

Peritoneale Dialyse Richtlijnen

Voor deze PD richtlijnen hebben de 'EBPG guidelines on peritoneal dialysis' als basis gediend, gepubliceerd in NDT 2005, vol 20, december supplement 9. In dit document zijn alleen de richtlijnen samengevat. Voor de onderbouwing en de referenties wordt verwezen naar de volledige tekst van de EBPG richtlijnen, te downloaden van http://ndt.oxfordjournals.org/content/vol20/suppl_9/index.dtl

De kwaliteitscommissie van de NfN heeft de richtlijnen beoordeeld en waar nodig commentaar toegevoegd, vanwege recente wetenschappelijke ontwikkelingen of indien nodig vanwege de praktijk in Nederland.

Een richtlijn Monitoring adequaatheid en membraanfunctie bij peritoneale dialyse is afzonderlijk ontwikkeld. <http://www.nefro.nl/home/richtlijnen>

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Geen belangenverstrengeling

De richtlijn bevat aanbevelingen van algemene aard. Het is mogelijk dat in een individueel geval deze aanbevelingen niet van toepassing zijn. Het is de verantwoordelijkheid van de behandelend arts te beoordelen of de richtlijn in de praktijk toepasbaar is. Er kunnen zich feiten of omstandigheden voordoen waardoor, in het belang van een goede zorg voor de patiënt, van een richtlijn moet worden afgeweken.

In de richtlijn zijn de volgende Evidence levels gebruikt:

Levels of evidence	
Level A	Evidence obtained from meta-analysis of several randomized controlled trials, or from at least one randomized controlled study
Level B	Evidence obtained from well-conducted clinical studies, but no randomized controlled trials. The evidence may be extensive, but is essentially descriptive
Level C	Evidence obtained from expert committee reports or opinions, and/or clinical experience of respected authorities

1. General guidelines

Guidelines

- 1A.** A unit offering peritoneal dialysis (PD) should provide not only continuous ambulatory peritoneal dialysis (CAPD) but also automated peritoneal dialysis (APD), in all its forms. It should have access to adequate back-up haemodialysis (HD) facilities and renal transplantation.
- 1B.** All equipment used in the delivery and monitoring of therapies should comply with the relevant standards for medical electrical equipment (BS-EN 60601-239:1999, BS5724-2-39:1998, IEC 60601-2-39:1998, Particular requirements for the safety - specification for peritoneal dialysis equipment). Tubing sets and catheters should carry the "CE" mark to indicate that the item conforms to the essential requirements of the Medical Devices Directive (93/42/EEC) and that its conformity has been assessed in accordance with the directive.

2. The initiation of dialysis

Guidelines

- 2A.** Patients with chronic renal failure should be referred to a nephrologist when on two consecutive measurements, plasma creatinine exceeds 150 $\mu\text{mol/L}$ (1.7 mg/dL) in men or 120 $\mu\text{mol/L}$ (1.4 mg/dL) in women or if there is proteinuria, to assess renal function more precisely and initiate treatment and dietary counselling.
(Evidence level C)
- 2B.** Renal function should never be estimated from measurements of plasma urea or creatinine alone, but should include an assessment of GFR.
(Evidence level B)
- 2C.** The preferred method for calculating GFR in advanced renal failure is the mean of urea and creatinine clearance. The latter is best calculated from a 24 hour urine collection and normalised to 1.73 m².
(Evidence level B)
- 2D.** Conservative treatment should be aimed at slowing the progression of renal failure, decreasing proteinuria, strict control of blood pressure, prevention of overhydration,

treatment of anaemia, renal bone disease, and metabolic acidosis. Detection of protein-energy malnutrition requires active dietary counselling.

In patients with diabetes mellitus, tight blood glucose controls should be encouraged. Hepatitis vaccinations should be considered. The effects must be assessed regularly. The various options of renal replacement therapy have to be discussed in a timely fashion with the patients.

(Evidence level C)

When GFR has declined to 15 mL/min/1.73 m² the assessments should be intensified to about once monthly with special attention to control of hypertension, fluid overload, biochemical abnormalities, and management of malnutrition. Access surgery should be planned.

(Evidence level C)

- 2E. Dialysis should be instituted whenever evidence of uraemia is present, or blood pressure and hydration status cannot be controlled, or when a deterioration of the nutritional status is noticed. In any case dialysis should be started before the GFR is less than 6 mL/min/1.73 m² (creatinine clearance 8 mL/min/1.73 m²).**

(Evidence level C)

To ensure that dialysis is not started at a GFR of less than 6 mL/min/1.73 m², initiation at the level between 8 to 10 mL/min should be considered. Diabetic patients may require an earlier start.

Commentaar:

Voor het moment van starten dialyse wordt verwezen naar de multidisciplinaire richtlijn predialysebehandeling 2009.

3. Peritoneal access

Guidelines

- 3A. Each centre should have a dedicated team involved in implantation and care of catheters.**
(Evidence level A)
- 3B. Each centre should analyse its catheter survival and complications: reasonable targets should include a catheter survival of more than 80% at one year and peritonitis rate of not more than one-episode/24 patient-months.**
(Evidence level C)
- 3C. Whenever possible the catheter insertion should be performed at least 2 weeks before starting peritoneal dialysis. Small dialysate volumes in the supine position can be used if dialysis is required during this period.**
(Evidence level C)
- 3D. Catheters should preferably be implanted operatively or by laparoscopy but the Seldinger technique in selected cases can achieve comparable outcomes.**
(Evidence level A/B)

Commentaar 3D:

Afhankelijk van de ervaring van de chirurg, verbonden aan het centrum.

- 3E. Antibiotic prophylaxis should be done preoperatively with a first generation cephalosporin.**
(Evidence level A)

Commentaar 3E:

De kwaliteitscommissie adviseert antibiotische profylaxe toe te passen op basis van het resistentiepatroon.

Een eerstegeneratie cefalosporine is het meest gebruikt als profylactisch antibioticum in dit verband, maar is soms te smal. In een gerandomiseerde trial bleek vancomycine (eenmalig 1 gr iv) beter dan cefalosporine (eenmalig 1 gr iv) in het voorkomen van vroege peritonitis (Gadallah 2000). De odds ratio van peritonitis zonder antibiotische profylaxe was 11.6, voor cefalosporine (vs vancomycine) 6.45. Het voordeel van het geringere infectierisico moet worden afgewogen tegen het risico van het mogelijk bevorderen van resistente micro-organismen tegen vancomycine.

- 3F. Post implantation care should consist of aseptic management of the exit site during the healing phase. A dressing should be done aiming for immobilisation of the catheter to avoid trauma and bleeding in the exit site.**
(Evidence level C)
- 3G. The dressing should not be changed more than once a week during the first 2 weeks, unless bleeding occurs or infection is suspected.**
(Evidence level C)
- 3H. Either during the early post-implantation care and after the healing period the exit site should be kept dry. Therefore occlusive dressings should not be used. When dressings are used after the healing period, daily changes are recommended**
(Evidence level C)
- 3I. Use of mupirocine or gentamicin cream at the exit-site, is recommended to reduce exit-site infections.**
(Evidence level A)

Commentaar 3I:

Voor exit-site verzorging wordt verwezen naar de richtlijn huidpoortverzorging van de LVDT.
http://www.lvd.nl/cms/files/Richtlijn_huidpoortverzorging_pd_katheter_V2_dec06.pdf

NfN richtlijn PD-gerelateerde infecties.

<http://www.nefro.nl/uploads/6y/mb/6ymb3ASlqwnBj7rGmYMtNw/Richtlijn-PD-gerelateerde-infecties.2007.pdf>

Er zijn geen gerandomiseerde trials waarin verschillende methoden van huidpoortverzorging worden vergeleken, huidpoortverzorging zelf is bewezen effectief. Preventie van katheterinfecties (en dus van peritonitis) is het primaire doel van exit-siteverzorging.

Antibiotische protocollen tegen S aureus zijn effectief om het risico van S aureus katheterinfecties te verminderen (Evidence) (Strippoli JASN 2004, Tacconelli 2003, Strippoli AJKD 2004, Amato 2001, Lye 1994 (1), Lye 1993, Bernardini 1996, Bernardini 2005, Herwaldt 2003, Lobbedez 2004, Perez-Fontan 2002, Mupirocin Study Group 1996, Zimmerman 1991, Oxtan 1994, Vychytil 1998, Wong 2003, Zeybel 2003, Piraino 2003, Perez-Fontan 1992). Een aantal protocollen voor preventie van S aureus PD-gerelateerde infecties zijn onderzocht (tabel 1).

Tabel 1. Antibiotische opties voor de preventie van exit-site infecties

1. Mupirocine op de exit-site:

- a. *Dagelijks bij alle patiënten*
- b. *Dagelijks alleen bij dragers*
- c. *Bij een positieve exit-site kweek op S aureus*

2. Intranasaal mupirocine dagelijks (hoeft niet 2 x p dag) gedurende 5-7 dagen:

- a. Iedere maand, wanneer de patiënt neusdrager is
 - b. Alleen wanneer de neuskweek positief is
3. Gentamicine crème dagelijks bij alle patiënten op de exit-site

Eventueel op geleide van kweken, het liefst vastgelegd in een lokaal protocol opgesteld in samenwerking met de microbioloog. Bij resistentievorming kan het gebruik van fusidinezuur worden overwogen.

- 3J. Exit-site infections should be treated according to the guidelines of the International Society for Peritoneal Dialysis.**
(Evidence level C)
Topical treatment should be applied in equivocal cases or as adjuvant therapy.
(Evidence level C)
- 3K. Catheter removal for exit site infection should be considered (1) when a peritonitis episode with the same microorganism is present, 2) if antibiotic treatment is unsuccessful (3) and in case of recurrent exit-site infections with the same organism.**
(Evidence level C)
- 3L. Mechanical complications, such as herniae, leakage, and obstruction should be managed according to the recommendations of the International Society for Peritoneal Dialysis.**
(Evidence level C)

4. Continuous Ambulatory Peritoneal Dialysis Delivery Systems

Guidelines

- 4A. Double-bag systems should be preferred, because they are more efficient in preventing peritonitis in CAPD patients.**
(Evidence level A)
- 4B. If double-bag systems are not available, any alternative Y-set system should be preferred to any spike system, again because of more efficient prevention of peritonitis**
(Evidence level A)
- 4C. Although disinfecting devices have not demonstrated any significant reduction of peritonitis rates obtained by double-bag or Y-set systems, they are recommended for patients who have to use a spike system**
(Evidence level A-B)

5. Peritoneal dialysis solutions

Guidelines

- 5A. Although the low glucose degradation products (GDP's) containing solutions, buffered with either lactate, bicarbonate, or both, have not yet proven to have long-term clinical benefits, their use as first choice should be considered (Evidence level C) because of their better biocompatibility over the conventional glucose/lactate based solutions (Evidence level A). However, there may be economic/resources implications.**
(Evidence level C)

Commentaar 5A:

Het gebruik van low GDP-oplossingen wordt hier aanbevolen, let wel dit betreft een opinion based richtlijn, level C !

- 5B.** 7.5% icodextrin containing solution could be used in patients with fluid overload related to insufficient peritoneal ultrafiltration in the long dwell (CAPD and APD) and to avoid excessive glucose exposure. This is especially recommended for patients with a transient or permanent highly permeable peritoneal membrane. Icodextrin should only be administered once daily to avoid excessive plasma maltose and high molecular weight polymer concentrations.
(Evidence level A)
- 5C.** The use of an amino acid containing solution should be considered in malnourished patients as a part of a strategy aimed to improve nutritional status. Amino acid solutions should only be administered once daily (4-6 hour dwell) to avoid uraemic symptoms and metabolic acidosis
(Evidence level B)
- 5D.** Low calcium containing solution should be used in patients with hypercalcemia. However serum calcium concentration should be monitored in order to avoid hypocalcemia.
(Evidence level A)
- 5E.** Low magnesium containing solution should be used in patients with hypoparathyroidism
(Evidence level B)
- 5F.** High buffer containing solution should be used in patients with metabolic acidosis (venous serum bicarbonate < 25 mmol/l). However serum bicarbonate concentration should be monitored in order to avoid metabolic alkalosis (venous serum bicarbonate > 29 mmol/l).
(Evidence level A)

Commentaar:

5E: Vanwege de omgekeerde relatie tussen serum magnesiumspiegel en PTH, onafhankelijk van andere factoren die van invloed zijn op het PTH-gehalte. Eerst oorzaken van hypoparathyreoidie uitsluiten of behandelen, zoals gebruik vit D en calciumpreparaten en status na bijschildklieroperatie, daarna is deze aanbeveling te overwegen.

6. Automated peritoneal dialysis

Guidelines

- 6A.** Indications for APD are:
(1) inability to obtain adequate ultrafiltration and solute clearances in CAPD,
(2) the necessity to avoid a high intraperitoneal pressure,
(3) patient's preference.
(Evidence level B)
- 6B.** APD should be applied in combination with a long dwell exchange to achieve adequate solute clearances, especially in the absence of residual renal function.
(Evidence level B)
- 6C.** Tidal PD is indicated in patients with inflow/outflow pain. Another indication for tidal PD is slow peritoneal drainage, to increase the efficiency by reducing outflow alarms on the cyclor.
(Evidence level B)

- 6D. Standardised peritoneal function tests such as the peritoneal equilibration test should be used in computer simulation programs to establish the optimal dialysis prescription. The regime has to be checked by 24-hour dialysate collections (see also the section on adequacy/prescription)**
(Evidence level C)

Commentaar:

Bij APD moeten de cycli niet te kort zijn i.v.m. Natrium-sieving en daardoor verminderde Na-clearance, hetgeen kan leiden tot hypertensie. Cave het gebruik van automatische predictiemodellen die hier geen rekening mee houden.

Een te groot tidal volume leidt bijna nooit tot een effectievere dialyse, dus alleen een klein tidal volume gebruiken om de pijnklachten te verminderen bij een volledig lege buik na de uitloop.

7. Adequacy of peritoneal dialysis

Guidelines

- 7A. Adequacy targets for dialysis should include both urea removal and fluid removal.**
(Evidence level C)
- 7B. These targets should be based on those achieved by peritoneal dialysis only. Urine production and renal urea clearance can be subtracted from the targets.**
(Evidence level C)
- 7C. The minimum peritoneal target for Kt/V_{urea} is a weekly value of 1.7 (evidence level A), the minimum peritoneal target for net ultrafiltration in anuric patients is 1.0 litre/day.**
(Evidence level C)
- 7D. When the targets are not achieved, patients should be monitored carefully for signs of overhydration, uremic complaints and malnutrition. Appropriate therapy changes might be considered.**
(Evidence level C)
- 7E. Some APD patients who use frequent short exchanges and have a slow transport status, can fulfil the above targets, but may have a low peritoneal creatinine clearance. In these patients an additional target of 45 L/week/1.73 m² for peritoneal creatinine clearance should be aimed at in addition to achieving the Kt/V urea target of 1.7.**
(Evidence level C)

Commentaar:

Het gebruik van hoogglucoseoplossingen dient zo veel mogelijk te worden vermeden, door het gebruik van een Na-beperkt dieet in combinatie met een vochtbeperking. Verder dient alles in het werk te worden gesteld om de restnierfunctie zoveel mogelijk te behouden.

8. Nutrition in peritoneal dialysis

Guidelines

- 8A. All patients should receive nutritional counseling based on an individualized plan of care.**
(Evidence level C)
- 8B. Nutritional status should be assessed every 6 months using a panel of measures.**
(Evidence level C)

Serum albumin alone is not a clinically useful measure for protein/energy nutritional status in peritoneal dialysis patients.

(Evidence level B)

We recommend that subjective global assessment (SGA), protein intake (as assessed from the Protein equivalent of total nitrogen appearance, nPNA, or by dietary recall) and an assessment of protein nutrition should be used.

(Evidence level C)

- 8C. The target for dietary protein intake is generally regarded to be ≥ 1.2 g/kg/day; it should not be below 0.8g/kg/day in any patient. On average, the achieved nPNA needs to be ≥ 1 g/kg/day, adjusted for patient's age and physical activity.**
(Evidence level C)
- 8D. In non-obese patients (BMI < 27 kg/m²) dietary energy intake should be 35 kCal/kg/day, adjusted for age and taking the energy derived from peritoneal glucose absorption into account. In malnourished patients the energy and protein intake should be normalized to desirable body weight.**
(Evidence level C)
- 8E. Metabolic acidosis (venous bicarbonate < 25 mmol/l) should be avoided.**
(Evidence level A)
- 8F. When malnutrition develops in a PD patient, the adequacy of the dialysis prescription should be assessed, underdialysis should be excluded and other causes like inflammation should be investigated.**
(Evidence level C)

Commentaar:

*Nutrition in Peritoneal Dialysis is ook onderdeel van de NfN Richtlijn Voeding 2008.
<http://www.nefro.nl/home/richtlijnen>*

8F: Functionele testen van het peritoneum dienen te worden overwogen. Indien er tevens aanwijzingen bestaan voor ultrafiltratiefalen, dient aanvullend onderzoek plaats te vinden, zie aparte richtlijn Monitoring adequaatheid en membraanfunctie bij peritoneale dialyse.

9. PD and Transplantation

Guidelines

- 9A. Peritoneal dialysis is a good treatment prior to renal transplantation. Therefore it should not be considered a contraindication for transplantation.**
(Evidence level B)
- 9B. Peritoneal dialysis can be used during delayed graft function after transplantation.**
(Evidence level B)
- 9C. The catheter can be left in situ 3-4 months despite a functioning graft; nevertheless earlier removal after successful transplantation is advisable.**
(Evidence level B)
- 9D. Peritonitis and exit-site infections in transplanted patients should be treated using the ISPD guidelines; the threshold for catheter removal should be low.**
(Evidence level B)

Commentaar:

9D: Zie tevens advies 3 J.