

Patient Waiting: Glossary (variables, metrics and measurement methods)

	Term	Definition	Metrics	Measurement method
Environmental variable	Amenities	Features of health services that do not relate directly to clinical effectiveness but may enhance the client's satisfaction and willingness to return (Brown, Franco, Rafeh, & Hatzell, 1998)	Type of amenities (Cusack et al., 2010)	Environmental inspection/audit - Seven amenities presented in the waiting room (comfy chair, magazine and puzzle book, plasma TV, paintings on walls, views from windows, computer, potted plants) reacted to by patients on questionnaires (Cusack et al., 2010)
	Attractiveness, physical environment	Aesthetic appeal of the physical environment, including the surrounding external environment, the architectural design, facility upkeep and cleanliness, and other physical elements (Becker & Douglass, 2008)	- Physical environment attractiveness score (summation of ranks) (Becker & Douglass, 2008) - Attractiveness rating on 5-point scale (Pruyn & Smidts, 1998)	Subjective rating - Four photos of each of six facilities were presented to six university graduate students in non-design majors. The students were asked to rank the environments from most attractive (6) to least attractive (1). The ratings from all students regarding one facility were summed to create an environmental attractiveness score with a higher score reflecting a more attractive environment (Becker & Douglass, 2008). - Perceived attractiveness, measured on four attributes: atmosphere, cleanliness, spaciousness and climate on a 5-point scale by patients (Pruyn & Smidts, 1998)
	Emergency Department, layout	Spatial configuration of the ED, including treatment rooms, work stations, and other components (Hall et al., 2008)	- Distance from treatment room to work station - Solid door versus soft curtain (Hall et al., 2008)	Environmental inspection/audit - Treatment rooms were classified based on two factors: 1) the distance from treatment room to work station (distance >25 ft, <25 ft); 2) type of separation (solid door vs. soft curtain) (Hall et al., 2008)
	Information access	Patient access to information regarding ED process (time to see a doctor/consultant, blood draw) and medical and therapeutic plans (Tran et al., 2002).	- Yes versus no (Tran et al., 2002) - Before versus after (Papa et al., 2008)	Experimental manipulation - In the intervention group, ED process information and medical information were provided to each patient every 15 minutes. The control group received regular care (Tran et al., 2002) - An instructional waiting room video explaining what patients should expect during ED visits played continuously on a TV set in the waiting room (Papa et al., 2008).
	Positive distractions	A set of environmental features or conditions that have been found by research to effectively reduce stress. These features or conditions include nature and certain types of music, companion animals, laughter or comedy, and certain types of art (Ulrich, 1991).	- Yes/no, before/after art intervention (Nanda, 2010) - Visual-auditory stimuli presented on a plasma TV (Pati & Nanda, 2011)	Experimental manipulation - Art intervention included plasma TV screens showing looped video of nature scene photos, still nature photographs printed on canvas, window films with garden scenes and cloud patterns (Nanda, 2010) - Five distraction conditions as defined by types of visual and audio stimuli—slide show of nature images, virtual Ambient Art, natural aquarium, and accompanying audio (Pati & Nanda, 2011)

	Term	Definition	Metrics	Measurement method
	Rapid assessment clinic/pod/zone	An ED area for quick clinician assessment and procedures on patients whose disposal is readily apparent for whom required interventions can be quickly undertaken, and for problems that do not require prolonged assessment or decision-making. Generally adapted from existing ED space, it is a novel intervention for reducing ED waiting time (Ardagh et al., 2002; Bullard et al., 2011).	- RAC versus no RAC (Ardagh et al., 2002, Bullard et al., 2008)	Experimental manipulation - RAC operated in odd weeks and did not operate in even weeks during the study period (Ardagh et al., 2002) - ED spaces were converted to RAP (Bullard et al., 2008)
Outcome	Satisfaction, patient	Degree to which an individual regards a provider's health care service, product, or the manner in which the service or product is delivered as useful, effective, or beneficial (NLM MeSH).	- Overall satisfaction with service (Papa et al., 2008; Pruyn & Smidts, 1998)	Questionnaire - One question in the survey asked for the overall satisfaction level, 5-point Likert scale, excellent - poor (Papa et al., 2008) - Overall patient satisfaction rated on a 10-point scale (Pruyn & Smidts, 1998)
	Waiting behavior, patient	Behaviors that patients exhibit in waiting rooms (Nanda, 2010; Pati & Nanda, 2011).	- Percentage of behaviors in the following categories: attention (positive distraction, other artwork, toy, book, wall, ceiling, floor, door, window, furniture, people, themselves), physical behavior (calm, fidgety, fine movement, intense), activity (playing with toys, playing with non-toys, non-play activity/other play), location (out of seat, in seat, parent's lap), social behavior (positive interaction, negative interaction, solitary behavior) (Pati & Nanda, 2011) - Number of discrete behaviors (getting out of seat, entering waiting room, people pacing, changing seat, aggressive behavior) in three, 5-minute periods every 20 minutes (Nanda, 2010)	Observation - Behavioral observations during 20-minute windows over 12 days, snapshot at beginning of each minute, modification of an existing children's observation instrument (Handen, McAuliffe, Janosky, Feldman, & Breaux, 1998) (Pati & Nanda, 2011) - Systematic observation, behavior mapping (Nanda, 2010)

	Term	Definition	Metrics	Measurement method
	Waiting time, patient	Period of time from when a patient arrives at a clinic or ED to the time his or her consultation/treatment begins (Dexter, 1999).	<p>Actual waiting time</p> <ul style="list-style-type: none"> - EED: patient waiting time to be seen by a doctor (minute) (Ardagh et al., 2002), overall ED length of stay (minute) (Ardagh et al., 2002; Bullard et al., 2008), time from triage to bed (Bullard et al., 2008), ED time from bed to physician (Bullard et al., 2008), time from treatment room to physician (Hall et al., 2008) - Medical office: time spent in waiting room and exam room (Becker & Douglass, 2008) <p>Perceived waiting time</p> <ul style="list-style-type: none"> - Percentage of respondents who estimated waiting time in several categories, from '0-5 minutes' to 'more than 30 minutes' (Becker & Douglass, 2008) - Subjective rating from "very short" to "very long" (Papa et al., 2008) 	<p>Medical records</p> <ul style="list-style-type: none"> - Data extracted from the ED module of Patient Management System (Ardagh et al., 2002) - Actual waiting time and LOS were extracted from computerized medical records (Tran et al., 2002) - Times were recorded by physicians and retrospectively collected from existing database (Hall et al., 2008) <p>Observation</p> <ul style="list-style-type: none"> - Observer was located in waiting area and hallway outside exam rooms. Time from patient entering the practice until called into exam room by staff and time from patient entering exam room until leaving the exam room (Becker & Douglass, 2008) <p>Questionnaire</p> <ul style="list-style-type: none"> - Patient perception of how long they waited in the waiting area and in the exam room was assessed on the survey (Becker & Douglass, 2008) - In one question, questionnaire asked patients to rate the wait time on a 4-point scale from 'very short' to 'very long' (Papa et al., 2008)

Patient Waiting: Article Analysis


Reference	Environmental feature		Outcome		Study design	Results	Setting	Sample
	Variable	Metric	Variable	Metric				
Ardagh, M. W., Wells, J. E., Cooper, K., Lyons, R., Patterson, R., & O'Donovan, P. (2002). Effect of a rapid assessment clinic on the waiting time to be seen by a doctor and the time spent in the department, for patients presenting to an urban emergency department: A controlled prospective trial. <i>New Zealand Medical Journal</i> , 115 (1157), U28.	Rapid assessment clinic (RAC)	RAC vs. no RAC (RAC was in operation in odd weeks and no RAC in even weeks during the study period)	Patient waiting time to be seen by a doctor Length of time in ED	Data extracted from the ED module of Patient Management System, minute	Quasi experimental	The waiting time to be seen by a doctor was 8-11 minutes shorter, and the length of stay in ED was 20-25 minutes shorter for patients in Triage 4 and 5 categories in RAC weeks than in no RAC weeks. No difference was found in patients in Triage 2 and 3 categories	An ED in Australia	4471 patients who attended the ED during the 10 week period
Becker, F., & Douglass, S. (2008). The ecology of the patient visit: Physical attractiveness, waiting times, and perceived quality of care. <i>Journal of Ambulatory Care Management</i> , 31(2), 128-141.	Physical environment attractiveness	Physical environment attractiveness score (summation of ranks based on subjective ratings by university students)	Patient perceived waiting time. Actual waiting time Perceived quality of care	Questionnaire - Perceived waiting time (percentage of respondents in categories from '0-5 minutes' to 'more than 30 minutes') Observation - Time from patient entering the practice until being called into exam room by staff and time from patient entering exam room until leaving the exam room, minute - Quality-of-care index: % of "excellent" responses to a question (patient questionnaire survey, 4 questions: The care I received here today was...; The service I received here today was...; Overall, my interactions with staff were...; Overall, my interactions with doctors were...);	Correlational study; cross sectional	Higher ratings of environmental attractiveness were associated with more favorable perceptions of the quality of care, a higher percentage of anxiety reduction, higher ratings of staff interactions. Significant relationships were found between patient perceptions of time and perceived overall quality and anxiety reduction. There is no direct relationship between environmental attractiveness and perceived waiting time. Patients tended to overestimate short waiting time and underestimate long waiting time.	Six outpatient facilities in New York	Six graduate students, 205 outpatients
Bullard, M, Lo, A, Latoszek, K., Holroyd, B., Rowe, B. (2008). Impact of a rapid-assessment pod on ED overcrowding measures: A randomized trial. <i>Academic Emergency Medicine</i> , 15 (5 Suppl 1), S197.	Rapid assessment pod (RAP)	Three ED standard care spaces were converted to 2 stretchers for clinician assessment and procedures and 7 chairs for patients to be transferred to receive medications, IV therapy, be observed, or wait for results	- ED length of stay - Time from triage to bed - Time from bed to physician	Medical records, minute	Experimental	Time from triage to bed was reduced significantly by 24 minutes for CTAS level 3 patients. The ED length of stay was reduced from 567 to 544 minutes although the difference was not statistically significant.	An ED in Canada	More than 6000 ED visits
Cusack, P., Lankston, L., & Isles, C. (2010). Impact of visual art in patient waiting rooms: Survey of patients attending a transplant clinic in Dumfries. <i>Journal of the Royal Society of Medicine Short Reports</i> , 1(6), 52.	Amenities for patients in clinic waiting room	Seven patient amenities: comfy chair, magazine, puzzle book, plasma TV, paintings on the walls, views from windows, computer, potted plants.	Patient preference	Questionnaire - Ratings of the importance of the seven amenities presented in the waiting area, 5-point scale, 1 not at all important, to 5 very important - Ratings of art type: landscape/nature, portraits, animals/bird paintings, abstract art.	One-shot study	The most important amenity was the comfy chairs, followed by magazines and puzzle books, plasma TV, and paintings on the walls. Views from windows, computer and potted plants were least rated. Patients preferred paintings with the contents of landscapes/nature and animals/birds.	A renal transplant unit in a UK hospital	44 patients
Hall, K. K., Kyriacou, D. N., Handler, J. A., & Adams, J. G. (2008). Impact of emergency department built environment on timeliness of physician assessment of patients with chest pain. <i>Environment and Behavior</i> , 40(2), 233-248.	ED layout	Distance from work station to treatment room (>25 ft, <25 ft) Solid door vs. soft curtain (yes/no)	Patient waiting time in treatment room	Time in minutes from placement of patient in ED treatment room to the initial physician assessment (10 min or less, >10 min), collected from existing database, recorded by physician	Correlational study	The presence of a solid door and longer distance (>25ft) from patient treatment room to work station were significant predictors of patient longer waiting time in treatment room.	ED in a large urban teaching hospital	2024 ED visits

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Nanda, U. (2010). <i>Improving the waiting experience in the emergency department: A two phase study</i>. Concord, CA: Center for Health Design.	Art intervention	The installation of: - plasma screens showing looped video of nature scene photos - still nature photographs printed on canvases - window films with garden scene and cloud pattern	Patient behavior in waiting rooms Noise level	Systematic observation, behavior mapping - continuous behaviors (reading, dosing, watching TV) annotated on floor plans with symbols for one 5-minute period every 20 minutes - discrete behaviors (getting out seat, entering waiting room, people pacing, changing seat, aggressive behavior), the number of behaviors in three 5-minute periods every 20 minutes. - behaviors were classified into three categories: distraction, non-distraction activity, restless/anxious behavior Noise measurement four times per hour, UEI DSM101 sound level meter	Before-after study	Significant decreases in restless behavior and "people watching" were found in both sites after the installation of art intervention. Noise levels and the number of front desk queries decreased; people talking increased.	ED waiting rooms at two large hospitals in Houston	60 hours of observational data (30 before and 30 after art intervention) in each waiting room
Papa, L., Seaberg, D. C., Rees, E., Ferguson, K., Stair, R., Goldfeder, B., & Meurer, D. (2008). <i>Does a waiting room video about what to expect during an emergency department visit improve patient satisfaction? Canadian Journal of Emergency Medicine, 10(4), 347-354.</i>	Patient access to information	A instructional waiting room video explaining what patients should expect during ED visits. The video was played on a TV set in the waiting room continuously.	Perceived waiting time Patient satisfaction	Questionnaire completed before discharge - Perceived waiting room time, 4-point, very short - very long - Overall satisfaction with ED visit, 5-point Likert scale, excellent - poor	Before-after study	Patients in the post-video group were significantly more satisfied with the ED visit. About 65% patients in this group rated the ED visits as excellent or good, compared to about 58% in the pre-video group. Patients in post-video group perceived a slightly shorter waiting time but the difference was not statistically significant.	ED in a tertiary care university teaching hospital	1132 patients (551 pre- and 581 post-video)
Pati, D. & Nanda, U. (2011). <i>Influence of positive distractions on children in two clinic waiting areas. Health Environments Research and Design Journal, 4(3), 124-140.</i>	Positive distractions	Visual-auditory stimuli presented on a plasma TV: - no stimuli, the control condition; - visual-static stimuli: still nature photographs in a slide show (no audio); - visual-dynamic stimuli: virtual Ambient Art (with accompanying audio); - visual-dynamic stimuli: virtual Ambient Art (without accompanying audio); - visual-dynamic stimuli: natural aquarium (with accompanying underwater sounds); - visual-dynamic stimuli: natural aquarium (without accompanying underwater sounds).	Children's activities and behaviors	Behavioral observations during 20-minute windows over 12 days, snapshot at beginning of each minute, modification of an existing children's observation instrument (Handen, McAuliffe, Janosky, Feldman, & Breau, 1998), percentage in the following categories - Attention: positive distraction, other artwork, toy, book, wall, ceiling, floor, door, window, furniture, people, themselves - Physical behavior: calm, fidgety, fine movement, intense - Activity: playing with toys, playing with no toys, nonplus activity/other play - Location: out of seat, in seat, parent's lap - Social behavior: positive interaction, negative interaction, solitary behavior	Quasi experimental	The positive distractions were significant attention grabbers. When positive distractions were turned on, patient's attention to the plasma TV greatly increased. During distraction conditions, children's calm behavior increased by 7-9%.	Patient waiting areas in dental and cardiac clinics in a major pediatric tertiary hospital	158 pediatric patients

Reference	Environmental feature		Outcome		Study design	Results	Setting	Sample
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Pruyn, A., & Smidts, A. (1998). Effects of waiting on the satisfaction with the service: Beyond objective time measures. <i>International Journal of Research in Marketing</i> , 15(4), 321-334.	Physical environment attractiveness	Perceived attractiveness, measured on four attributes: atmosphere, cleanliness, spaciousness and climate	Actual waiting time Perceived waiting time Affect (irritation, fairness, annoyance, boredom, stress) Satisfaction with the service	Questionnaire - Appointment time recorded by patient (from appoint time to time called into physician's room) - Questions asking waiting time and time spent in waiting room, appraisal of waiting time (minute, 1 very short to 5 very long) - Questions regarding affection ratings, 5 point scale - Question about satisfaction with service, 10-point scale	Correlational study	The attractiveness of waiting rooms was positively correlated with the overall satisfaction with service and the positive affects but was not correlated with perceptions of waiting time as short or long. Actual waiting time influences satisfaction mainly through a cognitive route--perceived waiting time.	Polyclinics in three Dutch hospitals	127 men and 210 women
Tran, T. P., Schutte, W. P., Muelleman, R. L., & Wadman, M. C. (2002). Provision of clinically based information improves patients' perceived length of stay and satisfaction with EP. <i>American Journal of Emergency Medicine</i> , 20(6), 506-509.	Patient access to information	In the intervention group, a medical student provided information to each patient every 15 minutes: ED process information (waiting time to see a physician, blood draw, radiologic imaging, time to see a consultant, etc.), medical information regarding diagnostic and therapeutic plans. The control group received standard emergency care.	Patient perceived ED waiting time, ED length of stay Patient rating of staff Actual waiting time, length of stay	Interview, patients were asked to estimate waiting time and LOS, and rate staff Actual waiting time and LOS were extracted from computerized medical records	Experiment	The group of patients who periodically received process and medical information perceived length of stay in ED to be significantly shorter and rated physician significantly more favorable.	A 300-bed academic hospital in US	619 outpatients or proxy informants who visited the ED

Matrix of relationships

		Outcome		
	Variable	Patient waiting time	Patient waiting behavior	Patient satisfaction
Environmental feature	Rapid assessment clinic/pod/zone			
	Physical environment attractiveness			
	Positive distractions			
	Information access			
	Amenities			
	ED layout			

 Note: Cells shaded in gray indicate the existence of evidence supporting relationships between environmental features and outcomes