

Peritoneal dialysis glossary 2009

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Abstract A number of attempts to create a commonly accepted terminology regarding definitions and terms used for clinical entities, methods, problems, and materials encountered by health professionals involved in peritoneal dialysis (PD) were undertaken in the past, the last one in 1990. Later on, some relevant sporadic attempts in a number of textbooks have been made, but they did not include the whole spectrum of PD. This glossary is an attempt to address the need for a universally accepted PD terminology including the latest advances in PD connection systems and fluids.

Keywords Glossary · Peritoneal dialysis · Terminology

Back in 1984, the lack of a complete agreement regarding definitions and terms used for clinical

entities, methods, problems, and materials encountered by health professionals involved in peritoneal dialysis (PD) was first acknowledged [1]. In the following years, a number of attempts to create a commonly accepted terminology has been made, the last one in 1990 [2–5]. Sporadic attempts have also been made in relevant chapters in a number of textbooks and a few journal articles [6–15]. However, they did not include the whole PD spectrum and many terms still remain controversial. Furthermore, although the basic idea of PD has not changed substantially in recent years, there has been a number of advances in PD fluids and connection systems that have made the need for a universal PD glossary even greater. This manuscript is an attempt to address this need for a common language, which we hope will result in less confusion and better understanding and cooperation between all people aiming to the progress of PD. The terms used in this glossary have been obtained from all previous relevant publications as well as by the guidelines published by the International Society for Peritoneal Dialysis (ISPD) [16, 17]. All terms are presented in alphabetical order.

Assisted PD	The administration of PD modality to a physically dependent patient by a home-visiting nurse, a caregiver or a family member
Automated PD (APD)	A number of different PD modalities that use an automated PD machine

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Automated PD machine	An electrical appliance specifically designed to perform peritoneal dialysis automatically, also known as a “cyclor”	Continuous flow peritoneal dialysis (CFPD)	A PD modality where dialysate flows continuously in and out the peritoneal cavity through two separate catheters or one dual lumen catheter
Biocompatible PD solutions	PD solutions with characteristics like low GDPs concentration, near neutral pH, low concentration of lactate buffer (some biocompatible solutions use bicarbonate as a buffer and others use a mixture of bicarbonate and low lactate concentrate)	Culture negative peritonitis	The appearance of cloudy effluent (with more than 50% polymorphonuclear white blood cells) and abdominal pain with persistently (>3) negative cultures of peritoneal effluent
Catheter extension	A piece of tubing connecting the catheter to the PD delivery system	Cyclor Dialysate Dialysate container	See automated PD machine The PD solution The bag containing the dialysate, also known as “peritoneal dialysis bag”
Catheter-related peritonitis (or exit site– or tunnel infection–related peritonitis)	A peritonitis episode in conjunction with an exit-site or tunnel infection with the same organism as that at the exit site	Dialysate fresh Dialysate spent	The unused dialysate The dialysate drained out after its dwell in the peritoneal cavity, also known as effluent
Connecting device	A device of different designs (exclusively specific for each PD delivery system) used for the connection of the catheter or its extension to the delivery system. Synonym to connector	Disconnecting system	Also known as disconnect system, refers to those CAPD delivery systems, which are disconnected from the patient between bag exchanges
Connector	See connecting device	Disinfectant	Any solution used for the disinfection of any connection site of a PD delivery system, or at the exit site
Continuous ambulatory peritoneal dialysis (CAPD)	A PD modality where a certain amount of dialysate is always present in the peritoneal cavity resulting in a continuous dialysis method. Four daily exchanges are typically performed manually using gravity or in some cases with the use of an assisting device	Disinfecting device	A device of different designs using various sources of energy (heat, UV light) in order to disinfect the connection site of a PD delivery system
Continuous cycling peritoneal dialysis (CCPD)	An APD modality with a number of exchanges during the night and a long daytime dwell. All exchanges are performed by a cyclor	Diurnal PD or daytime PD	A number of manual exchanges during the day with a dry abdomen during the night (for those who need short exchanges and for whatever reason cannot or will not use a cyclor)
Continuous cycling peritoneal dialysis plus or enhanced (CCPD plus or enhanced CCPD)	CCPD with the addition of at least one daytime manual exchange	Double-bag system	A CAPD delivery system where both bags (the one containing the fresh dialysate and the empty drainage bag) are already connected to a Y-shaped tubing by the manufacturer

Drain	The action of outflow of the spent dialysate from the peritoneal cavity	Exit-site infection	Evidence of inflammation (pain, swelling, erythema, and/or discharge) at the exit site
Drainage bag	The bag where the spent dialysate is drained into	Fill	The action of inflow of the fresh dialysate from its container into the peritoneal cavity
Drainage time	The time needed for the peritoneal fluid to drain from the peritoneal cavity into the drainage bag	Flush before fill	The action of flushing the tubing with a small volume (~100 ml) of fresh dialysate drained from the new bag directly into the drainage bag, followed by the drainage of the spent dialysate and then the filling of the peritoneal cavity with fresh dialysate
Dry or target weight	The weight of the patient at which all or most excess body fluid has been removed, and the patient does not suffer from hypotension or symptoms like cramps, malaise, or dizziness	Glucose degradation products (GDPs)	Products resulting from the degradation of glucose during heat sterilization of the dialysate, which are believed to be toxic to the peritoneal membrane. Glucose can bind in a non-enzymatic way to amino residues forming a Schiff base and later a reversible Amadori glycosylation product. These products undergo rearrangements over time and form the irreversible advanced glycation end products (AGEs), which may play a role in the development of peritoneal fibrosis and microvascular sclerosis, observed in long-term PD patients
Dwell	The period during which the dialysate remains inside the peritoneal cavity (usually from the end of infusion to the beginning of drainage)	Gross peritoneal surface area	The anatomical surface area of the peritoneal membrane lining the peritoneal cavity
Effective peritoneal surface area	The area of the peritoneal surface that is sufficiently close to peritoneal capillaries to play a role in solute and water transport	Icodextrin	Usually a 20 glucose polymer molecule which is used as an agent inducing ultrafiltration by oncotic pressure. [From the Greek word for twenty: eicosi or ico(si) + dextrin = icodextrin.]
Encapsulating peritoneal sclerosis (former term: Sclerosing encapsulating peritonitis)	A life-threatening complication of long-term PD where an encapsulating sclerotic reaction of the peritoneum develops, with the bowel enveloped in a thick cocoon of fibrous tissue, causing continuous or intermittent, partial or complete bowel obstruction	Inflow time	The time needed for the fresh dialysate to enter the peritoneal cavity
Enteric peritonitis	Infectious peritonitis with organisms consistent with those from the GI tract. (Presence of anaerobic organisms is pathognomic of this condition.)	Intermittent peritoneal dialysis	Includes PD regimens where treatment is performed intermittently several times per week
Exit site	The most external part of the sinus tract and the skin surrounding the exit of the catheter tunnel. Usually the location of the exit site is in the abdominal wall, but a presternal exit site is also an option		

Kt/V	A numerical dimensionless index measuring urea clearance, expressed per volume of distribution of urea. Originally conceived for hemodialysis, it can be used in assessing PD adequacy. In patients with residual renal function, it has a peritoneal component (the clearance achieved by PD) and a renal component (the clearance attributed to residual renal function). Because of almost complete equilibration between blood and dialysate at 5–6 h $Kt = \text{dialysate volume}$. Minimum Kt/V target for adequate dialysis = 1.7/week	Nocturnal intermittent peritoneal dialysis (NIPD)	An automated PD modality with a number of exchanges performed by a cyclor during the night and a “dry” abdomen during the day
		Non-disconnecting system	Also known as non-disconnect system, it refers to those CAPD-delivery systems, where the dialysate bag remains connected to the patient between bag exchanges
		O-set	A variant of the original Y-set, named from the shape it takes when the two free limbs are connected to each other during the dwell phase
Luer lock	A type of tubing connector with threaded fittings for a secure connection and added leverage for a seal disconnect. The concept for these connectors and adapters was developed by Hermann Wülfing Luer, a German medical instrument maker whose name still defines this unique design.	Peritoneal catheter cuff	A band of fabric (e.g. dacron) affixed to the intratunnel part of the catheter leading to pericatheter fibrous tissue growth. Usually, peritoneal catheters have two cuffs, one located close to the endoabdominal fascia (deep or epiperitoneal or inner or internal cuff) and the other located close to the skin (outer or subcutaneous or superficial or external cuff)
Mass transfer area coefficient (MTAC)	For a given solute, MTAC is equivalent to the diffusive clearance of that solute per time unit in a theoretical situation where dialysate flow is infinitely high, so that the solute gradient is always maximal (MTAC is analogous to K_0A of a hemodialysis membrane and is best assessed at the beginning of each exchange when there is maximum difference in the concentration between blood and dialysate)	Peritoneal catheter tunnel	The passageway through the abdominal wall within which the peritoneal catheter is contained
		Peritoneal clearance	The volume of plasma from which a solute is removed by PD per unit of time
		Peritoneal dialysate leak	Extravasation of the fluid to any space outside the peritoneal cavity (e.g. pleural cavity, through the exit site or the surgical incision, scrotum)
Membrane failure	The inability of the peritoneal membrane to maintain adequate ultrafiltration or adequate solute clearance	Peritoneal dialysis bag	See dialysate container
		Peritoneal dialysis catheter	Refers to the permanent peritoneal catheter. The intraperitoneal and extraperitoneal portions differ in various catheters. The most commonly used type of catheter
Net sieving coefficient	The fraction of extracellular solute volume removed per unit of ultrafiltrate volume		

	is the Tenckhoff catheter (straight, coiled, or swan-neck design). Modifications of the Tenckhoff catheter are the Missouri swan-neck catheter, the Moncrief–Popovich swan-neck catheter and the Toronto Western Hospital (TWH) or Oreopoulos–Zellerman catheter. During implantation in the abdomen, the external part of a permanent PD catheter may be embedded under the skin for a certain period of time. The external part of the catheter is revealed just before the initiation of PD.		
Peritoneal dialysis connectology	A conventional term referring to the various systems of transfer sets, connecting devices, containers, adapters etc., which are used during the process of PD	Peritoneal dialysis solution	The fresh dialysis solution
Peritoneal dialysis delivery system	A system incorporating all necessary parts and actions required for the process of bag exchange in PD. Synonym to “peritoneal dialysis system”	Peritoneal dialysis system	Synonym to “peritoneal dialysis delivery system”
Peritoneal dialysis-associated peritonitis	Infection of the peritoneum in a PD-treated patient presenting with at least two of the following: abdominal pain, cloudy effluent and >100 WBC/ μ l (with $>50\%$ polymorphonuclear cells) in the effluent dialysate	Peritoneal dialysis training	The procedure of preparing a patient for the self administration of the PD treatment, including preparation of materials, aseptic technique, prevention of contamination, exit-site care; performing exchanges, troubleshooting, record keeping, ordering supplies. PD training is usually provided by a specially trained nurse
Peritoneal dialysis dose	The amount of dialysate used in a specified time. It can be numerically expressed by Kt/V or creatinine clearance and should be corrected to either the total body water or body surface area	Peritoneal eosinophilia (former term: Eosinophilic peritonitis)	Asymptomatic cloudy effluent with more than 15% eosinophils in a differential WBC count. It usually appears the first few months after starting PD and is a benign self-limiting condition (Peritoneal eosinophilia can also occur later during some fungal infection)
Peritoneal dialysis modality or method or regimen	A means or manner in which the PD procedure is attained	Peritoneal equilibration test (PET)	A standardized procedure for the determination of each patient’s peritoneal permeability and ultrafiltration capacity. It involves a 4-h PD dwell using a 2.5% (or a 4.25%) glucose solution and certain measurements of creatinine, glucose, and urea in plasma and dialysate, at times 0 (end of infusion), 2 h, and 4 h
Peritoneal dialysis prescription	The combination of PD modality, dose, and schedule	Peritoneal sclerosis	The extensive thickening of the peritoneal membrane due to fibrous tissue and new vessel formation, usually as a result of long-term PD, especially when the latter is complicated by severe or recurrent peritonitis
Peritoneal dialysis regimen	A systematic plan of PD therapy, intermittent or continuous	Peritoneal transport (permeability) rate	The rate of small molecule transport across the peritoneal membrane during PD. Patients are divided into four categories, according to the dialysate/plasma creatinine ratio at 4 h during a standard PET (high,

	high average, low average and low transporters)		
Peritonitis (and/or exit-site infection) rate	Peritonitis (and/or exit-site infection) rates can be expressed as the number of episodes divided by time unit at risk (episodes/PD years) or alternatively as months of PD at risk divided by the total number of episodes (interval in months between episodes)	Titanium (or plastic) adaptor	volume), leaving a certain amount of dialysate in constant contact with the membrane (reserve volume) The Luer lock adaptor, made of titanium (or plastic), connecting the catheter to its extension or to the administration set of a double-bag system
PVC	Polyvinyl chloride	Transfer set	The tubing connecting the catheter to the dialysate bag in the non-disconnecting system
Recurrent peritonitis	A peritonitis episode that occurs within 4 weeks of completion of therapy of a prior episode but with a different organism	T-set	A variant of the double-bag system, which consists of a catheter extension equipped with a very short lateral limb, through which, at the end of the exchange, before the disconnection of the bag, a disinfectant is injected filling the catheter extension
Relapsing peritonitis	A peritonitis episode that occurs within 4 weeks of completion of therapy of a prior episode of peritonitis with the same organism or a prior sterile episode	Tunnel infection	Erythema, edema or tenderness or any combination of these over the subcutaneous portion of the catheter
Repeat peritonitis	A peritonitis episode that occurs more than 4 weeks after completion of therapy of a prior episode with the same or different organism	Twin-bag system	Synonym to “double-bag” system
Refractory peritonitis	Failure of the effluent to clear after 5 days of appropriate antibiotic therapy	Ultrafiltration	The process by which water is transferred from the patient’s vasculature into the peritoneal cavity
Spike	A rigid pointed hollow plastic part at the end of the connection tube	Ultrafiltrate	The net amount of fluid resulting when the original volume of the dialysate used for a certain dwell is subtracted from the volume of the drained dialysate (effluent – infused dialysate = ultrafiltrate)
Standard PD system	The non-disconnecting or wearable PD system	Ultrafiltration (net)	Net ultrafiltration = osmotic filtration – fluid absorption during dwell (fluid flow from the cavity to lymphatics and subperitoneal tissue) divided by the duration of the dialysis dwell
Sterile peritonitis	Synonym to culture-negative peritonitis	Ultrafiltration failure	The inability of the peritoneal membrane to provide adequate ultrafiltration
Technique failure rate	The proportion of PD patients switching to hemodialysis	Weekly creatinine clearance	An index of dialysis adequacy measured in liters/week. Like Kt/V, it may have a peritoneal and a renal component. For com-
Three-pore model	A theoretical model describing solute and water transport across the peritoneal membrane proposing the presence of three different sizes of pores. The smallest are considered to be the aquaporins		
Tidal peritoneal dialysis	An APD modality where, after an initial fill of the peritoneal cavity only a portion of the dialysate is drained and replaced by fresh dialysate in each cycle (tidal		

parison purposes, it is corrected to 1.73 m^2 of body surface area (BSA). The target is $50\text{--}55 \text{ L/week}/1.73 \text{ m}^2 \text{ BSA}$

Y-set

A Y-shaped connecting tube. During the bag exchange procedure the main (vertical) limb of the Y-shaped connecting tube is connected to the catheter extension, while the second limb is connected to an empty (drainage) bag and the third one to a new bag containing fresh dialysate

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