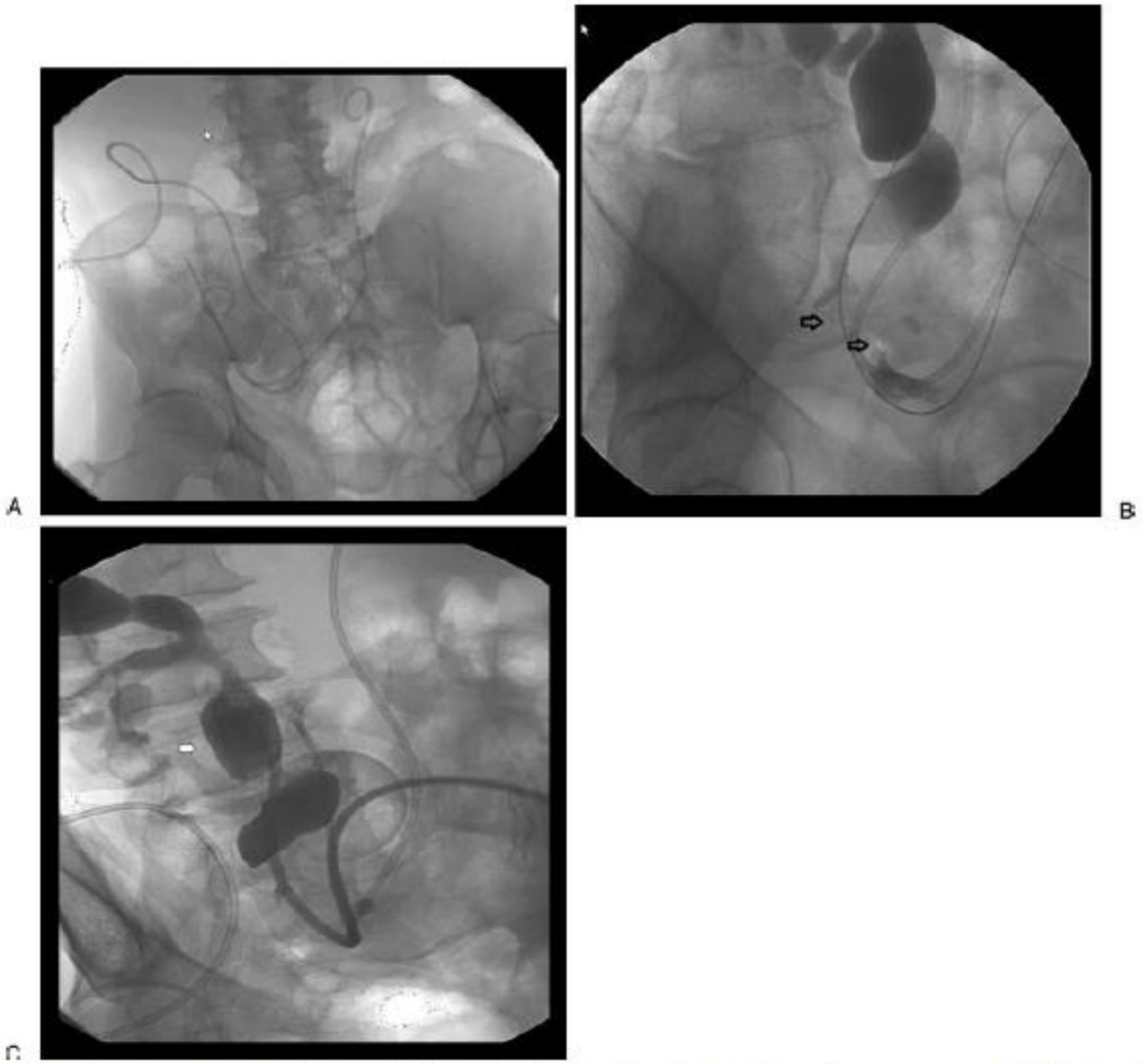


Figure 1 Patient in prone position with ileal conduit has a right retrograde nephroureteral stent (RNUS) and a left percutaneous internal/external nephroureteral (PCNU) that is to be exchanged for a RNUS. (A) Shows right RNUS and left PCNU. (B) The patient is in lateral oblique position, the left PCNU has been removed over a wire and contrast injection shows left hydronephrosis and a stricture (arrows) in the lower end of the left ureter. (C) Final image shows the final RNUS with a loop formed within the renal pelvis (white arrow).

Nephroureteral Stents: Principles and Techniques

Semin Interven Rad 28 (4):367-379 **2011**

A et al.

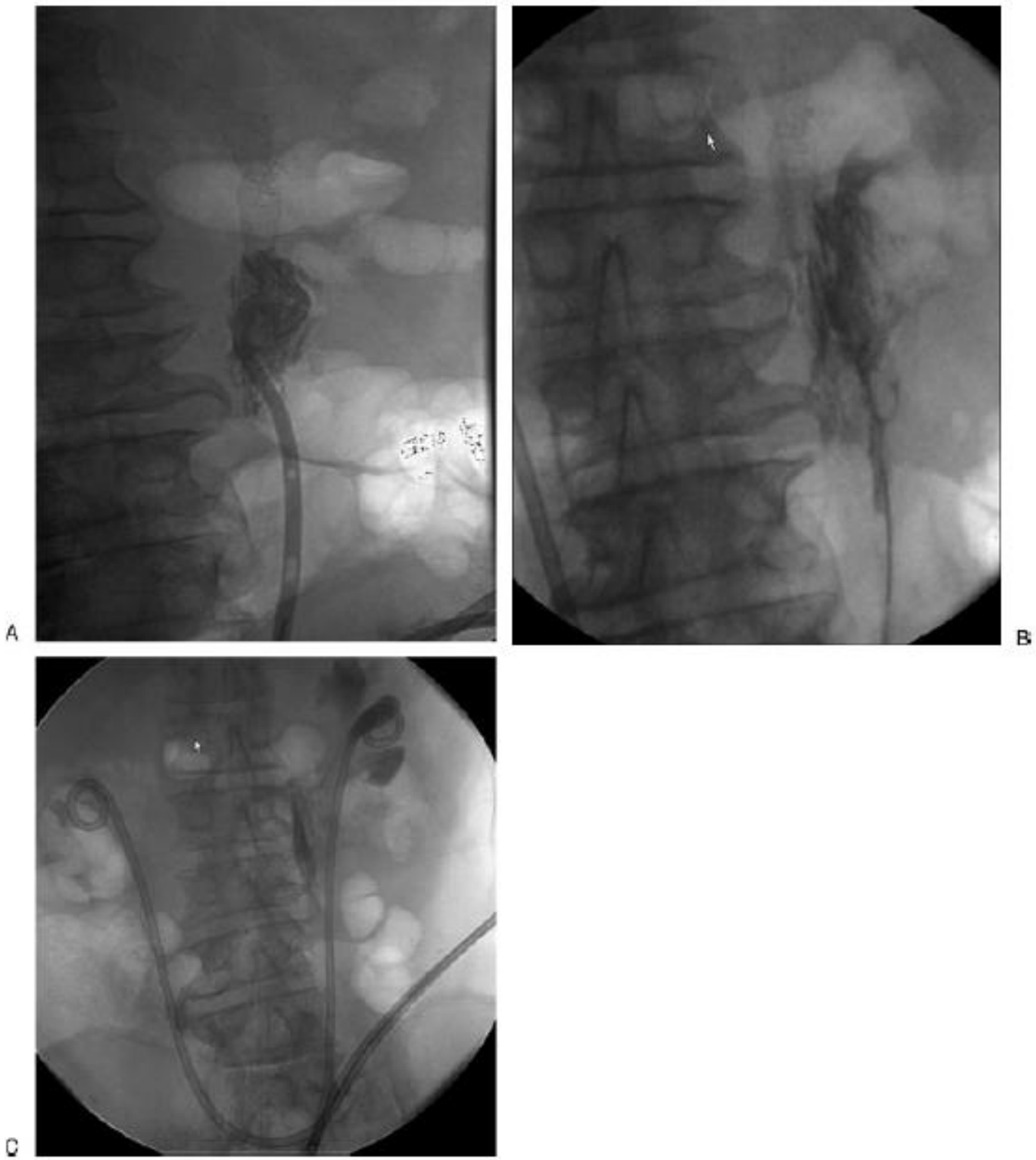


Figure 3 Patient with ileal conduit and bilateral retrograde nephroureteral stent (RNUS) presenting for routine stent change. (A) Images after placement of the new stent reveal that the loop is retroperitoneal, most likely due to perforation by the catheter during catheter exchange. (B) The stent was removed over a wire and used in combination with an MPA catheter to reaccess the ureter. (C) Final image shows the new catheter with the loop within the pelvicaliceal system. There were no adverse clinical consequences after this exchange.

Nephroureteral Stents: Principles and Techniques

Semin Interven Rad 28 (4):367-379
2011

et al.

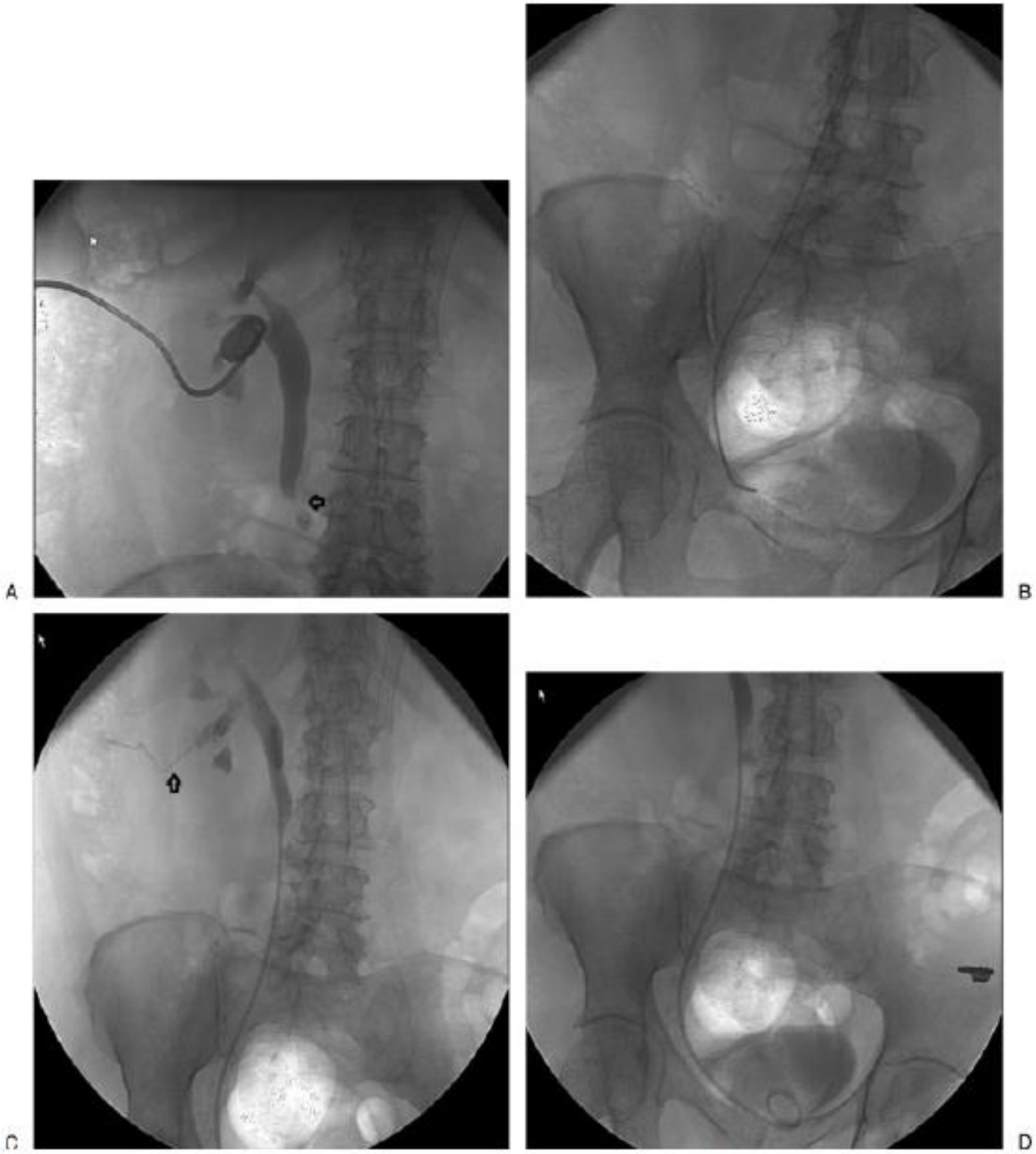


Figure 4 Patient has a left percutaneous internal/external nephroureteral (PCNU) stent that is to be changed to a double-J stent. (A) A contrast study shows ureteropelvic junction obstruction. (B) A catheter has been successfully manipulated down the ureter into the urinary bladder. The catheter position is confirmed by contrast injection. (C) Final image after a double-J stent insertion showing a proximal loop formed within the renal pelvis. The small arrow indicates a tractogram that clearly identifies a well-formed tract between the kidney and the skin. (D) The distal loop is adequately formed within the urinary bladder.

Effect of ureteric stents on urological infection and graft function following renal transplantation

World J Transplant 2013 March 24; 3(1): 1-6

Jacob A Akoh, Tahawar Rana

Background

Stents are used to protect the joining between the transplant ureter and the recipient's bladder when performing kidney transplantation in order to avoid or reduce complications. It is thought that using a stent in this way does not elimi- nate the risk of complications, particularly urinary leak may in fact increases the risk of urological or blood stream infections. As a result, opinion continues to be divided between those who routinely stent and those who only do so selectively on the basis of clear indications.

Research frontiers

There are several reports on the effect of ureter stenting for kidney transplant recipients but the key issues such as how long it should be retained in the body before removal, its effect on kidney function remain unanswered. There are also no well conducted randomised controlled trials to assess the effect of stents.

Innovations and breakthroughs

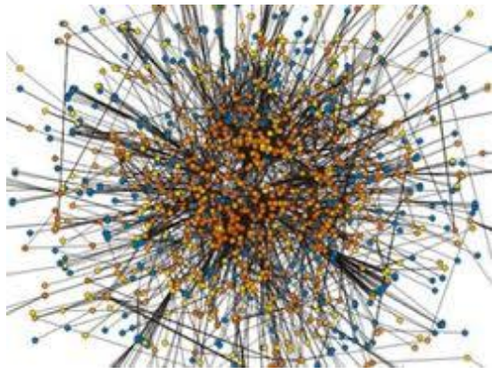
Proponents of selective stenting state that the associated risks are high enough to avoid routine stenting and advocate that careful surgical technique with selective stenting of problematic anastomoses yields similar results. The key question is to determine what effect the increased risk of urological infection with stenting has on the early and medium term outcome of renal transplantation. In the present study, authors compared the incidence of urological infection in patients with or without stents inserted at transplantation and report the effect of urinary tract infections (UTIs) in the early post transplantation period on short and medium term graft function.

Applications

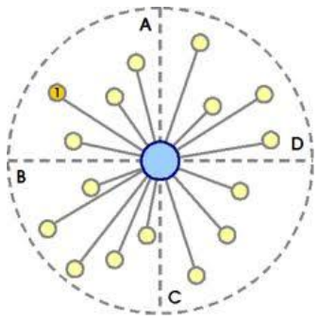
This study suggests that stents increase the risks of urological infections and have a detrimental effect on early to medium term kidney transplant function. It calls for a controlled trial to determine the optimum duration of retaining stents following insertion.

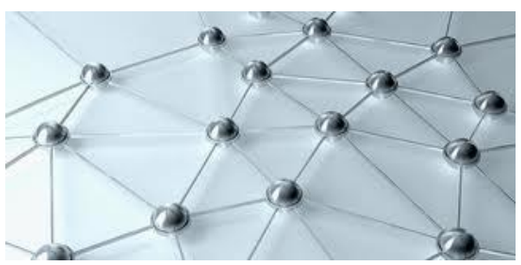
San Francisco è la città in cui le minoranze sono la maggioranza

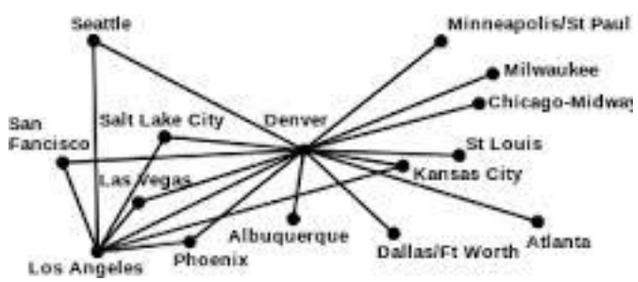
La forza di una catena è condizionata dall’anello più debole

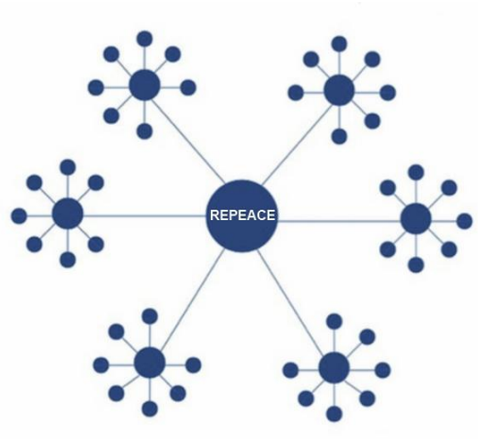


Note per un modello di rete infettivologica peer-to-peer (Internet-like non-hub&spoke)



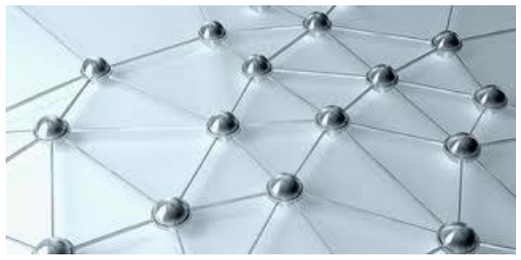




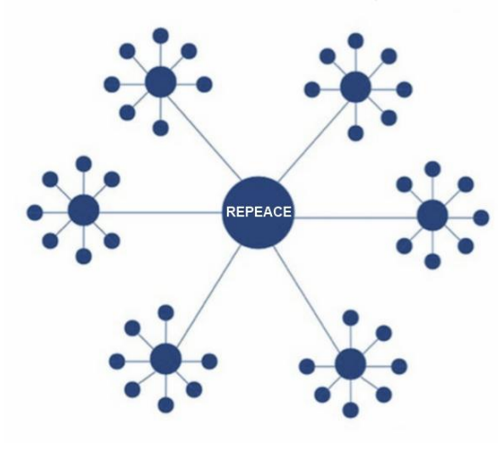


Peer-to-peer (**P2P**), in informatica, è un'espressione che indica un'architettura logica di rete informatica in cui i nodi non sono gerarchizzati unicamente sotto forma di client o server fissi (clienti e serventi), ma sotto forma di *nodi equivalenti* o *paritari* (in inglese *peer*) che possono cioè fungere sia da cliente che da servente verso gli altri nodi terminali (host) della rete. Essa dunque è un caso particolare dell'architettura logica di rete client-server.

by Wikipedia, 31 marzo 2014



Note per un modello di rete infettivologica peer-to-peer (Internet-like non-hub&spoke)



135/00

patologia complessa = struttura complessa

- Non è la bassa prevalenza di patologia infettiva globale ad aver messo in crisi il modello di MI uscito dalla 135/90, quanto la mancanza di pazienti con bisogni infettivologici “esclusivi”, quali per l’appunto i “vecchi” pazienti con HIV/AIDS.

- Gli infettivologi, dopo aver trascorso 3 decenni come “uniproprietari” dei pazienti e della patologia da HIV/AIDS, devono abituarsi a stare nel consiglio di amministrazione delle altre specialità mediche e chirurgiche come soci di minoranza...

- ...ma senza rinunciare al peso specifico strutturale (immagine inclusa) insito nella necessità di gestire una patologia complessa, con strumenti adeguati.

- Le MI oggi (ai tempi delle KPC-fine-antibioticoterapia) non sono meno complesse di ieri (ai tempi di HIV/AIDS-viaggio-di-sola-andata).

- In una trattativa costruttiva e libera da pregiudizi con il Direttore generale che disponga nella “propria” Azienda di un’area di emergenza e un variabile numero reparti medici e chirurgici correlati (con il minimo di posti letto che giustifichino la sussistenza di una tale struttura...300?), l’assioma di partenza è: *se in questo nosocomio si affrontano problemi infettivologici complessi, una struttura complessa di Malattie Infettive - con o senza posti letto - è la soluzione più ragionevole a costi sostenibili.*

- Laddove la 135/90 abbia già stabilito, seppure in altri tempi e con altri fini, la presenza di una struttura operativa complessa di MI, l’obiettivo è difendere - con o senza posti letto - la sua qualifica, a qualsiasi costo.

135/00

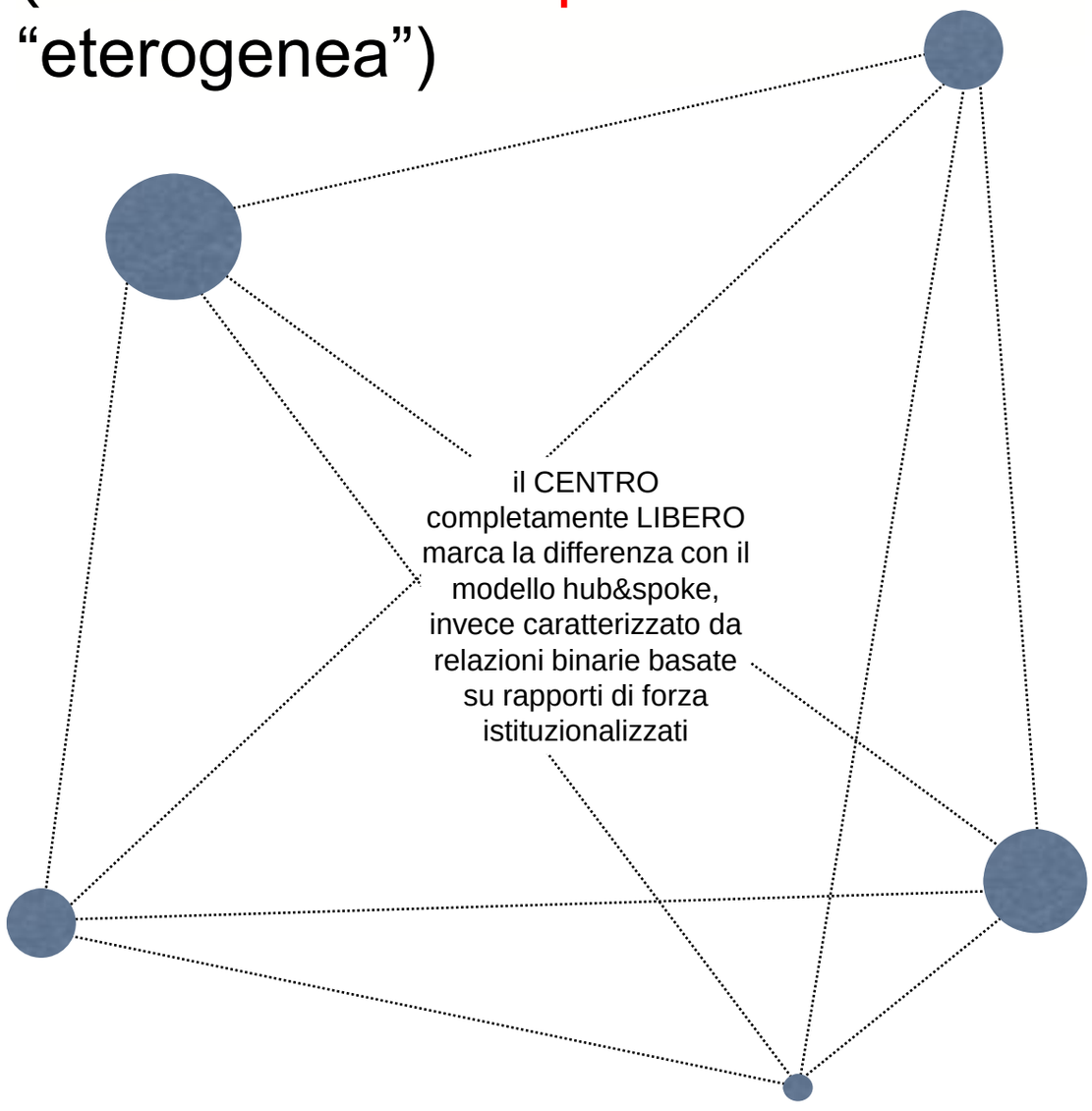
patologia complessa
=
struttura complessa

rete esterna formata da **nodi** con livello gerarchico elevato (S.O. **C**omplessa), unica disciplina (Malattie Infettive), due tipologie gestionali (con o senza posti letto)

dalla rete esterna sono esclusi: S.O. **S**. di MI, Alte Specialità di MI, referenti esterni anche se infettivologi, strutture e discipline non-MI

rete
poco invasiva
e di rapida attuazione...che punta sulla malattia
piuttosto che sul malato

nodale (monostruttura infettivologica),
e una interna, intra-nodale
(ad architettura dipartimentale "eterogenea")



in linea con la piena affermazione della complessità della patologia infettivologica e contro il rischio di balcanizzazione e bignamizzazione della disciplina

rete "demand-sensitive": massima flessibilità nella risposta a stimoli epidemiologici improvvisi o altre esigenze strutturali all'esterno della rete

rete "resource-sensitive": massima plasticità nella risposta alla ridistribuzione di risorse e competenze all'interno della rete

rete interna formata da ogni struttura o risorsa, umana o tecnologica, potenzialmente interessata e pienamente compliante, incluse SOS e AS di MI, referenti esterni di MI anche se non-infettivologi, altre strutture e discipline non-MI

l'articolazione della rete esterna è prerogativa delle strutture di MI che ne fanno parte, senza coinvolgimento di strutture terze (che possono essere coinvolte solo tramite il nodo di riferimento). Così facendo si sgancia il funzionamento della rete esterna da istituzioni o interlocutori estranei alla comunità infettivologica

l'articolazione della rete interna è prerogativa di ogni singolo nodo: la performance dipende da numero e qualità delle strutture a disposizione e dall'effettiva capacità di interconnetterle... un nodo iper-connesso al proprio interno assume maggiore importanza anche nella rete esterna

Note per un modello di rete infettivologica peer-to-peer (Internet-like non-hub&spoke)

Rete di reti

- Il modello di rete ideale è Internet, “rete di reti” ideata e costruita per resistere a un attacco nucleare.

- Nel caso di Internet i “nodi” hanno entità variabili ma sono in grado di processare, con volumi diversi, le medesime informazioni; in altre parole, ogni nodo è in grado di rappresentare la “rete” nel punto in cui si trova. Se riproducibile anche in ambito medico-infettivologico, questo modello potrebbe risultare altrettanto vincente.

- Il modello hub&spoke è basato su un trasferimento di risorse e carichi di lavoro unidirezionale e istituzionalizzato; con il tempo questo sistema evolve rinforzando il centro a danno della periferia. Il modello peer-to-peer è basato principalmente sul traffico di dati e competenze a seconda di dove si concentrano i bisogni e la capacità di soddisfarli; questo sistema tende a far crescere tutti i nodi, a seconda delle necessità e delle risorse disponibili, e risulta ugualmente accettabile al “piccolo” come al “grande”.

- Il modello peer-to-peer è il modello più economico e meritocratico in assoluto, in quanto premia chi coniuga al meglio volume di attività e capacità innovativa.

Rete di due reti

- Rete di 2 reti: una interna e una esterna al nodo di rete; nodo di rete rappresentato dalla SOC di MI; SOC di MI che può avere o non avere posti letto a disposizione in esclusiva, ma che non può essere subordinata (come nel caso di SOS/SOSD) a strutture terze, pena la perdita della capacità di svolgere il ruolo pivotale che è ingrediente indispensabile per far funzionare una rete (qualsiasi rete).

- Nessuna SOS/SOSD è in grado di assolvere il compito di nodo propriamente detto, perchè manca della autonomia necessaria rispetto al contesto in cui è inserita.

- Esiste una dimensione minima delle Strutture-di-Malattie-Infettive-in-grado-di-formare-una-rete che è quella compatibile con una capacità di risposta h24 (oppure, in altre parole, la capacità di governare la complessità nel punto operativo in cui agisce il nodo della rete).

- Se queste premesse sono corrette il modello minimo di Malattie Infettive per la costruzione della rete è costituito da una struttura in grado di effettuare una turnazione completa, indipendente, h24, anche senza posti letto e con una dotazione infermieristica estremamente ridotta (ad esempio: 4 MD di cui un direttore di II livello, i 2 turni infermieristici coperti diurni - in capo a una Medicina o a una Direzione sanitaria - un'unità amministrativa).

- La costruzione della rete infettivologica interna al nodo, è importante tanto quanto l'esterna (e forse di più); la sua strutturazione dovrebbe idealmente precedere quella della rete esterna, ma nulla vieta che si riesca a costruirle contemporaneamente, travasando modelli ed esperienze dimostratisi efficaci e riproducibili in altri nodi di rete.

Evidenziare la complessità della patologia infettiva...

- prevalenza della patologia infettivologica (fino al 20% di pazienti ospedalizzati nell'unità di tempo presentano un'affezione infettivologica rilevante dal punto di vista diagnostico o terapeutico);
- universalità di utilizzo della terapia anti-infettiva (fino al 50% dei pazienti ospedalizzati assumono o hanno assunto terapia anti-infettiva nell'unità di tempo considerata);
- pericolosità (oggettiva e/o percepita) di alcune patologia infettive diffusive (TB, meningiti, AIDS) e con variabili necessità contumaciali;
- pan-resistenza alle terapie disponibili di ceppi di microrganismi estremamente diffusi e patogenetici.

... ostacola balcanizzazione e bignamizzazione della disciplina.

- *balcanizzazione*: ovvero l'aggregazione delle sindromi infettivologiche alle specializzazioni organo-specifiche;
- *bignamizzazione*: ovvero la semplificazione cui è necessario ricorrere nel caso l'infettivologia venga fatta "rientrare" nell'alveo della medicina interna.

135/00

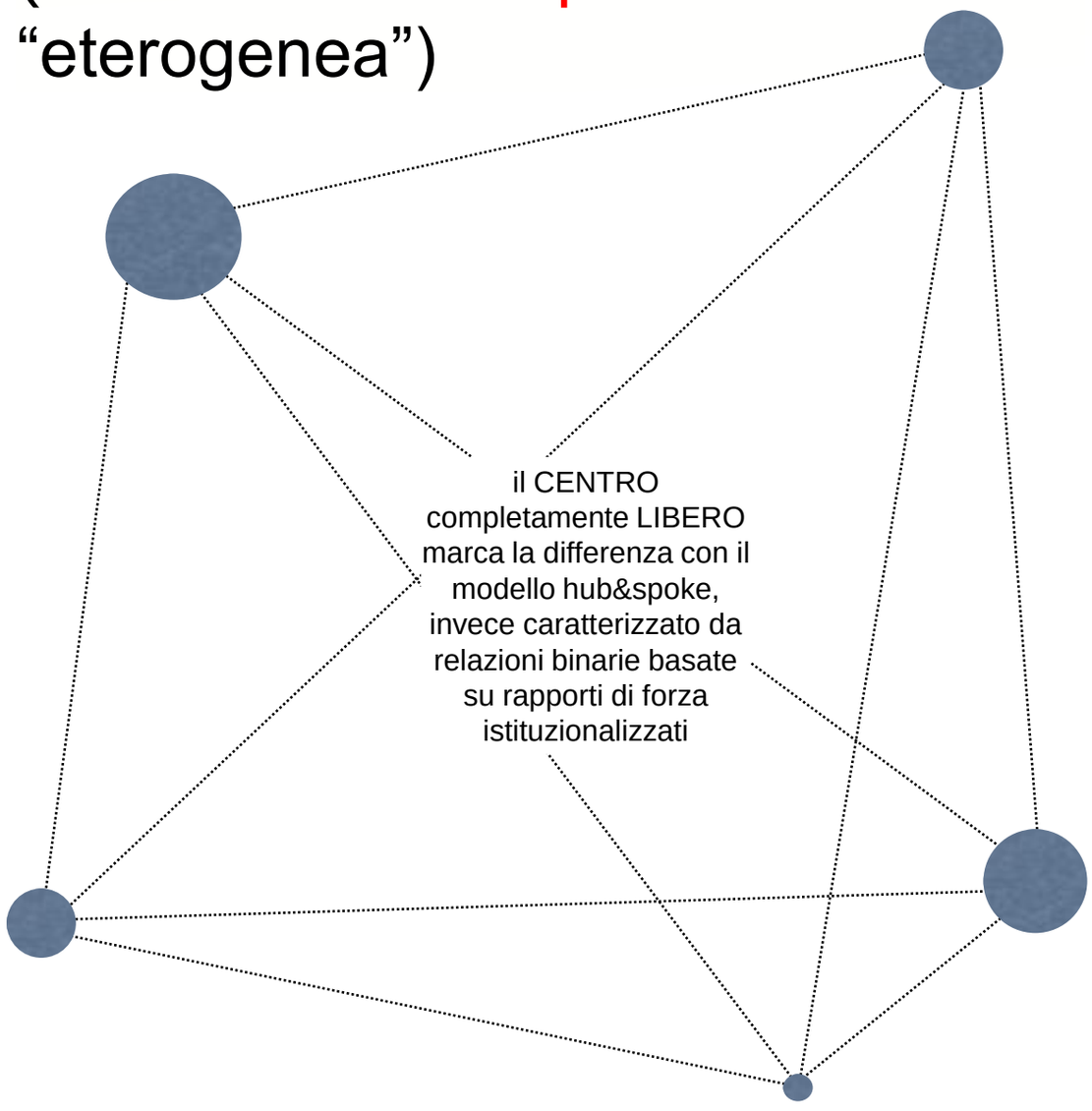
patologia complessa
=
struttura complessa

rete esterna formata da **nodi** con livello gerarchico elevato (S.O. **C**omplessa), unica disciplina (Malattie Infettive), due tipologie gestionali (con o senza posti letto)

dalla rete esterna sono esclusi: S.O. **S**. di MI, Alte Specialità di MI, referenti esterni anche se infettivologi, strutture e discipline non-MI

rete
poco invasiva
e di rapida attuazione...che punta sulla malattia
piuttosto che sul malato

nodale (monostruttura infettivologica),
e una interna, intra-nodale
(ad architettura dipartimentale "eterogenea")



in linea con la piena affermazione della complessità della patologia infettivologica e contro il rischio di balcanizzazione e bignamizzazione della disciplina

rete "demand-sensitive": massima flessibilità nella risposta a stimoli epidemiologici improvvisi o altre esigenze strutturali all'esterno della rete

rete "resource-sensitive": massima plasticità nella risposta alla ridistribuzione di risorse e competenze all'interno della rete

rete interna formata da ogni struttura o risorsa, umana o tecnologica, potenzialmente interessata e pienamente compliante, incluse SOS e AS di MI, referenti esterni di MI anche se non-infettivologi, altre strutture e discipline non-MI

l'articolazione della rete esterna è prerogativa delle strutture di MI che ne fanno parte, senza coinvolgimento di strutture terze (che possono essere coinvolte solo tramite il nodo di riferimento). Così facendo si sgancia il funzionamento della rete esterna da istituzioni o interlocutori estranei alla comunità infettivologica

l'articolazione della rete interna è prerogativa di ogni singolo nodo: la performance dipende da numero e qualità delle strutture a disposizione e dall'effettiva capacità di interconnetterle... un nodo iper-connesso al proprio interno assume maggiore importanza anche nella rete esterna

Note per un modello di rete infettivologica peer-to-peer (Internet-like non-hub&spoke)

Note per un modello di rete infettivologica peer-to-peer (Internet-like non-hub&spoke)