UNIVERSITAT DE BARCELONA

# Anàlisi de l'activitat clínica, satisfacció de l'usuari i cost/efectivitat d'una Unitat de Diagnòstic Ràpid de Medicina Interna en un hospital terciari

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Tesi Doctoral

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# Índex

# 1. ANTECEDENTS

## 1.1 El cost econòmic de l'hospitalització convencional. L'hospitalització evitable. Les Unitats de Diagnòstic Ràpid (UDR)

### 1.1.1 Introducció/Justificació

És una realitat que l'atenció sanitària pública actual es mou en escenaris canviants i complexes, determinats d'una banda per una demanda creixent amb l' incorporació de noves i costoses tecnologies diagnòstiques que condicionen l'evolució del sector sanitari i exerceixen pressions en el sistema i de l'altre per les inevitables limitacions pressupostàries. Per tot això, les polítiques sanitàries actuals tendeixen cap a la racionalització de l'ús de les tecnologies, en termes de seguretat, eficàcia, efectivitat, eficiència, equitat, benefici social i adequació de costos. D'aquí la necessitat de realitzar una Avaluació Econòmica que donarà suport per obtenir una decisió d'elecció de tecnologia sanitària millor informada.

El llit d'aguts, l'hospitalització convencional, és el recurs més car del nostre Sistema de Salud Públic, és per això que estem obligats a la seva adequada utilització, així com a l'adopció de mecanismes de gestió sanitària que afavoreixin les alternatives assistencials ambulatòries. La necessitat d' aquesta política de gestió sanitària es posa encara més de manifest si tenim en compte que en alguns estudis fets a l'Estat Espanyol s'ha demostrat que fins un 16% dels ingressos hospitalaris es podrien haver evitat potenciant l'assistència ambulatòria(1,2), aquest concepte ha estat nomenat hospitalització evitable(3).

(*) consultar bibliografia

Al llarg dels últims anys els hospitals públics catalans han dissenyat diferents models d'assistència ambulatòria alternatius a l'hospitalització convencional amb l'objectiu de reduir l'hospitalització evitable, els més destacats són: hospitals de dia, unitats d'observació de curta estada, hospitalització domiciliària, programes ambulatoris de medicina i cirurgia major i les unitats de diagnòstic ràpid (UDR) (4,5).

La majoria d'aquests models assistencials, inclouen les UDR depenen dels serveis de Medicina Interna. La visió global e integradora de la medicina interna aporta avantatges sobre l'abordatge estrictament especialitzat.

## 1.2 Les UDR com alternativa i complementarietat a l'hospitalització convencional. Les UDR a Catalunya

La primera UDR a Catalunya i a l'Estat Espanyol es va crear a l'Hospital General de Granollers a l'any 1996 a càrrec de metges especialistes en Medicina Interna (4), seguint el model d'organització descrit per Kendallet al. a Birmighan(6). Posteriorment s'han creat noves UDR al nostre país com la de l'Hospital de Bellvitge a l'any 2005(7)i altres hospitals catalans de nivell terciari (5,8), i finalment s'han desenvolupat en hospitals comarcals estenent-se el model per tot l' Estat (9).

Al llarg d'aquests anys les UDR s'han confirmat com una eina assistencial important en l'atenció ambulatòria a pacients amb sospita de patir una malaltia potencialment greu. Aquestes unitats representen una recent forma assistencial en règim ambulatori, dirigida a l'estudi de pacients en els que no es pot demorar el diagnòstic i, per tant, una decisió clínica de cara a iniciar el tractament. En comparació amb l´ hospitalització convencional els pacients son atesos en un règim d'assistència menys costós, amb la mateixa disponibilitat de mitjans diagnòstics que els pacients ingressats i sense disminuir la qualitat assistencial.

Els objectius de les UDR han estat ben definits (4,5,10) i són: 1) Diagnosticar el més ràpid possible malalties potencialment greus, 2) Evitar l'hospitalització innecessària, 3) Evitar morbiditat hospitalària, 4) Reduir el cost econòmic, 5) Millorar la satisfacció del pacient, 6) Permetre continuar a pacient i familiars la seva vida laboral i social, 7) Reduir la càrrega a urgències i 8) alliberar llits hospitalaris d' aguts en els serveis de Medicina Interna .

## 1.3 La UDR de l'Hospital Universitari de Bellvitge (UDR-HUB). Antecedents. Ubicació i dotació.

La UDR-HUB va néixer a l' octubre de 2005, adscrita al Servei de Medicina Interna. L'HUB forma part de la Gerència Territorial Metropolitana Sud de l´ICS. i és l' hospital de referència comunitari per a 343.172 habitants, disposa de 906 llits dels quals 625 son llits utilitzables i també és centre referent per a processos que necessiten d´ alta tecnologia per a més de 2 milions d´habitants de les Àrees Metropolitana Sud, Camp de Tarragona i Terres de l'Ebre, ja que disposa de totes les especialitats mèdiques i quirúrgiques amb excepció de pediatria i obstetrícia.

La UDR-HUB està dotada amb un metge especialista en Medicina Interna i amb una diplomada d'infermeria, que visiten simultàniament en dos despatxos annexes. Està ubicada a la planta baixa de l'edifici de consultes externes i comparteix instal·lacions i estructura administrativa amb la resta de les consultes externes.

En l'actualitat el metge internista visita dos dies a la setmana amb horari de 8 a 15 hores fent entre 12 i 16 primeres visites i 16 visites successives a la setmana, la consulta d'infermeria de la UDR funciona els 5 dies de la setmana.

Els pacients són enviats des de l'Assistència Primària, l'Àrea d'Urgències i des d'altres serveis de l'HUB. S'han establert criteris de derivació de manera semblant a

altres UDR del nostre entorn sanitari, aquests criteris han estat prèviament consensuats entre els metges potencialment derivadors de pacients(Annex 1).

L'accés a la UDR-HUB es pot fer pel sistema informàtic SAP, telèfon directe, e-mail, i via paper (FAX o valisa),les peticions es revisen a diari pel metge responsable de la unitat.

L'objectiu és que el pacient rebi una primera visita en un termini de 24-48 hores des de que es produeix la sospita de malaltia potencialment greu, després d'aquesta primera visita el pacient té preferència en la realització de les exploracions complementaries, per la qual cosa existeix una bona coordinació amb els diferents gabinets d'exploracions i altres especialistes. Als pacients avaluats en aquesta primera visita se'ls pot realitzar en el mateix dia, si s'escau, les següents exploracions complementàries:

- Analítiques de sang i serologies
- Radiografies simples de tòrax
- Ecografia abdominal i de parts toves
- Punció Aspiració Agulla Fina (PAAF)d'adenopaties o de qualsevol lesió sospitosa accessible

Pel que fa a les adenopaties sospitoses de malignitat es pot fer una PAAF i disposar del resultat anatomopatològic amb una tinció ràpida (diffquick) en 30 minuts. Si el pacient requereix un tractament llarg com paracentesi evacuadora o transfusions, es disposa d'un box d'infermeria amb les instal·lacions necessàries per dur a terme aquestes tasques.

Vuit anys després la UDR s'enfronta a una nova etapa d'innovació amb la possibilitat d'ampliar l'oferta de prestacions, la millorant dels circuits assistencials existents,

creant-ne de nous, seguint innovant amb les TIC potenciant la visita virtual no presencial, buscant aliances amb altres dispositius alternatius a l'hospitalització convencional ( Hospital de dia mèdic, hospitalització a domicili, unitats de curta estada...) i finalment enfocant la UDR com un dispositiu de baix cost per atendre l'alta complexitat i aconseguir aquest reconeixement per quan arribi el nou sistema de finançament per part del Cat Salut.

# 2. JUSTIFICACIÓ

## 2.1 Rellevància

Atès el que s'ha explicat abans, la UDR-HUB és una eina assistencial rellevant en l'assistència global del nostre hospital i permet agilitzar de manera ambulatòria el procés diagnòstic en pacients amb sospita de patir una malaltia potencialment greu, molt sovint càncer, reduint l' angoixa del malalt i de la seva família, abaratint el cost i alliberant llits d'aguts del Servei de Medicina Interna i d'altres serveis mèdics-quirúrgics de l'hospital. Tot això s'ha demostrat ja parcialment (7) encara que no d'una manera sistematitzada com la que proposem en aquest projecte.

A més a més d' avaluar metòdicament la utilitat clínica de la UDR–HUB, volem saber quin és el nivell de satisfacció dels pacients atesos, tenint en compte que la satisfacció percebuda per part dels pacients, és un criteri major de qualitat assistencial i una eina d'autocontrol de qualitat i millora assistencial(11).

Per augmentar l'eficiència dels serveis de salut aconseguint l'adequat us dels recursos, és necessari prendre la millor decisió de les disponibles, d'aquesta manera

es proporciona als usuaris serveis de salut d'alta qualitat. Els sistemes de salut a nivell mundial han implementat estudis d'avaluació econòmica atesa l' importància d'una correcta gestió de recursos. Diversos estudis econòmics han estat creats amb el propòsit de proporcionar eines útils per a la gestió en salut, és necessari que aquestes tècniques siguin incorporades i implementades pels que prenen decisions, es per això, que finalment volem

conèixer de manera detallada quin és l' impacte econòmic de l' activitat assistencial de la UDR–HUB, matèria sobre el que hi ha poca informació a la literatura (4,5).

## 2.2 Viabilitat

El projecte és clarament viable ja que es compta amb una estructura definida ja des de 2005 amb petits canvis de millora en les vies informàtiques de derivació e incorporació de noves tècniques diagnòstiques com les ja esmentades PAAF de les adenopaties amb estudi anatomopatològic en 30 minuts i la incorporació de proves d'imatge complexes com per exemple el TC-18-FDG de cos sencer. Actualment disposem de dades recollides de més de 1000 pacients atesos a la UDR-HUB durant els anys 2008 a 2011. Es disposa de circuits de recollida de dades i s'utilitzaran estructures logístiques i de maneig/anàlisi de les mateixes.

Com a problema és important tenir en compte que les diferents formes assistencials evolucionen ràpidament i adaptar el nou sistema de pagament a models d'aquest tipus en institucions que depenen de l' ICS és una bona oportunitat perquè van a pressupost però centres que son de la XHUP pot ser més complicar a l'hora de facturar aquesta activitat , de no ser que es reconegui l'alta complexitat d'aquest dispositiu.

## 2.3 Aplicabilitat

Pensem que l'aplicabilitat dels resultats: descripció clínica del pacients atesos, coneixement del nivell de satisfacció dels pacients i anàlisi de l' impacte econòmic pot ser d'aplicació pràctica i necessàriament tindrà un efecte de millora sobre el funcionament de la UDR-HUB. Globalment, aquest projecte ens permetrà disposar d' evidencia objectiva i mesurable sobre l´ eficiència i eficàcia de la UDR-HUB com a alternativa i complementarietat a l´ hospitalització a convencional, amb tots els beneficis potencials que això implica i demostrar que és una estructura amb possibilitats de dur a terme en qualsevol hospital de Catalunya o de la resta de l'Estat Espanyol.

# 3. HIPÒTESI I OBJECTIUS

## 3.1 Hipòtesi

La UDR-HUB permet fer el diagnòstic ambulatori de malalties potencialment greus en un període més curt de temps i amb una relació cost/eficàcia superior a l' hospitalització convencional, amb una acceptació i nivell de satisfacció per part del pacient molt alta.

## 3.2 Objectius

- Anàlisi descriptiu observacional dels pacients avaluats a la UDR–HUB durant el període del 28-03-2008 al 30-06-2012

- Determinació del nivell de satisfacció amb l'assistència rebuda, de una sèrie de més de 150 pacients atesos consecutivament a la UDR-HUB de març de 2012 a octubre de 2012.

- Quantificació del cost de l' activitat de la UDR-HUB en una sèrie de pacients amb diagnòstic final de limfoma, neoplàsia de pulmó i anèmia en comparació amb pacients ingressats al servei de Medicina Interna per les mateixes patologies.

- Creació del MAPA de procés de la UDR

# 4. METODOLOGIA DELS OBJECTIUS

## 4.1.1 Objectiu 1: Anàlisi descriptiu observacional de pacients avaluats a l' UDR-HUB en el període descrit anteriorment

- Disseny: Estudi observacional descriptiu
- Població d'estudi: Pacients atesos a la UDR–HUB
- Variables i recollida d'informació: les dades es recullen de forma prospectiva en un full dissenyat a l'any 2008 (Annex 2 ) i posteriorment en una base de dades tipus "*Access*" per poder realitzar l'anàlisi de les dades. S'han recollit les següents variables:
  - ✓ Sexe
  - ✓ Edat

- ✓ Origen de la derivació: atenció primària, urgències, diferents serveis de l' hospital i d'altres.
- ✓ Comprovar si la derivació compleix o no els criteris preestablerts.
- ✓ Analitzar el motiu de la derivació.
- ✓ Interval a la primera visita(mesurat en dies des de la sol·licitud de la consulta fins a la primera visita a la unitat).
- ✓ Mesurar l' interval diagnòstic (temps transcorregut des de la primera visita fins a l' obtenció del diagnòstic).
- ✓ Analítiques i proves complementàries realitzades i data de realització (hemograma, bioquímica, serologies, radiologia simple de tòrax o abdomen, ecografia, fibroscòpia alta, colonoscòpia, gammagrafia nuclear, TC d'uteroabdominal, PAAF , PET 18FDG de cos sencer i d' altres).
- ✓ Tipus de prova diagnòstica i data de la seva realització.
- ✓ Data del diagnòstic (data de la prova diagnòstica encara que no hi hagi confirmació histològica).
- ✓ Nombre de visites realitzades a cada pacient.
- ✓ Ràtio primeres visites/segones visites.
- ✓ Tipus de tractament.
- ✓ Destí a l'alta de la UDR-HUB.
- ✓ Classificació diagnòstica ( diagnòstic etiològic, d'exclusió, no diagnòstic).

### 4.1.2 Objectiu 2: Determinació del nivell de satisfacció dels pacients atesos a la UDR-HUB

- Disseny: Estudi prospectiu transversal observacional. Enquesta de satisfacció anònima.

- Població: S'espera avaluar 150 pacients atesos consecutivament a la UDR-HUB en el període des de març de 2012 fins al 31 d'octubre de 2012.
- Mètode: Enquesta de satisfacció (Annex 3), es farà servir una enquesta adaptada a la dissenyada per l'Associació d'Uròlegs de la Universitat de Columbia(12), emprarem aquesta enquesta perquè ha estat utilitzada amb bon resultat en diferents estudis sobre el nivell de satisfacció fets a l'Estat Espanyol en l'atenció ambulatòria de medicina preventiva, urològica i al·lergologia(13-15). S'afegiran dues preguntes:

    1) Prefereix aquest sistema d'estudi ambulatori o escull l' ingrés a l'hospital?
    2) Li ha representat una dificultat haver de desplaçar-se a l'hospital per a realitzar-se diferents proves?

### 4.1.3Objectiu 3: Anàlisi de minimització de costos (AMC) de la UDR

- Avaluació econòmica. Amb l'objectiu de seleccionar entre les existents aquelles intervencions per les que en conjunt, les avantatges i beneficis aconseguits són màxims una vegada deduïts els costos d'oportunitat, garantint l'obtenció dels mateixos resultats d'eficàcia i/o efectivitat
- Disseny. Anàlisi de Minimització de Costos.
- Població. Pacients atesos a la UDR-HUB i que hagin estat derivats per qualsevol motiu. Es farà avaluació comparativa del cost UDR envers del cost d´ hospitalització pels diagnòstics: *limfoma, anèmia, neoplàsia de pulmó*.

(*)consultar bibliografia

A l'objectiu s'avaluarà:

Cost econòmic directe de la UDR-HUB: Cost de personal, material sanitari i farmàcia.
Costos indirectes imputables d'altres unitats: Hoteleria, esterilització, neteja, manteniment i administració.
Altres despeses: Despeses estructurals repercutides.

El resultat mostrarà les diferències individualitzades per cada diagnòstic en funció de la via d'actuació, també s'avaluarà el cost de les proves complementàries fetes fins arribar a un diagnòstic i analitzant l'estalvi d'ingrés podrem saber el nombre de llits alliberats en el Servei de Medicina Interna o d' altres Serveis de l' HUB.

## 4.2 Anàlisi estadística

Per a la descripció de les variables qualitatives es presentaran les freqüències i el percentatges de cada nivell de la variable analitzada.

Per a la descripció de les variables quantitatives s'utilitzaran mètodes estadístics descriptius, inclouen: mitja, mitjana, rangs, desviació estàndard e interval de confiança del 95% per a la mitja.

Les variables ordinals es descriuran a la vegada com qualitatives i quantitatives.

A l'anàlisi inferencial de les variables qualitatives i quantitatives s'aplicarà la següent estratègia:

- Per a les dades qualitatives (dades categòriques o nominals), la comparació de les variables es realitzarà amb la prova del Chi Quadrat o la prova exacta de Fisher.

- Per a la comparació de les variables quantitatives amb distribució gaussiana es farà servir la prova de la t de Student (mitjanes de dos grups) o la prova ANOVA (mitjanes de tres o més grups).

- Per a la comparació de les variables ordinals i continues no gaussianes s'utilitzarà la prova de la de Mann-Whitney.

## 4.3. Limitacions

Des de 2008 existeix un full de recollida de dades i es disposa de tots els ítems descrits a la part metodològica, es farà un anàlisis retrospectiu d'aquestes dades. De totes manera destacar que les dades s'han recollit sistemàticament de forma prospectiva en un full de dades.

# 5. RESULTATS DELS OBJECTIUS

Amb l'estudi de l'**objectiu 1** s'espera obtenir una visió molt detallada sobre l'activitat clínica assistencial que es dur a terme a la UDR-HUB: perfil socio-demogràfic dels pacients, els serveis que deriven als pacients, aplicació correcta o no dels criteris de derivació, temps per a la primera visita i per a cada una de les proves diagnòstiques, interval al diagnòstic, tipus de diagnòstics i destí del pacient després de l' avaluació.

Amb l'assoliment de l'**objectiu 2** coneixerem quin és el nivell de satisfacció i quins punts febles, des de la perspectiva dels pacients, són susceptibles de millora.

Finalment, l'acompliment de l'**objectiu 3** ens donarà informació mesurable i objectiva del rendiment econòmic de la UDR-HUB comparativament amb l' hospitalització convencional.

## 5.1 Objectiu 1: Anàlisi descriptiu observacional de pacients avaluats a l' UDR-HUB en el període descrit anteriorment

*Veure article 1:* Sanclemente-Ansó C, Salazar A, Bosch X, Capdevila C, Vallano A, Català I, Fernandez-Alarza AF, Rosón B, Corbella X. **A quick diagnosis unit as an alternative to conventional hospitalization in a tertiary public hospital: a descriptive study. Pol ArchMedWewn. 2013; 123(11):582-8.**

Durant el període d'estudi, es van avaluar 1.226 pacients malalts, dels quals 634 (51,7% ) eren homes, amb una edat mitjana de 60,5 anys (SD = 17,5 , rang 16-102). Les primeres 1.226 visites van generar 861 visites successives (relació visita successiva/primera = 0,70 ). La majoria dels pacients (n = 806, 65,7%) van requerir només dues visites.

**La taula 1** mostra el nombre de pacients atesos, el seu origen, el temps per a la primera visita i el temps de diagnòstic per a cada un dels anys estudiats. Un total de 648(52,9%) dels pacients van ser remesos des del servei d'urgències, 535(43,6 %) dels CAP i 43(3,5%) pacients de les consultes externes de l'hospital; 1.094(89,2%) dels pacients van complir amb els criteris per a la indicació preestablerta adequada per a la seva remissió a la UDR i els restants 10,8% no complien amb aquests criteris. Més pacients de l' Atenció primària (AP) (n = 463, 86,5%) i de les consultes externes de l´ hospital (n = 37; 86%) van complir amb els criteris d'adequació de referència que els remesos del servei d'urgències (n = 517, 79 ,8%).

El temps mitjà fins a la primera visita va ser 3,5 (SD 5,3) dies. El temps mitjà fins al diagnòstic va ser de 12,2 (SD 14,7) dies.

**La taula 2** mostra els motius de consulta més freqüents, on les sis raons principals (80,5% del total) van ser limfadenopatia persistent en 297 (24,2%) dels casos, la pèrdua de pes involuntària en 187 (15,3 %), tumors sospitosos de malignitat en 169 (13,8%), anèmia en 154 (12,6%), dolor abdominal en 106(8,6%), alteracions radiològiques pleuro-pulmonars en 74(6%), canvis del ritme deposicional 36 (2,9%), dolor ossi /reumàtic 23 (1,9%), vessament pleural 15 (1,2%), síndrome febril 14 (1,1%) i icterícia no obstructiva 14(1,1%).

**La taula 3** mostra les principals proves complementàries realitzades. Hi havia una mitjana de 2,5 exàmens addicionals per pacient (SD 1,7). No es van realitzar exploracions complementàries en 192 (15,6 %) pacients. Les proves van incloure 297 citologies i, entre elles 9 citometries de flux, (F - 18 FDG),es van realitzar en 115 pacients PET / CT.

Les raons més freqüents per sol·licitar les proves van ser la limfadenopatia en 37 (32,2 %) dels casos, la pèrdua de pes involuntària i sense símptomes indicatius d'un

procés neoplàsic en 35 casos (30,4%), en tumors en 19 (16,5 %) dels casos i alteracions radiològiques suggestives de càncer de pulmó en un total de 8 (7%).

El diagnòstic etiològic es va obtenir en 926 (75,5%) pacients, un diagnòstic d'exclusió en 243(19,8%), un diagnòstic probable en 13 (1,1 %) i el procés de diagnòstic no es va completar en 44(3,6%) dels pacients .

**La taula 4** mostra els diagnòstics finals més comuns. Un total de 324 (26,4%) pacients tenien càncer: es va obtenir la confirmació citològica o patològic del diagnòstic en el 92,1 %. El diagnòstic va ser d'un tumor sòlid en 246 (75,9%) dels casos, el limfoma en 64 (19,8%) i diverses formes de malignitat hematològica en 14 (4,3 %).

Cal dir que les anèmies ferropèniques s'estudien a l'atenció primària, excepte aquelles amb un alt risc de neoplàsia, la resta es va pactar que serien estudiades pel seu metge de família. Els tumors sòlids més freqüents van ser digestius en 123(46,6 %) pacients, de pulmó en 35 (13,3 %), de cap i coll en 25 (9,5 %) , ginecològiques en 26 (9,8%) i nefro-urològics en 24 (9,1 %) ( Taula 6 ).

L´ estudi amb Punció Aspiració Agulla Fina (PAAF) va confirmar el diagnòstic de limfoma en 64 casos i va mostrar adenitis reactiva inespecífica en 91 casos . En 11 casos, l'estudi per PAAF mitjançant PCR de micobacterium tuberculosis va confirmar tuberculosi nodal com l'única manifestació de la tuberculosi i amb confirmació microbiològica en tots els casos.

El segon diagnòstic més freqüent va ser l'anèmia no associada amb el càncer en 106 (8,6%) casos sent la causa la deficiència de ferro en 73 casos, la deficiència de vitamina B12 en 12, múltiples factors en 11, l'hemorràgia postoperatòria en 4 i per causes desconegudes en 6 casos.

Després de completar l'estudi diagnòstic, 643 (52,4%) pacients van ser remesos al seu metge d'atenció primària i 507 (41,3%) per a les consultes externes hospitalàries. A causa del seu mal estat, 11 (0,9%) pacients van ser enviats al servei d'urgències i 65 (5,3%), van ingressar a l´ hospital a causa de complicacions en el procés diagnòstic o empitjorament de la condició general que no permetien continuar els estudis ambulatoris.

La UDR va evitar l'hospitalització convencional per a estudis de diagnòstic en 870 (71,5%) dels pacients, el que representa una mitjana d'alliberament de 7 llits de Medicina Interna per dia.

## DISCUSSIÓ

Durant el període d'estudi, es van avaluar 1.226 pacients, generant 861 visites successives. El nombre anual de pacients no va variar significativament durant el període d'estudi.

La remissió de forma adequada dels pacients a la UDR és fonamental per la seva eficàcia. El perfil típic era un pacient amb una malaltia potencialment greu, però amb una bona salut general, que va permetre l'estudi ambulatori. En el nostre estudi, el 89,2 % dels pacients remesos van complir els criteris de derivació preestablerts, lleugerament superiors als reportats per altres UDR[4,16]. El 10,8% restant dels pacients que no complien amb aquests criteris probablement haurien d'haver estat avaluats per altres modalitats d'assistència sanitària, com metges de família o unitats funcionals multidisciplinàries específics (per exemple , de pulmó o de mama). En quant al primer any de funcionament de la UDR, podria ser considerat un any d'adaptació, es va excloure de l'anàlisi, i el percentatge s'eleva al 93,3%.

Menys pacients del servei d'urgències (79,8%) van complir els criteris d'adequació de referència que els de centres primaris de salut (86,5%) i les clíniques de pacients ambulatoris de l'hospital" (86%). Això es podria explicar per la ràpida rotació dels residents en el servei d'urgències i el fet que alguns d'ells prenen les decisions de derivació a la UDR, i poden no estar prou ben informats dels criteris de derivació.

La majoria dels pacients van ser remesos des del servei d'urgències (51,9%) i centres primaris de salut (43,7%), xifres similars a les d'altres UDR (16,17) .

El temps mitjà fins a la primera visita va ser de 3,5 dies, es va reduir de 9,4 dies del 2008 a 0,3 dies al 2012 , sens dubte, a causa d'una millor selecció dels pacients amb criteris de derivació prèviament acordats. El temps mitjà de diagnòstic va ser de 12,2 dies, superior als 9,4 dies trobats per Bosch et al.(16) i 5,7 dies per Capell et al.(4) : aquesta es va reduir a 6,9 dies el 2012, a causa del desenvolupament de nous circuits de diagnòstic per a les proves d'imatge i endoscòpia, s'ha de tenir en compte l'any 2010 on s'allarga el temps diagnòstic atès l'aplicació de les mesures d'ajustament econòmic per la crisi econòmica, que va fer disminuir l'oferta d'exploracions complementaries, augmentant llista d'espera. La durada del període diagnòstic en el període 2009-2011 era pitjor, probablement a causa de la necessitat de reajustaments en l'atenció derivades de la crisi econòmica a Espanya.

Els principals motius de consulta van ser, en ordre de freqüència, adenopaties sospitoses de malignitat, pèrdua involuntària de pes, tumors reals o sospitosos, anèmia, dolor abdominal i alteracions en la radiografia simple i tomografia, que en conjunt van representar el 74,5% dels casos. Curiosament, mentre que en la sèrie per Bosch et al, l'anèmia va ser el principal motiu de consulta al 27,5% pacients(17), l'anèmia en la nostra sèrie va ser motiu de consulta només en el 12,6% dels pacients, això es deu al fet que, d'acord amb els criteris de derivació acordats amb

l'atenció primària, l'anèmia ferropènica es va estudiar en aquest àmbit, excepte per als pacients amb alta sospita de neoplàsia.

A més, mentre que limfadenopatia va ser el motiu de consulta al 10,6% dels pacients de la sèrie per Bosch et al (7) i el 4,7% en l'estudi de Capell et al (4) , en la nostra UDR, la limfadenopatia va ser la principal causa de consulta (24,2 %). Això es deu a la introducció d'un circuit preferencial protocol·litzat, que ha estat molt publicitat en l'atenció primària, per a la realització de PAAF de ganglis i tumors accessibles, que va ser creat en conjunt amb el departament d'anatomia patològica.

L'alta taxa de consultes per la pèrdua involuntària de pes i la síndrome de l'anèmia és una troballa freqüent en altres UDR, això es deu al fet que aquests dos processos són les principals causes d'hospitalització per a les proves de diagnòstic a l'Estat Espanyol(18). Un estudi que va avaluar l'adequació de l'hospitalització en un servei de Medicina Interna va trobar que en el 70 % dels casos, les hospitalitzacions per la pèrdua de pes involuntària era inapropiada (3). L'avaluació per la UDR pot ser útil en la reducció d'ingressos inadequats a causa d'aquestes patologies .

El principal diagnòstic final va ser de càncer en 324 (26,4%) dels pacients. Confirmació del diagnòstic citològic o patològica es va obtenir en el 92,1 % dels casos. Seixanta-quatre (19,7 %) dels pacients tenien limfoma i 14 (4,3%) les neoplàsies malignes hematològiques. L'elevat nombre de limfomes de nou es pot atribuir al circuit preferencial per a l'avaluació ràpida d'adenopaties. De les PAAF negatives per limfoma, 91 eren adenitis inespecífiques i destacar que en 11 casos la tuberculosi nodular va ser diagnosticada com a única manifestació de la malaltia. Els tumors sòlids més comuns van ser d'origen gastrointestinal (50% dels pacients). El baix percentatge de pulmó , de mama, ginecològic, urològic i de cap i coll, sens

dubte és a causa de l'existència d'unitats funcionals especialitzades per a cada un d'aquests tipus de càncer en un hospital de tercer nivell com el nostre.

L'avaluació de la UDR per evitar l'hospitalització per a l'estudi de diagnòstic en el 71,5% dels pacients, en comparació amb 53,7% en la sèrie de Capell et al (4) i el 41 % a la sèrie per Bosch et al (16), el que va portar a l'alliberament de 7 llits de Medicina Interna per dia durant el període d'estudi, i el consegüent estalvi econòmic .

Des de la introducció de la Unitat de Diagnòstic Ràpid en la Queen Elizabeth Hospital, Birmingham en 1996(6), s'han creat diverses UDR per a l'atenció especialitzada dels diferents tipus de càncer. No obstant això, la majoria de UDR depenen de serveis de Medicina Interna, com la descrita en aquest estudi.

Presentacions clíniques freqüents amb símptomes inespecífics, com la pèrdua involuntària de pes, anèmia i adenopatia en persones generalment sanes amb malaltia potencialment greu suggereix la necessitat d'un estudi ambulatori en UDR dirigit per especialistes en Medicina Interna.

En estudis comparatius amb hospitalització convencional per al procés de diagnòstic, les UDR han demostrat ser igualment eficaces, menys costoses i amb major satisfacció dels pacients per a l'estudi de possibles malalties greus.

En conclusió, la UDR pot ser una alternativa viable i segura a l'ingrés hospitalari convencional per al diagnòstic de pacients amb sospita de malaltia greu. Adequadament gestionat i donant suport, pot reduir la necessitat de llits d'hospital.

# Taula 1. Indicadors de la Unitat de Diagnostic Ràpid 2008-2012

Ucies: urgències, AP: atenció primària, CEX: consultes externes hospital

| Any | Primeres visites n | Visites successives n (successives/ primeravisita ratio) | Procedència n (%) | | | Dias para una primera visita (mitjana ± SD) | Dies de diagnòstic (Mitjana± SD) | Destí a l´alta n (%) | | | | Adequació n (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ucies | AP | CEX | | | Ucies | AP | CEX | Ingréshospitalari | |
| 2008 | 290 | 163(0.56) | 204(70.3) | 80(27.6) | 6(2.1) | 9.4 ± 7.4 | 9.5 ± 11.2 | 4(1.4) | 182(62.8) | 84(29) | 20(6.9) | 210(72.5) |
| 2009 | 272 | 157(0.57) | 134(49.3) | 136(50) | 2(0.7) | 3.0 ± 3.5 | 11.9 ± 14.5 | 3(1.1) | 119(43.7) | 135(49.6) | 15(5.5) | 246(90.6) |
| 2010 | 252 | 192(0.76) | 111(44.1) | 133(52.7) | 8(3.2) | 1.9 ± 2.0 | 16.8 ± 18.6 | 4(1.6) | 138(54.7) | 99(39.3) | 11(4.4) | 239(94.3) |
| 2011 | 266 | 220(0.82) | 131(49.2) | 127(47.7) | 8(3.1) | 1.0 ± 1.1 | 13.8 ± 15.4 | 0 | 133 (50) | 120(45.1) | 13(4.9) | 252(94.7) |
| 2012 (6 mo) | 146 | 111(0.78) | 68(46.6) | 59(40.4) | 19(13.0) | 0.3 ± 0.7 | 6.9 ± 8.7 | 0 | 71 (48.6) | 69(48.6) | 6(4.1) | 137(93.8) |
| Total | 1226 | 861(0.70) | 648(52,9) | 535(43.6) | 43(3,5) | 3.5 ± 5.3 | 12.2 ± 14.7 | 11 (0.9) | 643 (52.4) | 507(41.3) | 65(5.3) | 1094(89.2) |

Ucies: urgències, AP: atenció primària, CEX: consultes externes hospital

## Taula 2. Motius de consulta

| **Motius de consulta** | **n (%)** |
|---|---|
| Adenopaties / masses palpables | 297(24.2) |
| Pèrdua de pes involuntaria | 187(15.3) |
| Sospita de tumors | 169(13.8) |
| Anèmia | 154(12.6) |
| Dolor Abdominal | 106(8.6) |
| Alteracions pleuropulmonars | 74(6.0) |
| Alteracions del ritme deposicional/diarrea crónica | 36(2.9) |
| Dolor ossi | 23(1.9) |
| Vessament pleural | 15(1.2) |
| Sindrome febril | 14(1.1) |
| Ictericia no obstructiva | 14(1.1) |

## Taula 3. Exploracionscomplementàries

| **Exploracionscomplementàries** | **n (%)** |
|---|---|
| Anàlisis de sang | 714(58.3) |
| Radiografia simple | 249(20.3) |
| Citologia/PAAF | 297(24.1) |
| Ecografia abdominal | 293(23.9) |
| TAC | 281(23.6) |
| Colonoscòpia | 194(15.8) |
| Endoscòpia digestiva alta | 184(15.0) |
| Biopsies | 120(9.9) |
| Body (F-18 FDG) PET/CT | 115(9.4) |
| Electrocardiograma | 108(8.8) |
| Trànsit esòfag-gàstric | 44(3.6) |
| Enema Opaca | 61(5.0) |
| Gammagrafia òssia | 41(3.3) |
| Aspirat de moll de l´ós | 32(2.6) |
| Ecografia ginecològica | 26(2.2) |
| Urocultius/hemocultius/cultiusd´esput | 39(3.2) |
| Ressonància Magnètica Nuclear | 28(2.3) |
| Fibrobroncoscòpia | 15(1.2) |
| Mamografia | 13(1.1) |
| Serologies | 29(2.4) |
| Test de la tuberculina | 10(0.8) |
| Citometria de flux | 9(0.7) |
| Eco-dopplervenós | 9(0.7) |
| Biòpsia del moll de l´os | 5(0.4) |
| Proves de funció respiratòria | 3(0.2) |
| Electromiografia | 3(0.2) |
| Holter cardiac | 2(0.2) |

**Taula 4. Diagnòstics més freqüents de la Unitat de Diagnòstic Ràpid**

| **Diagnòstics** | **n (%)** |
|---|---|
| Neoplasia maligna | 324(26.4) |
| Tumors sòlids | 246(75.9) |
| Limfoma | 64(19.8) |
| Altres hematològiques | 14(4.3) |
| Anèmia | 106(8.6) |
| Adenitis reactiva | 91(7.4) |
| Alteracions digestives | 91(7.4) |
| Alteracions tiroidals | 38(3.1) |
| Alteracions reumàtiques/òssies | 33(2.7) |
| Alteracions cardio-respiratòries | 28(2.3) |

**Taula 5. Descripciótumorssòlids**

| **Tumors sòlids** | **264** |
|---|---|
| | **n (%)** |
| **Digestius** | **123(46.6)** |
| Colon | 45(36.6) |
| Bilio-pancreàtic | 36(29.3) |
| Gàstric | 23(18.7) |
| Fetge | 10(8.1) |
| Esòfag | 9(7.3) |
| **Cap iColl** | **25(9.5)** |
| *oïda*,nas i gola | 14(56) |
| Paròtida | 6(24) |
| Tiroides | 5(20) |
| **Pulmó** | **35(13.3)** |
| **Nefro-urològic** | **24(9.1)** |
| Pròstata | 9(37.5) |
| Ronyó | 11(45.8) |
| Bufeta | 4(16.6) |
| **Ginecològic** | **26(9.8)** |
| **Càncer d´origen desconegut** | **11(4.2)** |
| **Tumors ossis i de parts toves** | **6(2.3)** |
| **Melanoma** | **4(1.5)** |
| **Tumors cerebrals** | **3(1.1)** |
| **Altres tumors** | **7(2.7)** |

## 5.2 A l'Objectiu 2. Determinació del nivell de satisfacció dels pacients atesos a la UDR-HUB

Veure Article 2: Carmen Sanclemente-Ansó, Albert Salazar, Xavier Bosch, Cristina Capdevila, Amparo Giménez-Requena, Beatriz Rosón-Hernández, and Xavier Corbella. **Perception of quality of care of patients with potentially severe diseases evaluated at a distinct quick diagnostic delivery model: a cross-sectional study BMC Health Serv Res. 2015; 15: 434.**

El nivell de satisfacció dels usuaris dels serveis de salut pública és un bon indicador de la qualitat percebuda de l'atenció de salut, ja que avalua no només el resultat global de l'atenció, sinó també el seu procés i estructura. És, per tant, un important criteri de qualitat aquest anàlisi que permet la identificació d'àrees de millora potencial en el replantejament de l'atenció del procés.

La satisfacció del pacient atès a les UDR ha estat mal avaluat. El nostre objectiu ha estat determinar el nivell de satisfacció dels pacients atesos en una UDR de Medicina Interna d'un hospital terciari públic espanyol per tal de detectar les àrees susceptibles de millora .

La nostra UDR tal i com mostra l'objectiu1, ha avaluat 1.226 pacients en aquesta anàlisi descriptiva de tall transversal , es van seleccionar 162 pacients consecutius avaluats per participar en una enquesta de satisfacció . El qüestionari ( annex.3 ) va ser una adaptació espanyola dels Uròlegs Associats , Enquesta de Satisfacció del Pacient ( Columbia , Missouri , EUA ) (19) i es va escollir per a què ha estat validada i utilitzada en altres estudis espanyols sobre la qualitat de l'atenció en pacients ambulatoris(20–21),l'enquesta consta de 20 preguntes, amb variables soci demogràfiques i en una escala Likert , les condicions físiques de la unitat, i comentaris sobre la cura personal rebudes, la qualitat de la informació de diagnòstic i de la durada dels símptomes . Hi va haver també una pregunta sobre en quina mesura el pacient recomanaria la UDR a un parent amb un procés similar (escala

analògica visual d'1 a 10). Finalment, hi va haver una pregunta oberta "Què podem fer millor " per detectar les mesures susceptibles de millora i altres suggeriments .

L'enquesta va ser passada pel metge de la UDR o infermera i els pacients van tenir prou temps i espai privat per respondre en forma anònima i voluntària per escrit . Els pacients que requereixen més d'una visita responen les preguntes de l´ 1 a la10 en la primera visita i la resta en la visita final . L'estudi va ser aprovat pel comitè d'ètica de l'Hospital Universitari de Bellvitge i l'enquesta va ser validada internament pel servei de qualitat de l'hospital.

A l'anàlisi estadística es van obtenir dades descriptives de la mostra . Es van avaluar les variables nominals i ordinals mitjançant la prova de Khi2 . La relació entre els diversos factors i el grau de satisfacció es va examinar mitjançant anàlisi de la variància ( ANOVA ) . El nivell de significació estadística es va establir com $p < 0,05$ . L'anàlisi es va realitzar mitjançant l'SPSS v21 per al paquet estadístic de Windows .

## RESULTATS

Dels 162 pacients inclosos, 159 (98%) van respondre a l'enquesta. L'edat mitjana va ser de 60,5 anys, i 84 (52,8%) dels pacients eren homes ( Taula 7 ). Quaranta-vuit pacients (30%) pacients van tenir cap escolaritat, 64 (40%) tenien educació primària, 32 (20,%) la formació secundària o professional, i 15 (9%), l'educació universitària. Havien assistit a una clínica ambulatòria o equivalent d'un altre hospital un total de 93 pacients (59%).

La satisfacció amb les característiques físiques de la UDR va ser alta: 152(95,6%) considera que les condicions de temperatura , el soroll i la neteja van ser millors del

que s'esperava i 154(96,9%) considera senyalització era adequada i la unitat fàcil de trobar.

Els resultats sobre la satisfacció dels pacients van mostrar que el nom del metge va ser recordat per 154 (97%) i el nom de la infermera per 129 (81%) pacients . De la mateixa manera , 156 enquestats (98,1%) van considerar que el personal de la UDR era sempre amable i 2 (1,3 %) gairebé sempre , i 156 (98,1%) van declarar que havien rebut ajuda del personal sempre que ha havia estat necessari, 92 (57,9%) va considerar que l'atenció durant la visita va ser molt millor del que s'esperava i 65 (40,9%) , millor del que s'esperava . El temps d'espera fins a la primera visita (des de la detecció del problema fins a la primera avaluació en la UDR) es percep com a molt curt en 84 pacients (52,8%), curt en 34 (21,4%) i correcte en 39 (24,5%) . Al final de l'avaluació de la UDR, 153 pacients (96,2%) van afirmar conèixer el seu diagnòstic i 6 (3,8 %) no (dels quals 4 tenien cap educació formal i 2 només l'educació bàsica ).

El temps fins al diagnòstic (12,19 dies) es va considerar molt curt per 68 (42,8 %) pacients, curt per 41 (25,8 %), correcte per 41 (25,8 %) i l'excessiu de 9 (5,7%) pacients. Dels 159 pacients, 56 (35,2 %) havien estat prèviament ingressats al nostre hospital.

Pel que fa a la satisfacció amb la informació rebuda, 140 (88,1%) dels pacients van afirmar que sempre reben la informació correcta sobre la malaltia, 153 (96,2%) en les proves de diagnòstic, 147 (92,5%) en el risc involucrat en les proves de diagnòstic i 157 (98,7%) va afirmar que sempre van rebre informació sobre les instruccions a seguir després de l'alta. Onze (6,9%) dels pacients van afirmar que el anar a l'hospital en qüestió era incòmode, 6 (3,8%) i hagués preferit ingrés hospitalari per

fer les proves de diagnòstic, i 4 (2,5%) dels pacients eren incapaços de escriure el seu diagnòstic final .

Així mateix, 129 pacients (81,1%) van afirmar que recomanarien consulta UDR a un familiar sense dubtar-ho(puntuació de 10 /10), 25 (15,7%) van anotar 8 a 9 /10, 4 (2,5 %) anotar 7/10, i un ( 0,6% ) van anotar 5/10; cap pacient va anotar per sota de 5. Es va avaluar si tenir un diagnòstic de càncer es relaciona amb el grau de satisfacció mitjançant la comparació dels 41 pacients amb diagnòstic de càncer amb el 118 sense càncer, i es va trobar una tendència no significativa cap a un menor grau de satisfacció ( p = 0,084 ) .

La resposta més freqüent a la pregunta "Què podem fer millor" era "res", en 134 (84,3%) dels pacients . Els pacients restants no van fer cap suggeriment .

## DISCUSSIÓ

Encara que existeix abundant investigació sobre el nivell de satisfacció amb la qualitat d'atenció rebuda pels pacients ambulatoris , hi ha pocs estudis sobre la satisfacció percebuda pels pacients que assisteixen a una UDR [4,10], fins on sabem , només un informe de Bosch et al entrevisten telefònicament 155 pacients atesos a una UDR amb característiques similars utilitzant una enquesta de 20 ítems[10], validat internament , que avalua els següents aspectes de la UDR : percepció del procés d'atenció , grau de dificultat dels viatges a la unitat , la satisfacció general , el tipus d'atenció preferent en el futur i les condicions de l'espai físic . Es va obtenir el consentiment verbal abans que es va passar l'enquesta, que es va realitzar tres mesos després de la intervenció . La participació va ser del 85% . Les principals conclusions van ser que la satisfacció general amb l'atenció a la UDR va ser alta en el 95% dels casos, repetir viatges a l'hospital , no es va considerar una de les principals

dificultats i , si es necessitaven més proves de diagnòstic , el 80 % dels pacients prefereixen el model d'atenció a UDR que l'hospitalització convencional(10).

Els resultats trobats per Bosch et al van ser molt similars als d'una enquesta que va avaluar la satisfacció dels pacients que acudeixen a la UDR de Medicina Interna en un hospital de segon nivell , que es publiquen en una revista espanyola(4). Els autors van dur a terme dues enquestes de satisfacció per telèfon 3 mesos i 2 anys després de la introducció d'una UDR i dos mesos després de l'alta del pacient mitjançant una enquesta validada internament consistent en 20 preguntes d'opció múltiple (4 opcions) que van avaluar els següents aspectes : la percepció del procés d'atenció, el grau de dificultat dels viatges a la UDR , la satisfacció general , la preferència per tipus d'atenció en els episodis posteriors i les condicions de l'espai físic . L'enquesta va ser contestada pel 65 % i el 85 % dels pacients , respectivament . La satisfacció general va ser del 95 %, els viatges a l' hospital no era una dificultat important i el 80 % dels pacients prefereix el model d'atenció UDR a l'hospitalització convencional .

Creiem que el nostre estudi se suma als coneixements adquirits per les enquestes esmentades sobre la percepció de la qualitat de l'atenció dels pacients que assisteixen a una UDR de Medicina Interna . La taxa de resposta a l'enquesta (98,1%) va ser més gran que la trobada en estudis anteriors i per tant , la mostra pot ser més representativa (17,4,22).

Passar l'enquesta al final de la primera visita de forma consecutiva evita el biaix que pot produir-se quan només els pacients més satisfets responen . La satisfacció global , mesurada per la pregunta de si recomanaria la UDR a un parent , era molt alta , amb 154 ( 96,8% ) pacients puntuació > 8.

Dels nostres pacients, el 70,4 % tenien cap o només educació bàsica . Això és consistent amb els estudis demogràfics previs realitzats en el nostre medi la salut i

pot ser important , ja que , encara que hi ha discrepàncies, 13 estudis han conclòs que els baixos nivells d'educació dificulten l'assimilació d'informació , principalment en relació amb el diagnòstic i les instruccions a l'alta, i que això té un impacte negatiu en les variables de satisfacció, (23,24) en el nostre estudi , tot i el baix nivell de l'educació , la percepció sobre la informació sobre la malaltia , les proves de diagnòstic i les instruccions a seguir després de l'alta , va ser molt satisfactori , amb satisfacció que oscil·la entre 96% i 98 %. De fet , un dels 4 pacients que van informar no conèixer el seu diagnòstic al final de l'avaluació (és a dir , eren incapaços d'escriure el seu diagnòstic final), 2 mancaven d'escolaritat i 2 havia completat l'educació bàsica.

Això és important perquè la informació detallada , fàcilment disponible sobre els riscos del diagnòstic i el tractament és un aspecte important de la relació metge - pacient i no hi ha evidència que una major educació es correspon amb una major satisfacció(21).

L'objectiu de la qualitat de l'atenció sanitària ara s'entén que inclou l'opinió del pacient en els aspectes tangibles com l'estat físic de la unitat , el temps d'espera i la puntualitat en l'assistència a pacients (25). En tots aquests temes , hi va haver un alt grau de satisfacció, amb resultats superiors als reportats en estudis similars(4,22).

En el tractament ambulatori , especialment en la UDR , on el risc de malaltia severa és sovint alta i causa preocupació i ansietat , avaluar la percepció dels aspectes de la qualitat subjectiva , com l'accessibilitat , la integritat personal o l'amabilitat i l'empatia dels professionals del pacient és important . Això es reflecteix en aspectes com recordar el nom del metge : un metge que es presenta al pacient s'ha demostrat que augmenta la receptivitat del pacient i la satisfacció (23 ,21,26). En el nostre estudi, el 96,9 % dels pacients recordava el nom del metge i el 81,1 % el de la

infermera. Aquestes xifres són molt superiors als obtinguts en altres enquestes de satisfacció de pacients ambulatoris a Espanya (21,23).

Es va identificar un aspecte de la UDR que podria millorar-se. Tot i que el temps mitjà entre la primera visita i el diagnòstic va ser de 6,9 dies, un temps considerat raonable en aquest tipus d'unitat , aquest temps podria escurçar-se. No obstant això, en el període 2009-2011, el temps fins al diagnòstic va ser 12,2 dies, possiblement a causa de les alteracions en l'atenció mèdica a conseqüència de la crisi econòmica espanyola. La reducció de 12,2-6,9 dies va ser probablement a causa de la introducció de nous circuits per a les proves d'imatge (dades no publicades) i a l'endoscòpia. Aquesta troballa il·lustra el concepte que el grau de satisfacció del pacient es determina per la relació entre l'esperada i la qualitat percebuda i , per tant, no depèn exclusivament de la qualitat tècnica que el sistema de salut.

El nostre estudi té algunes limitacions. Aquest va ser un estudi transversal, de manera que només ofereix una instantània de la satisfacció. Altres estudis poden indicar si la satisfacció ha augmentat o disminuït . De la mateixa manera, l'estudi es va dur a terme en un únic centre: comparacions amb pacients de les UDR en altres hospitals podrien haver estat més valuosa. No obstant això, d'acord amb informes publicats, els pacients de UDR són prou representatives de les d'altres UDR (4,7,10, ,27-29).

Finalment, mentre que el model UDR pot ser més adequat per als sistemes públics de salut , especialment en el context de la reducció de les despeses de salut a causa de la crisi econòmica , també hi ha una necessitat de reduir els costos i l'ús excessiu del servei d'urgències i evitar ingressos innecessaris en els sistemes de salut (30,31).

En resum, els resultats de l'enquesta de satisfacció que els pacients que assisteixen a la nostra UDR , la majoria sospitosos de patir una malaltia greu , tenien un alt grau de satisfacció amb l'atenció personal i mèdica rebuda. Tot i que aquests resultats

confirmen els d' altres estudis que mostren una bona acceptació per part dels pacients d'aquest tipus d'atenció , el nostre estudi va ser la informació específica de la secció transversal i va reunir al llarg d'un període de 6 mesos. Les enquestes de satisfacció són eines que s'utilitzen i es repeteixen periòdicament per supervisar el nivell de qualitat percebuda pels pacients per tal de detectar possibles deficiències corregibles. L'administració d'aquesta enquesta en un altre UDR podria ajudar a detectar àrees susceptibles de millora.

### Taula.6. Característiques dels pacients

| | |
|---|---|
| **Edat**(anys) | 60.5±17.4 |
| **Sexe** | 84 (52.8%) homes |
| **Motius de consulta**<br>• Adenopaties perifèriques<br>• Sindrome tòxica<br>• Sospita/masses palpables<br>• Anèmia<br>• Altres | <br>39 (25%)<br><br>24 (15%)<br><br>22 (14%)<br>19 (12%)<br>55 (35%) |
| **Diagnòstics**<br>• Neoplàsies<br><br>*-Tumors sòlids*<br>*-Limfoma*<br>*-Altres neoplàsies hematològiques*<br><br>• Malaties digestives no neoplàsiques<br><br>• Anèmia | <br>41 (26%)<br><br>*29 (71%)*<br>*8 (20%)*<br><br>*4 (10%)*<br><br>18 (11%)<br><br>8 (5%) |
| **Procedència**<br>• Servei d´urgències<br>• Atenció primària<br>• Consultes de l´hospital<br>• Altres | <br>84 (53%)<br>55 (35%)<br>6 (4%)<br>14 (9%) |
| **Temps d´espera primera visita** | 3.6±1.30dies |
| **Temps de diagnòstic** | 12.2±8.71 dies |
| **Destí a l´alta**<br>• Atenció primària | <br>83 (52%) |

| | |
|---|---|
| • Consultes externes hospital<br>• Hospitalització<br>• Serveid´urgències<br>• Altres | 65 (41%)<br>8 (5%)<br>2 (1%)<br>1 (1%) |

## 5.3Objectiu 3. Anàlisi de minimització de costos (AMC) de la UDR

Veure Article 3: Carmen Sanclemente-Ansó[a,*], Xavier Bosch[b], Albert Salazar[c], Ramón Moreno[d],Cristina Capdevila[c], Beatriz Rosón[a], Xavier Corbella[a,e].**Cost-minimization analysis favors outpatient quick diagnosis unit over hospitalization for the diagnosis of potentially serious diseases.** Publicat online en E.J Internal Medicine.Mar 1.

L'actual crisi econòmica s'està revelant com una de les pitjors des de la gran depressió dels anys 20-30, els efectes generals de la crisi son les altes taxes d'atur, l'augment del percentatge de població en risc de pobresa, les altes taxes de morositat, els desnonaments i la demanda de vivenda social; i l'inclement de la taxa de suïcidis i problemes de salut mental.

La pròpia crisi te conseqüències sanitàries com canvis en el patró de risc de malaltia, impacte en grups socials desafavorits, i canvis en la demanda de serveis. A sanitat a nivell europeu, s'ha analitzat l'impacte de la crisi identificant tres tipus d'impacte, impacte en els hospitals i serveis sanitaris, impacte en els professionals i impacte en els pacients i ciutadans. A l'Estat Espanyol s'han adoptat una sèrie de mesures d'ajustament econòmic que han tingut les seves conseqüències sobre el conjunt d'agents del sector sanitari, sobre la indústria farmacèutica, bàsicament per la baixada de preu dels medicaments i l´impacte en la demanda de l'establiment del copagament dels pensionistes, sobre els professionals sanitaris, baixades salarials, increment de la jornada laboral, impuls a la jubilació als 65 anys i reducció de contractes temporals, sobre proveïdors del sistema, amb baixada de concerts i retard en els pagaments, sobre els ciutadans, augment de llistes d'espera, pèrdua de cobertura dels immigrants irregulars i d'altres col·lectius i finalment sobre les inversions, amb disminució del pressupost en totes les comunitats.

Les mesures d'ajust pressupostari poden ser eficaces a curt termini en quant a disminució de la despesa, però negatives a mig i llarg termini per l'estat de salut, però poden tenir un impacte econòmic negatiu sinó és gestionen conjuntament amb la vessant clínica.

Es evident que en el sistema sanitari h ha espai per les retallades sense afectar la qualitat del sistema (lluita amb el malbaratament, desinversions selectives, duplicitat de proves, i procediments redundants, entre d'altres), no tota la reducció de la despesa és justificable; no si les conseqüències a curt, mig i llarg termini no son positives.

En el nostre estudi proposem un dispositiu alternatiu a la hospitalització convencional de baix cost, amb el mateix resultat en el diagnòstic de malalties potencialment greus, aquest dispositiu son les Unitats de Diagnòstic Ràpid (UDR), l'objectiu principal d'aquestes unitats com ja s'ha mencionat és el diagnòstic de malalties potencialment greus en un espai curt de temps, generalment en menys de deu dies.

L'objectiu 3 del treball es comparar el cost d'un ingrés hospitalari versus la UDR pel diagnòstic de tres malalties prevalents com el limfoma, l'anèmia i la neoplàsia de pulmó, que si no existís aquest dispositiu ambulatori, l'estudi s'hauria de fer en una hospitalització convencional.

## Material i mètodes

S'han seleccionat pacients ingressats a l'hospital Universitari de Bellvitge en el servei de Medicina Interna, de forma programada amb el diagnòstic d'alta de limfoma, anèmia i neoplàsia de pulmó, es seleccionen els pacients que ingressen de forma programada per que son pacients que estan al seu domicili esperant per fer el diagnòstic i que les seves condicions clíniques no mostren cap motiu per necessitar

una atenció urgent immediata, que els faria acudir a urgències, es descarten els pacients que ingressen per la porta d'urgències per aquest motiu, així les mostres son comparables, els pacients ingressats i els de la UDR.

Es tracta d'un estudi retrospectiu, des de març de 2008 fins juny de 2012, i es realitza un estudi de minimització de costos, mètode d'avaluació econòmica que s'utilitza quan al comparar dos o més alternatives (terapèutiques, diagnòstiques, preventives), s'obtenen els mateixos resultats d'eficàcia i/o efectivitat, en aquest casos la diferència en termes d'eficiència econòmica de cada opció es basa en el cost que incorpora, la comparació d'aquest cost és el que es denomina anàlisi de minimització de costos.

S'avaluarà el cost econòmic directe de la UDR-HUB (cost de personal: metge i infermera, material sanitari i farmàcia) i costos indirectes imputables d'altres unitats (hostatge, esterilització, neteja, manteniment i administració), així com les despeses estructurals repercutides. El resultat mostrarà les diferències individualitzades per cada diagnòstic en funció de la via d'actuació, també s'avaluarà el cost de les proves complementàries fetes fins arribar a un diagnòstic i analitzant l'estalvi d'ingrés podrem saber el nombre de llits alliberats en el Servei de Medicina Interna o d'altres Serveis de l' HUB.

## Resultats

Avaluats 195 pacients, el cost econòmic per pacient diagnosticat a la UDR, va ser de 976,00 euros pel limfoma, de 652,45 euros per l'anèmia i 1030,78 euros per la neoplàsia de pulmó. El cost per pacient en l'hospitalització convencional va ser de 4481,41 euros pel limfoma, 4422,91 euros per l'anèmia i 4464,13 euros per la neoplàsia de pulmó. La UDR va generar un estalvi només en aquest grup de pacients de 867.719,31 euros. Fig.1,2,3.

El rendiment econòmic de la UDR es clarament superior que l'hospitalització convencional, en els tres diagnòstics prevalents estudiats, el cost en la UDR és molt menor amb igual resultat en el diagnòstic, afegint l'estalvi d'ingressos amb el conseqüent alliberament de llits a l'hospital, podent utilitzar-los per a cirurgia i així disminuir la llista d'espera quirúrgica.

El càlcul del cost d'altres processos estudiats a la UDR també és més baix que si els féssim a altres dispositius assistencials Fig.4.

**Fig. 1. Minimització del cost en una Unitat de diagnòstic Ràpid (UDR) comparativament amb l'hospitalització convencional, en Limfomes, anèmies i neoplàsia de pulmó**

**LINFOMAS**

**n= 63**

| | Hospitalización | | UDR | | Dif. |
|---|---|---|---|---|---|
| | IMPORTE | TOTAL | IMPORTE | TOTAL | IMPORTE |
| **PERSONAL (con cuotas)** | | **199,50** | | **219,05** | **19,56** |
| Personal Facultativo | 135,49 | | 101,74 | | |
| Personal Residente | 54,53 | | 0,00 | | |
| Personal de Enfermería | 0,00 | | 93,00 | | |
| Personal Celador | 0,00 | | 9,99 | | |
| Indirectos de personal | 9,48 | | 14,33 | | |
| **SUMINISTROS** | | **0,00** | | **7,39** | **7,39** |
| Material sanitario | 0,00 | | 6,97 | | |
| Indirectos de suministros | 0,00 | | 0,42 | | |
| **FARMACIA** | | **0,00** | | **0,56** | |
| Medicación | 0,00 | | 0,53 | | |
| Indirectos de farmacia | 0,00 | | 0,03 | | |
| **PRUEBAS COMPLEMENTARIAS** | | **471,83** | | **413,58** | **-58,25** |
| Ver detalle | 471,83 | | 413,58 | | |
| **ESTANCIAS** | | **2.956,41** | | **0,00** | **-2.956,41** |
| Nº estancias | 10,3 | | 0,00 | | |
| Coste estancia (media E071 y E072) | 287,03 | | 0,00 | | |
| **AMORTIZACIÓN** | 15,41 | **15,41** | 15,41 | **15,41** | |
| **SERVICIOS CENTRALES** | | **1.813,87** | | **320,01** | **-1.493,86** |
| (Admisiones, archivo..) | 1.813,87 | | 320,01 | | |
| | | | | | |
| **TOTAL COSTES** | | **5.457,42** | | **976,01** | **-4.481,41** |

| | |
|---|---|
| **Coste evitado (n=63)** | **-282.328,83** |

**Fig.2.**

Bellvitge Hospital Universitari
Institut Català de la Salut

## ANEMIAS

## n= 94

| | Hospitalización | | UDR | | Dif. |
|---|---|---|---|---|---|
| | IMPORTE | TOTAL | IMPORTE | TOTAL | IMPORTE |
| **PERSONAL (con cuotas)** | | **199,50** | | **219,05** | **19,55** |
| Personal Facultativo | 135,49 | | 101,74 | | |
| Personal Residente | 54,53 | | 0,00 | | |
| Personal de Enfermería | 0,00 | | 93,00 | | |
| Personal Celador | 0,00 | | 9,99 | | |
| Indirectos de personal | 9,48 | | 14,33 | | |
| **SUMINISTROS** | | **0,80** | | **7,39** | **6,59** |
| Material sanitario | 0,76 | | 6,97 | | |
| Indirectos de suministros | 0,05 | | 0,42 | | |
| **FARMACIA** | | **1,42** | | **0,56** | |
| Medicación | 1,34 | | 0,53 | | |
| Indirectos de farmacia | 0,08 | | 0,03 | | |
| **PRUEBAS COMPLEMENTARIAS** | | **217,13** | | **197,88** | **-19,25** |
| Ver detalle | 217,13 | | 197,88 | | |
| **ESTANCIAS** | | **2.956,41** | | **0,00** | **-2.956,41** |
| Nº estancias | 10,3 | | 0,00 | | |
| Coste estancia (media E071 y E072) | 287,03 | | 0,00 | | |
| **AMORTIZACIÓN** | 15,41 | **15,41** | 15,41 | **15,41** | |
| **SERVICIOS CENTRALES** | | **1.686,92** | | **212,16** | **-1.474,76** |
| (Admisiones, archivo..) | 1.686,92 | | 212,16 | | |

## Fig.3 NEOPLASIA DE PULMÓN

**n= 38**

| | Hospitalización | | UDR | | Dif. |
|---|---|---|---|---|---|
| | IMPORTE | TOTAL | IMPORTE | TOTAL | IMPORTE |
| **PERSONAL (con cuotas)** | | **199,50** | | **219,05** | **19,56** |
| Personal Facultativo | 135,49 | | 101,74 | | |
| Personal Residente | 54,53 | | 0,00 | | |
| Personal de Enfermería | 0,00 | | 93,00 | | |
| Personal Celador | 0,00 | | 9,99 | | |
| Indirectos de personal | 9,48 | | 14,33 | | |
| **SUMINISTROS** | | **0,00** | | **7,39** | **7,39** |
| Material sanitario | 0,00 | | 6,97 | | |
| Indirectos de suministros | 0,00 | | 0,42 | | |
| **FARMACIA** | | **0,00** | | **0,56** | |
| Medicación | 1,34 | | 0,53 | | |
| Indirectos de farmacia | 0,08 | | 0,03 | | |
| **PRUEBAS COMPLEMENTARIAS** | | **496,83** | | **450,10** | **-46,73** |
| Ver detalle | 472,30 | | 438,58 | | |
| **ESTANCIAS** | | **2.956,41** | | **0,00** | **-2.956,41** |
| Nº estancias | 10,3 | | 0,00 | | |
| Coste estancia (media E071 y E072) | 287,03 | | 0,00 | | |
| **AMORTIZACIÓN** | 15,41 | **15,41** | 15,41 | **15,41** | |
| **SERVICIOS CENTRALES** | | **1.826,77** | | **338,27** | **-1.488,50** |
| (Admisiones, archivo..) | 1.826,37 | | 338,27 | | |
| | | | | | |
| **TOTAL COSTES** | | **5.494,92** | | **1.030,79** | **-4.464,69** |

| | |
|---|---|
| **Coste evitado (n=38)** | **-169.636,94** |

**Fig.4.Taula cost per grup diagnòstic**

MotiuConsulta 13

| grup diagnòstic | descripció grup diagnòstic | Valores Suma de Total import | Cuenta de N.HªClínica | Cost mig |
|---|---|---|---|---|
| 1 | Cancer Sòlid | 24.696,01 | 42 | 588,00 |
| 2 | Limfoma | 34.321,86 | 49 | 700,45 |
| 3 | Otros hematologicos | 1.453,99 | 3 | 484,66 |
| 4 | Anomia | 1.189,99 | 2 | 595,00 |
| 5 | Adenitis inespecifica | 41.877,45 | 91 | 460,19 |
| 6 | Enfermedades tiroideas | 6.169,65 | 14 | 440,69 |
| 7 | Enfermedades reumatologicas | 1.769,30 | 2 | 884,65 |
| 8 | No enfermedad aguda | 8.294,97 | 22 | 377,04 |
| 9 | Enfermedades respiratorias | 909,33 | 2 | 454,67 |
| 10 | enfermedades infecciosas | 7.316,82 | 15 | 487,79 |
| 11 | otras | 19.936,76 | 46 | 433,41 |
| 12 | Enfermedades digestivas | 1.296,97 | 3 | 412,32 |
| Total general | | 149.173,10 | 291 | 512,62 |

Tenint el compte el cost de l'hospitalització , es pot entendre que qualsevol procés fet de forma ambulatòria és te un cost inferior, així ho mostra l'anterior taula, serà important en un futur quan es posi en marxa el nou sistema de pagament, aconseguir que aquest tipus de dispositiu es catalogui com d'alta complexitat, per fer una correcta facturació en centres com els de la XHUP, en centres com l´ICS al anar a pressupost aquest dispositiu és altament beneficiós.

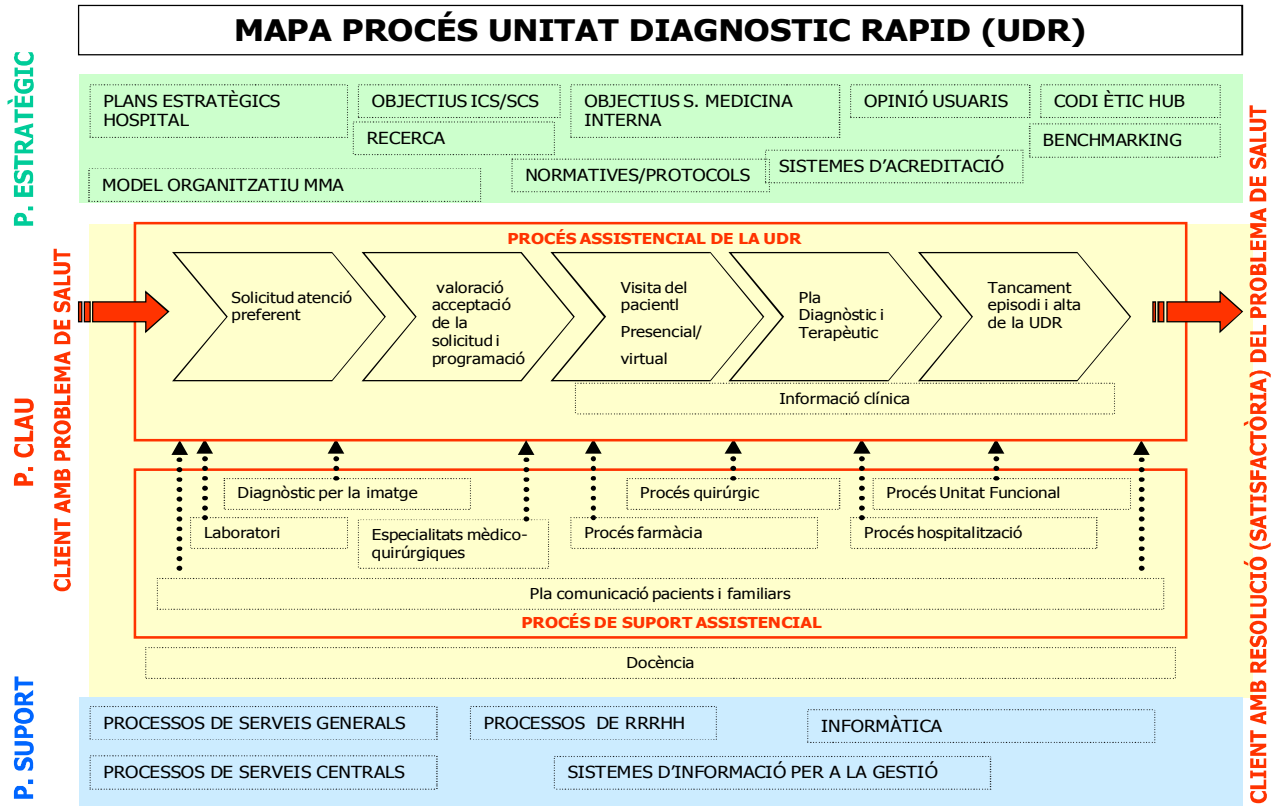
## 5.4. Mapa de procés

El mapa de procés de la UDR Fig. 4. mostra l'atenció per processos des de que el pacient entra en el circuit assistencial amb tots els implicats en el desenvolupament dels mateixos, amb el continnum assistencial en el procés clau , que és el client amb un problema de salut fins arribar al client amb resolució del problema de salut de forma satisfactòria Mostra de forma molt visual tot el procés d'atenció.

Està format pel **procés estratègic** que segueix el pla estratègic de l´hospital, els objectius de l´ICS en el nostre cas, els objectius de Medicina Interna a la que pertany

la Unitat, el codi ètic de l'hospital, amb un pla que desenvolupa el model organitzatiu de la Medicina Major Ambulatòria (MMA), seguint sempre totes les normatives i protocols, passant recentment l'acreditació amb una puntuació molt alta i fent sempre benchmarking.

**Fig.4.**



**El procés clau** mostra part de l'atenció que rep el client, des de que arriba a la porta d'entrada fins que acaba el seu problema implicat aquí tot el procés de suport assistencial que engloba serveis centrals com el diagnòstic per la imatge, laboratori, farmàcia i a totes les especialitats mèdic- quirúrgiques i d'altres dispositius com l'hospitalització i les unitats funcionals.

**El procés de suport** son aquells serveis centrals com informàtica, recursos humans, serveis generals com la cuina i tota la hoteleria i neteja, entre d'altres i tots els sistemes d'informació.

És molt important el funcionament per processos i es pot veure que amb la integració de tots aquests recursos a la UDR, s'aconsegueix una atenció continua del client/pacient amb resolució del problema i satisfacció de l'usuari i professional.

# 6. CONCLUSIONS FINALS DE LA UDR

- **Accessibilitat:** la UDR ofereix una gran accessibilitat per part dels professionals tant del nostre hospital com de l'atenció primària gràcies a les múltiples vies d'accés (sistema informàtic de l'hospital (SAP), telèfon directe, e- mail, FAX), amb uns criteris molt ben definits i dels quals s'ha fet una amplia difusió, i per part dels pacients amb fàcil accés a les instal·lacions, i amb un telèfon de contacte directe durant tot el procés diagnòstic.

- **Resolució:**La UDR ofereix una assistència ràpida i segura ( pocs ingressos hospitalaris, poques visites a urgències durant el procés diagnòstic, poques complicacions) als pacients amb malalties potencialment greus, sense llista

d'espera per una primera visita, el temps diagnòstic des de la primera visita es menor a 10 complint les expectatives d'atenció i qualitat. La satisfacció dels pacients és molt elevada i prefereixen aquest dispositiu a l'hospitalització convencional.

- **Recursos i Cost:** La UDR aporta un estalvi d'ingressos hospitalaris en un percentatge molt elevat, podent aprofitar els llits mèdics alliberats per fer procediments quirúrgics i així disminuir la llista d'espera. La UDR aporta un estalvi econòmic molt important , pel seu baix cost per diagnòstic i d'estructura, amb igual resultat en el diagnòstic final , essent un dispositiu assistencial aplicable a qualsevol hospital de qualsevol nivell assistencial.

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# Annex 1.

# CRITERIS DE DERIVACIO *UDR* MEDICINA INTERNA

**Símptomes indefinits**

- **Adenopatia sense causa justificada:**
  - no reactiva
  -de dies d'evolució
  -que no cedeixi amb AINEs
  -acompanyada d'altre signe
- **Sospita de tumoracions;** (excepte, pulmó, mama,via excretora renal, cap i coll,palpació massa rectal, rectorràgies o sospita N. Colon ).Son patologies que tenen circuit ràpid propi dintre de l´HUB.
- **Síndrome tòxica confirmada** o acompanyada de:
  - *disfagia .....intentar sol·licitar FEGD/Trànsit EGD*
  - *Canvi de ritme deposicional >1m sense causa coneguda, igualment es pot sol·licitar colonoscòpia.*
  - *Anèmia ferropènica amb alta sospita de neoplàsia digestiva.*

  **(la resta d´ anèmies ferropèniques s'han d'estudiar a l'ambulatori)**

- **Síndrome febril perllongat** (FOD >1m): demanar des del servei de urgències cies si hi ha possibilitat
  -BQ, hemograma, serologies, immunologia
  -Ecografia abdominal
- **Alteracions del hemograma (anèmies NN, macrocitiques de nova aparició/banda monoclonal descartades causes farmacològiques o tòxiques.**
- **Ascites en pacients no cirròtics**
- **Hepato-esplenomegalia-Alteració funció hepàtica o colòstasis no justificada**
- **Icterícia no obstructiva**
- **Massa abdominal**
- **M1 sense primari estudiat**

**El dolor abdominal per si sol no és un criteri vàlid per derivar al pacient a la UDR**

**Annex.2**.

# Unitat de diagnòstic ràpid

☐ Edat Sexe: ☐ home ☐ dona Núm registre_____

## Dades personals del pacient

Num H.C. Cognons i nom

Adreça

Població C.P.

Telèfon Telèfon 2

## Entrada al circuit UDR

Procedència/Origen ☐ Ucies ☐ CCEE ☐ AP ☐ Altres

Petició ☐ SAP ☐ e- mail ☐ paper ☐ Telèfon

Metge/sa Num col·legiat_____

Àrea Básica(ABS) Codi ABS ☐

Motiu de Consulta *codi ☐

*1-Sd febril,2-Sd. Tóxica,3-Foc Neurològica,4-Alt Radiològica,5-Diarrea,6-Anemia,
7-Hemoptisi,8-Ictericia,9-V. Pleural,10-Dolor Ossi,11-Dolor toràcic,12-Lesions cutànies,13-Adenopatíes,14-Artritis/artralgies,15-cefalea,16-D. Abdominal,17-HDA,
18-Hep Aguda/crònica,19-Tumuracions,20-Sincop,21-Hipertiroidisme,
22-Rectorràgies,23-Edemes,24-Disfagia/odinofagia,25-Debilitat muscular/mialgies,26-Ascites,27-Patró intersticial pulm,28-Sosp.M.Sistèmica,29-Dispnea,30-Inflamació, 40-restrenyiment 31-altres

Compleix Criteris d´inclusió d´acord al protocol? Si No Motiu_____

## Seguiment, Exploracions i visites

| Data d´origen de la sol·licitud 1ª visita | Data d´arribada de la sol·licitud a l´UDR | Data de la 1ª Visita | Data 1ª successiva | Data del diagnòstic | Data d´alta |
|---|---|---|---|---|---|
| | | | | | |

Dates d´altres Successives

| | |
|---|---|
| | |
| | |

*Destí a l'alta ☐

*1-Domicili,2-A.Primària,3-CCEE,4-ucies,5-Ingrés H,6-Altres

Motiu de derivació a ucies o ingrés hospitalari

Centre de derivació

| | Núm. | Data sol. | Data realització | | Núm. | Data sol. | Data realització |
|---|---|---|---|---|---|---|---|
| Analítica | | | | Eco doppl | | | |
| Serologies | | | | TAC | | | |
| | | | | TAC+ biopsia | | | |
| Cultius | | | | PET | | | |
| IndexCharlsonPV | | | | IndClarlson VS | | | |
| Citologies PAAF | | | | Gangli | | | |
| Cito de Fluxe | | | | PCR tbc | | | |
| Biòpsies | | | | Gastroscopia | | | |
| Rx simples | | | | Colonoscopia | | | |
| TEGD | | | | Broncoscopio | | | |
| E. Opaca | | | | PFR | | | |
| Ecografies | | | | Ecocardio | | | |
| Ecografia+ biopsia | | | | | | | |
| Eco Ginecològ | | | | Prova esforç | | | |
| RMN | | | | Holter ECG | | | |
| AMO | | | | EMG | | | |
| Biòpsia M.O | | | | ECG | | | |
| PPD | | | | Interconsulta | | | |
| Gammagrafia | | | | Altres | | | |
| Mamografia | | | | Toracocentesis | | | |
| | | | | Paracentesis | | | |

Diagnòstic a l'alta- 1_____ Codi IDC 9 _____

2_____

Estalvi d´ingrés Si No Grup dx* ☐

*1-Neoplàsies,2-Infeccions,3-Neurologia,4-Pneumologia,5-Reumatologia,6-Digestologia,7-Endocrí,8-Psiquiatria,9-cardiovascular,10-Hematologia,11-Nefrologia,12-Altres,13-No realitzat.

Adequat Si No

Tipus de diagnòstic * ☐

* 11-AP,12-Imatge,13-Conjunt clínica/analísi/Imatge,14-Microbiològic,15-Endoscòpic,16-laboratori, 20- Clínic17-Altres

☐ 1- Etiològic ☐ 2-Exclusió ☐ 3-Probable ☐ 4-No completat

Confirmació Patològica ☐ SI ☐ No Data confirmació AP ☐

TNM ☐

Tipus de tractament Mèdic ☐ Quirúrgic ☐ Data inici tractament ☐

## Intervals de temps en procés d´UDR

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Des de la data de recepció fins a la 1ª visita | | Fins identificació Diagnòstic | | Fins a l´alta | | Inici de tractament des de 1ª visita | | Desde data d'origen fins data d´alta | |

# Annex. 3.

**Encuesta de satisfacción realizada a los pacientes atendidos en la Unidad de Diagnóstico Rápido (UDR)**

**1 Servicio de Medicina Interna**

Fecha de consulta: _/_/_ sexo: H M SAP:

Su opinión nos hará mejorar.Por favor rellene este cuestionario anónimo marcando con una cruz la opinión que crea mejor se corresponde con su punto de vista.

1- Edad:

2- Estudios: Sin estudios EGB Bachiller superior /FP Universitarios

3- ¿Ha estado en otra consulta de otro hospital? Sí No

4- ¿Ha encontrado sin dificultad la consulta? Sí No

5- ¿Conoce el nombre del médico que lo ha atendido? Sí No

6- ¿Conoce el nombre de la enfermera que lo ha atendido? Sí No

7- El tiempo de espera para la primera visita le ha parecido:

Muy escaso Escaso Correcto Excesivo Muyexcesivo

8- El personal sanitario lo atendió con amambilidad:

Nunca Pocas veces Casi siempre Siempre No procede

9-El personal sanitario hizo lo posible por ayudarle cuando lo necesitó en la consulta:

Nunca Pocas veces Casi siempre Siempre No procede

10-Durante su consulta, ¿cómo fue?:

| | Mucho peor de lo que esperaba | Peor de lo que esperaba | Como lo esperaba | Mejor de lo que me esperaba |
|---|---|---|---|---|
| La duración De la consulta | ☐ | ☐ | ☐ | ☐ |
| La temperatura De la consulta | ☐ | ☐ | ☐ | ☐ |
| El ruido de la Sala de espera | ☐ | ☐ | ☐ | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| La limpieza de La consulta | ☐ | ☐ | ☐ | ☐ | ☐ |

11-¿Obtuvo información clara sobre los siguientes aspectos?

| | Nunca | Pocas veces | Casi siempre | Siempre | No procede |
|---|---|---|---|---|---|
| En que consístia Su enfermedad | ☐ | ☐ | ☐ | ☐ | ☐ |
| Las pruebas que Le realizaron | ☐ | ☐ | ☐ | ☐ | ☐ |
| Riesgos del diagnóstico y del tratamiento | ☐ | ☐ | ☐ | ☐ | ☐ |
| Instrucciones a seguir tras el alta | ☐ | ☐ | ☐ | ☐ | ☐ |

12-El tiempo transcurrido hasta el diagnóstico de su enfermedad le ha parecido:

Muy escaso Escaso Correcto Excesivo Muy excesivo

13-Ha tenido algun problema con:

| | | | |
|---|---|---|---|
| Acogida/trato en el servicio | Sí | No | Cuál: |
| Diagnóstico de su enfermedad | Sí | No | Cuál: |
| Tratamiento recibido | Sí | No | Cuál: |
| Información recibida | Sí | No | Cuál: |

14-¿ Le ha resultado incómodo desplazarse para las pruebas y visitas repetidas al hospital y a la consulta?

15- ¿Hubiera preferido haber hecho el estudio de su enfermedad ingresado?

16- ¿Recomendaría a un familiar, si lo necesitara esta consulta de Medicina Interna?

Nunca 0 1 2 3 4 5 6 7 8 9 10 Sin dudarlo

17-¿ sabe de qué lo han diagnosticado? Sí No _____

18- Escriba por favor su diagnóstico ----------

19-¿Qué podemos hacer mejor?

20- Ha estado ingresado alguna vez en el hospital si no

# 8. Articles

Article 1: Sanclemente-Ansó C, Salazar A, Bosch X, Capdevila C, Vallano A, Català I, Fernandez-Alarza AF, Rosón B, Corbella X. **A quick diagnosis unit as an alternative to conventional hospitalization in a tertiary public hospital: a descriptive study. Pol ArchMedWewn. 2013; 123(11):582-8.**

Article 2: Carmen Sanclemente-Ansó, Albert Salazar, Xavier Bosch, Cristina Capdevila, Amparo Giménez-Requena, Beatriz Rosón-Hernández, and Xavier Corbella. **Perception of quality of care of patients with potentially severe diseases evaluated at a distinct quick diagnostic delivery model: a cross-sectional study BMC Health Serv Res. 2015; 15: 434.**

Article 3: Carmen Sanclemente-Ansó[a,*], Xavier Bosch[b], Albert Salazar[c], Ramón Moreno[d], Cristina Capdevila[c], Beatriz Rosón[a], Xavier Corbella[a,e].**Cost-minimization analysis favors outpatient quick diagnosis unit over hospitalization for the diagnosis of potentially serious diseases.** Publicat online en E.J Internal Medicine.Mar 1.

**Article 1:** Sanclemente-Ansó C, Salazar A, Bosch X, Capdevila C, Vallano A, Català I, Fernandez-Alarza AF, Rosón B, Corbella X. **A quick diagnosis unit as an alternative to conventional hospitalization in a tertiary public hospital: a descriptive study. Pol ArchMedWewn. 2013; 123(11):582-8.**

ORIGINAL ARTICLE

# A quick diagnosis unit as an alternative to conventional hospitalization in a tertiary public hospital: a descriptive study

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**KEY WORDS**

anemia, cancer, hospitalization, quick diagnosis units, referral

**ABSTRACT**

**INTRODUCTION** Reports indicate that a significant number of patients admitted to internal medicine units could be studied on an outpatient basis.

**OBJECTIVES** This article assesses a quick diagnosis unit (QDU) as an alternative to acute hospitalization for the diagnostic study of patients with potentially serious diseases and suspected malignancy.

**PATIENTS AND METHODS** Between March 2008 and June 2012, 1226 patients were attended by the QDU. Patients were referred from the emergency department, primary health care centers, and outpatient clinics according to well-defined criteria. Clinical information was prospectively registered in a database.

**RESULTS** There were 634 men (51.7%), with a mean age of 60.5 ±17.5 years. The mean time to the first visit was 3.5 ±5.3 days. Most patients (65.7%) required only 2 visits. The mean interval to diagnosis was 12.2 ±14.7 days. A total of 324 patients (26.4%) had cancer. The diagnosis was a solid tumor in 81.5% of the cases, lymphoma in 19.8%, and various hematologic malignancies in 4.3%. The second most common diagnosis was anemia not associated with cancer (8.6% of the cases). Admission to the QDU allowed to avoid conventional hospitalization for diagnostic studies in 71.5% of the patients, representing a mean freeing-up rate of 7 internal medicine beds per day. In a satisfaction survey, 97% of the patients were completely or very satisfied and 96% preferred the QDU to conventional hospitalization.

**CONCLUSIONS** A QDU may be a feasible alternative to conventional hospitalization for the diagnosis of otherwise healthy patients with suspected severe disease. Appropriately managed and supported, QDUs can lighten the burden of emergency departments and reduce the need for hospitals beds.

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**INTRODUCTION** Inappropriate hospitalization is a significant economic problem in Spain and other countries with public health care systems owing to the high cost of conventional hospitalization. Various Spanish reports suggest that, according to the Appropriateness Evaluation Protocol (AEP), from 9.4% to 16% of the patients admitted to internal medicine units could be studied on an outpatient basis.[1-4] Inappropriate hospitalization may exceed 25% in the United Kingdom,[5,6] 31% to 34% in the United States, 18% in Israel, and 15% in Switzerland.[2] However, diagnosis without conventional hospitalization, including patients in whom severe disease is suspected, may not be practical, owing to factors such as long waiting times, overcrowding in primary

**TABLE 1** Criteria for referral to quick diagnosis unit

| Adenopathies |
|---|
| anemia, with or without symptoms (hemoglobin level <9 g/l) |
| unintentional weight loss (loss of >10% of body weight during >6 weeks) |
| unexplained febrile syndrome (temperature >38°C; >2 weeks) |
| unexplained dysphagia |
| unexplained persistent severe abdominal pain |
| suspected tumor |
| persistent change in bowel rhythm (>1 month) |
| ascites in noncirrhotic patients |
| lung and or pleural radiologic abnormalities |
| hepatosplenomegaly |
| changes in liver function |
| nonobstructive jaundice |
| abdominal mass |
| metastatic cancer of unknown origin |

health care centers (PHCs), and the lack of coordination between PHCs and hospitals.[6,7] Consequently, those patients, even those in good health, are hospitalized for diagnostic tests, aggravating overcrowding and increasing costs[8]; in a Spanish report, this was the cause of 9.4% of inappropriate hospitalizations in a public internal medicine department.[2]

Given that the current economic crisis has led to austerity in health policies, with severe restrictions on public health care,[9] avoiding unnecessary admissions and shortening hospital stays is becoming an urgent priority. The increasing cost of hospitalization means that it is a good moment to foster alternatives to conventional hospitalization, including, among others, day centers, hospital at home, noninvasive home telemonitoring, and quick diagnosis units (QDUs).[9,10] Although reports are sparse, there is increasing evidence that more agile and better coordinated internal medicine QDUs are a potentially cost-saving alternative to acute hospitalization for the diagnostic study of patients with suspected malignancy, allowing the majority of patients to continue with daily life during the diagnostic process, thus increasing their comfort.[7] To date, only 1 English-language report describing a QDU of a Spanish tertiary hospital has been published.[11]

This article assesses the functioning of an internal medicine QDU in a public university hospital during a period of 4.5 years.

**PATIENTS AND METHODS** Our QDU is integrated in the Internal Medicine Department of the Bellvitge University Hospital, Barcelona, Spain, a tertiary public hospital with 906 acute beds serving a reference population of 343,172. The hospital is a referral center for more than 2 million people for processes requiring high technology and is equipped with all medical and surgical specialties except obstetrics and pediatrics. The QDU assesses patients with suspected serious conditions who are physically and mentally able to attend various appointments and who accept the referral. The unit comprises an internal medicine specialist and a nurse, who work for 7 hours a day, 2 days a week. Support is received through coordinated assistance from other specialists. The QDU has a consulting room and a waiting room for patients and families.

Between 28 March 2008 and 30 June 2012, 1226 patients were attended by the QDU. Patients were referred from the emergency department (ED), PHCs, and outpatient clinics. The referral criteria were similar to those previously established in other Spanish QDUs (TABLE 1).[7,12] Referrals to the QDU were made by the hospital computer system, phone calls, or e-mail. The appropriateness of the referral was determined by a QDU specialist.

The care protocol consists of an urgent first visit followed by preferential programming of complementary tests and subsequent visits until a diagnosis is made. In addition to the complementary tests typical of a tertiary such as magnetic resonance imaging, scintigraphy, and (F-18 fluorodeoxyglucose [FDG]) positron emission tomography–computed tomography (PET-CT) scans, there is a dedicated circuit for the evaluation of lymphadenopathy. In the case of suspected malignant adenomegaly, fine needle puncture aspiration (FNPA) is performed with cytology studies available in 30 minutes and, since November 2011, flow cytometry is available for the diagnosis of some lymphomas.

Clinical information was prospectively registered in a database. For every patient, we recorded demographic data, reason for consultation, source of referral and appropriateness of the visit, waiting time to the first visit, number of visits, type, number and dates of complementary tests, diagnosis, time to diagnosis, and destination. The appropriateness of the referral was considered correct when the patient had one of the previously established reasons for consultation (TABLE 1). Delay or time to the first visit was defined as the time from the medical referral to the first patient visit at the QDU. The diagnostic interval was defined as the time from the first visit to the definitive diagnosis, which usually coincides with the result of a complementary diagnostic test, even when histological confirmation remains pending.

We calculated the proportion of QDU patients who might have been hospitalized in the absence of the QDU, taking into account avoidable or inappropriate hospitalizations in internal medicine departments of Spanish hospitals according to several Spanish studies using the AEP,[1,2,4,13] and estimated the daily beds freed up by these patients. For this, we calculated the total study period (51 months), the total number of internal medicine beds (n = 36), and the mean length-of-stay of patients with conditions that could be diagnosed in the QDU who were studied in-hospital before the creation of the QDU (mean length-of-stay, 12 days).

TABLE 2 Clinical parameters of a quick diagnosis unit during the years 2008–2012

| Year | First visits, n | Successive visits, n (successive/first visit ratio) | Source of referral, n (%) | | | Time to first visit, d (mean ±SD) | Time to diagnosis, d (mean ±SD) | Onward referral, n (%) | | | Appropriateness criteria, n (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ED | PHC | outpatient clinics | | | ED | PHC | outpatient clinics | admission | |
| 2008 | 290 | 163 (0.56) | 204 (70.3) | 80 (27.6) | 6 (2.1) | 9.4 ±7.4 | 9.5 ±11.2 | 4 (1.4) | 182 (62.8) | 84 (29) | 20 (6.9) | 210 (72.5) |
| 2009 | 272 | 157 (0.57) | 134 (49.3) | 136 (50) | 2 (0.7) | 3.0 ±3.5 | 11.9 ±14.5 | 3 (1.1) | 119 (43.7) | 135 (49.6) | 15 (5.5) | 246 (90.6) |
| 2010 | 252 | 192 (0.76) | 111 (44.1) | 133 (52.7) | 8 (3.2) | 1.9 ±2.0 | 16.8 ±18.6 | 4 (1.6) | 138 (54.7) | 99 (39.3) | 11 (4.4) | 239 (94.3) |
| 2011 | 266 | 220 (0.82) | 131 (49.2) | 127 (47.7) | 8 (3.1) | 1.0 ±1.1 | 13.8 ±15.4 | 0 | 133 (50) | 120 (45.1) | 13 (4.9) | 252 (94.7) |
| 2012 (6 mo) | 146 | 111 (0.78) | 68 (46.6) | 59 (40.4) | 19 (13.0) | 0.3 ±0.7 | 6.9 ±8.7 | 0 | 71 (48.6) | 69 (48.6) | 6 (4.1) | 137 (93.8) |
| total | 1226 | 861 (0.70) | 648 (52.9) | 535 (43.6) | 43 (3.5) | 3.5 ±5.3 | 12.2 ±14.7 | 11 (0.9) | 643 (52.4) | 507 (41.3) | 65 (5.3) | 1094 (89.2) |

Abbreviations: ED – emergency department, PHC – primary health care center, SD – standard deviation

We also carried out a satisfaction survey of consecutive QDU patients seen between 6 March 2012 and 7 December 2012. The survey was administered at discharge from the QDU. Patients were invited to complete in writing an anonymous opinion survey adapted from that used by the Colombian Urologists Association.[14] This survey was chosen as it has been used to evaluate surgical and medical outpatients' satisfaction in other Spanish public health centers.[15] It consists of 20 questions and assesses the level of satisfaction in relation to different items such as the physical characteristics of the unit, the personal and medical care received, and the time to diagnosis. The survey was approved by the ethics committee of the Bellvitge University Hospital and was validated internally by the hospital quality service.

**Statistical analysis** For each year and for the whole study period, we calculated the following descriptive variables: 1) the number of patients studied and the frequency distribution by age and sex, area of origin, reason for consultation, diagnosis and discharge destination; 2) the mean waiting time to the first visit and the mean diagnostic interval; 3) the frequency of patients who met the QDU appropriateness criteria; and 4) the frequency of patients who avoided hospitalization. Differences were contrasted using the Fisher's $\chi^2$ test for categorical variables and the Student's *t* test when homogeneity of variance was met, or the Mann–Whitney *U* test for quantitative variables. Statistical significance was established as a *P* value of 0.05, and the analysis was made using the SPSS 20.0 statistical package.

## RESULTS

During the study period, 1226 patients were evaluated, of whom 634 (51.7%) were male, with a mean age of 60.5 ±17.5 years (range, 16–102 years). The 1226 first visits generated 861 successive visits (successive-to-first visit ratio, 0.70). Most patients (n = 806, 65.7%) required only 2 visits.

TABLE 2 shows the number of patients seen, their origin, time to the first visit, and time to diagnosis for each of the years studied. A total of 52.9% of the patients were referred from the ED, 43.6% from PHCs, and 3.5% from hospital outpatient clinics; 1094 patients (89.2%) met the criteria for adequate pre-established indication for referral to the QDU and the remaining 10.8% did not meet those criteria. More patients from PHCs (n = 463, 86.5%) and hospital outpatient clinics (n = 37, 86%) fulfilled the referral appropriateness criteria compared with those from the ED (n = 517, 79.8%).

The mean time to the first visit was 3.5 ±5.3 days. The mean interval to diagnosis was 12.2 ±14.7 days.

TABLE 3 shows the most common reasons for consultation. The 6 main reasons (80.5%) were persistent lymphadenopathy in 297 cases (24.2%), involuntary weight loss in 187 (15.3%), tumors

**TABLE 3** Main reasons for consultation

| Reasons for consultation | n (%) |
|---|---|
| adenopathies | 297 (24.2) |
| involuntary weight loss | 187 (15.3) |
| suspected tumor | 169 (13.8) |
| anemia | 154 (12.6) |
| abdominal pain | 106 (8.6) |
| lung / pleural radiological abnormalities | 74 (6.0) |
| changes in bowel rhythm / chronic diarrhea | 36 (2.9) |
| rheumatic / bone pain | 23 (1.9) |
| pleural effusion | 15 (1.2) |
| febrile syndrome | 14 (1.1) |
| nonobstructive jaundice | 14 (1.1) |

**TABLE 4** Main complementary tests

| Complementary tests | n (%) |
|---|---|
| blood tests | 714 (58.3) |
| simple radiography | 249 (20.3) |
| cytology/FNPA | 297 (24.1) |
| abdominal ultrasonography | 293 (23.9) |
| computed tomography | 281 (23.6) |
| colonoscopy | 194 (15.8) |
| upper digestive endoscopy | 184 (15.0) |
| biopsy | 120 (9.9) |
| body (F-18 FDG) PET/CT scan | 115 (9.4) |
| electrocardiography | 108 (8.8) |
| upper gastrointestinal series | 44 (3.6) |
| barium enema | 61 (5.0) |
| bone nuclear scintigraphy | 41 (3.3) |
| bone marrow aspiration | 32 (2.6) |
| gynecological ultrasonography | 26 (2.2) |
| blood / urine / bronchial secretion culture | 39 (3.2) |
| magnetic resonance imaging | 28 (2.3) |
| fiberoptic bronchoscopy | 15 (1.2) |
| mammography | 13 (1.1) |
| serology | 29 (2.4) |
| tuberculin test | 10 (0.8) |
| flow cytometry | 9 (0.7) |
| Doppler echocardiography | 9 (0.7) |
| bone marrow biopsy | 5 (0.4) |
| pulmonary function testing | 3 (0.2) |
| electromyography | 3 (0.24) |
| Holter monitoring | 2 (0.2) |

Abbreviations: FDG – fluorodeoxyglucose, FNPA – fine needle puncture aspiration, PET-CT – positron emission tomography–computed tomography

suspected of malignancy in 169 (13.8%), anemia in 154 (12.6%), abdominal pain in 106 (8.6%), and pleuro-pulmonary radiological abnormalities in 74 (6%).

TABLE 4 shows the main complementary tests that were conducted. There were a mean of 2.5 ±1.7 additional examinations per patient. No complementary tests were performed in 192 patients (15.6%). Tests included 297 cytologies and, among them, 9 flow cytometries.

Body (F-18 FDG) PET/CT scans were performed in 115 patients; the most frequent reasons were lymphadenopathy in 37 cases (32.2%), involuntary weight loss without symptoms indicative of a causal process in 35 (30.4%), tumors in 19 (16.5%), and radiographic abnormalities suggestive of lung cancer in 8 (7%).

An etiological diagnosis was obtained in 926 patients (75.5%), a diagnosis of exclusion in 243 (19.8%), a probable diagnosis in 13 (1.1%), and the diagnostic process was not completed in 44 (3.6%).

TABLE 5 shows the most common final diagnoses. A total of 324 patients (26.4%) had cancer: cytological or pathological confirmation of the diagnosis was obtained in 92.1% of the patients. The diagnosis was a solid tumor in 264 cases (81.5%), lymphoma in 64 (19.8%), and various forms of hematologic malignancy in 14 (4.3%). The most common solid tumors were digestive in 123 patients (46.6%), lung in 35 (13.3%), head and neck in 25 (9.5%), gynecological in 26 (9.8%), and nephro-urological in 24 (9.1%) (TABLE 6).

An FNPA study confirmed the diagnosis of lymphoma in 64 cases and showed nonspecific reactive adenitis in 91 cases. In 11 cases, FNPA study confirmed nodal tuberculosis as the only manifestation of tuberculosis with microbiological confirmation in all cases.

The second most common diagnosis was anemia not associated with cancer in 106 cases (8.6%); this was due to iron deficiency in 73 cases, vitamin $B_{12}$ deficiency in 12, multiple factors in 11, postoperative bleeding in 4, and unknown causes in 6 cases.

After completion of the diagnostic study, 647 patients (52.8%) were referred to their PHC physician and 503 (41%) to hospital outpatient clinics. Owing to their poor condition, 11 patients (0.9%) were sent to the ED and 65 (5.3%) required admission owing to complications in the diagnostic process or worsening general condition that did not allow to continue the outpatient studies.

The QDU allowed to avoid conventional hospitalization for diagnostic studies in 870 patients (71.5%), representing a mean freeing-up rate of 7 internal medicine beds per day.

Of 162 patients, 159 (98.1%) responded to the satisfaction survey. On a 1–10 analogue scale, satisfaction was rated as 10 by 129 patients (81.1%), 8–9 by 25 (15.7%), 7 by 4 (2.5%), and 5 by 1 patient (0.6%). No patient scored below 5. When asked whether they preferred the QDU or assessment by conventional hospitalization for the study of their disease, 96.2% of the patients said they preferred the QDU.

**DISCUSSION** During the study period, 1226 patients were evaluated, generating 861 successive visits. The annual number of patients did not vary significantly throughout the study period.

**TABLE 5** Most common diagnoses in patients admitted to a quick diagnosis unit

| Diagnosis | n (%) |
|---|---|
| malignant neoplasm | 324 (26.4) |
| solid tumors | 246 (75.9) |
| lymphoma | 64 (19.8) |
| other hematological tumors | 14 (4.3) |
| anemia (unrelated to malignancy) | 106 (8.6) |
| reactive adenitis | 91 (7.4) |
| digestive disorders | 91 (7.4) |
| thyroid diseases | 38 (3.1) |
| rheumatological disorders | 33 (2.7) |
| cardiorespiratory disorders | 28 (2.3) |

**TABLE 6** Description of solid tumors

| Solid tumors | 264, n (%) |
|---|---|
| digestive | 123 (46.6) |
| colon | 45 (36.6) |
| bilio-pancreatic | 36 (29.3) |
| gastric | 23 (18.7) |
| liver | 10 (8.1) |
| esophageal | 9 (7.3) |
| head and neck | 25 (9.5) |
| ear, nose, and throat | 14 (56) |
| parotid gland | 6 (24) |
| thyroid | 5 (20) |
| lung | 35 (13.3) |
| nephro-urologic | 24 (9.1) |
| prostate | 9 (37.5) |
| kidney | 11 (45.8) |
| bladder | 4 (16.6) |
| gynecologic | 26 (9.8) |
| cancer of unknown origin | 11 (4.2) |
| bone and soft tissue tumors | 6 (2.3) |
| melanoma | 4 (1.5) |
| brain tumors | 3 (1.1) |
| other tumors | 7 (2.7) |

Appropriate referral of patients to the QDU is critical to its effectiveness. The typical profile was a patient with a potentially serious disease but with general good health that allowed a study on an outpatient basis.[11,16] In our study, 89.2% of the patients referred to the QDU met the pre-established referral criteria, which is slightly higher than the rate reported by other QDUs in our setting.[8,12] The remaining 10.8% of the patients who did not meet those criteria should probably have been evaluated by other health care modalities such as family physicians or specific multidisciplinary functional units (e.g., lung or breast units). If the first year of operation of the QDU, which could be considered a year of adaptation, is excluded from the analysis, the percentage rises to 93.3%.

Fewer patients from the ED (79.8%) fulfilled the referral appropriateness criteria than those from PHCs (86.5%) and hospital outpatient clinics (86%). This might be explained by the rapid turnover in ED residents and the fact that some of them make decisions, including referral decisions, on their own, and may not be sufficiently well-informed of the referral criteria.

Most patients were referred from the ED (51.9%) and PHCs (43.7%). During the first year of operation, referrals from the ED were very high (70.5%) and from PHCs very low (27.6%), but later those figures reached almost 50%. This is almost certainly owing to the initial period of introduction and adaptation of the QDU.

The mean time to the first visit was 3.5 days. The time was reduced from 9.4 days in 2008 to 2.3 days in 2012, undoubtedly owing to better selection of patients with previously agreed referral criteria. The mean interval to diagnosis was 12.2 days; however, this was reduced to 6.9 days in 2012 because of the development of new diagnostic circuits for imaging and endoscopy tests. The time to diagnosis in the years 2009–2011 was worse, probably owing to the need for readjustments in care arising from the economic crisis in Spain.

The main reasons for consultation were, in order of frequency, lymphadenopathy with suspicion of malignancy, involuntary weight loss, actual or suspected tumors, anemia, abdominal pain, and abnormalities in simple radiography and CT, which together constituted 74.5% of the cases.

Interestingly, while anemia was the main reason for consultation in 27.5% of the patients referred to a QDU of another Spanish tertiary university hospital,[7] in our series, anemia was the reason for consultation in only 12.6% of the patients. This is because, according to the QDU referral criteria agreed with PHC physicians, microcytic anemia would be studied in PHC except for patients with a high suspicion of neoplasia.

In addition, while lymphadenopathy was the reason for consultation in 10.6% of the patients from the above series,[7] in our QDU, lymphadenopathy was the leading reason for consultation (24.2%). This is undoubtedly due to the introduction of a protocolized preferential circuit, which has been well-publicized in primary care, for the performance of FNPA for enlarged nodes and accessible tumors, which was created in conjunction with the pathology department.

The high rate of consultations for involuntary weight loss and anemia syndrome is a common finding in other QDUs, and is due to the fact that these 2 process are the leading causes of hospitalization for diagnostic tests in Spain.[17] A study that assessed the appropriateness of hospitalization in an internal medicine department using the AEP found that in 70% of the cases, hospitalizations for involuntary weight loss were not justified.[2] QDU evaluation may thus be useful in reducing such hospitalizations.

The main final diagnosis was cancer. The high number of lymphomas can again be attributed to the preferential circuit for quick evaluation of

lymphadenopathies. Of the FNPA negative for lymphoma, 91 were nonspecific adenitis and, importantly, in 11 cases, nodular tuberculosis was diagnosed as the only manifestation of the disease. The most common solid tumors were of gastrointestinal origin. The low percentage of lung, breast, gynecological, urological, and head/neck cancers is certainly due to the existence of specialized functional units for each of these cancers in a tertiary hospital such as ours.

The satisfaction survey was answered by 98.1% of the patients. Ninety-seven percent of the patients were completely or very satisfied and 96% preferred the QDU to conventional hospitalization.

QDU evaluation was estimated to help avoid hospitalization for a diagnostic study in 71.5% of the patients, which led to the freeing-up of 7 internal medicine beds per day during the study period, and resulted in financial savings.

Since the introduction of the Quick and Early Diagnosis Unit of the Queen Elizabeth Hospital, Birmingham, United Kingdom in 1996,[16] various QDUs have been created for the specialized care of different types of cancer. However, QDU dependent on internal medicine departments, such as that described in this study, seem only to have been introduced in Spain, according to studies on their efficacy.[7,8,12] While the differences between QDUs are explained by structural differences, frequent clinical presentations with nonspecific symptoms such as involuntary weight loss, anemia, and lymphadenopathy in generally healthy people with potentially serious illness suggest the need for outpatient study in QDU led by versatile internal medicine specialists. As a result of his or her broad perspective, the internist may be able to recognize the whole clinical scenario of each patient, while closely collaborating with specialists and allocating limited resources in a judicious and fair way.[18]

In comparative studies with conventional hospitalization for diagnostic process, QDUs have been shown to be equally efficacious, less costly, and associated with greater patient satisfaction for the study of potential severe diseases including severe anemia and cancer.[7,8] Moreover, the QDU model has been shown to be efficacious in avoiding referrals from PHCs to the ED.[8,17]

A limitation of our study is that we did not perform a comparative analysis with hospitalized patients or a cost analysis. Yet our results seem to show the high clinical efficiency of a QDU depending on an internal medicine department of a tertiary hospital and further confirm the high degree of patient satisfaction and acceptance of this type of unit. As seen in the application of the AEP in matching hospital admissions,[19,20] the fact that the physician in charge of the QDU is the same who determines the appropriateness of the referral may introduce a bias that tends to overestimate the inadequacies, which is another limitation. The same is true for the proportion of hospitalizations avoided, which would be biased upward.

In conclusion, a QDU may be a feasible and safe alternative to conventional hospital admission for the diagnosis of patients with suspected serious disease. Appropriately managed and supported, they can lighten the burden of EDs and reduce the need for hospital beds. Future research should study the cost-effectiveness of this model compared with hospitalization. In addition, it would be most valuable to examine whether the improvement in the time to diagnosis of these units affects the prognosis of patients.[21]

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# Perception of quality of care of patients with potentially severe diseases evaluated at a distinct quick diagnostic delivery model: a cross-sectional study

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**Abstract**

**Background:** Although hospital-based outpatient quick diagnosis units (QDU) are an increasingly recognized cost-effective alternative to hospitalization for the diagnosis of potentially serious diseases, patient perception of their quality of care has not been evaluated well enough. This cross-sectional study analyzed the perceived quality of care of a QDU of a public third-level university hospital in Barcelona.

**Methods:** One hundred sixty-two consecutive patients aged ≥ 18 years attending the QDU over a 9-month period were invited to participate. A validated questionnaire distributed by the QDU attending physician and completed at the end of the first and last QDU visit evaluated perceived quality of care using six subscales.

**Results:** Response rate was 98 %. Perceived care in all subscales was high. Waiting times were rated as 'short'/'very short' or 'better'/'much better' than expected by 69–89 % of respondents and physical environment as 'better'/'much better' than expected by 94–96 %. As to accessibility, only 3 % reported not finding the Unit easily and 7 % said that frequent travels to hospital for visits and investigations were uncomfortable. Perception of patient–physician encounter was high, with 90–94 % choosing the positive extreme ends of the clinical information and personal interaction subscales items. Mean score of willingness to recommend the Unit using an analogue scale where 0 was 'never' and 10 'without a doubt' was 9.5 (0.70). On multivariate linear regression, age >65 years was an independent predictor of clinical information, personal interaction, and recommendation, while age 18–44 years was associated with lower scores in these subscales. No schooling predicted higher clinical information and recommendation scores, while university education had remarkable negative influence on them. Having ≥4 QDU visits was associated with lower time to diagnosis and recommendation scores and malignancy was a negative predictor of time to diagnosis, clinical information, and recommendation.

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**Discussion:** It is worthy of note that the questionnaire evaluated patient perception and opinions of healthcare quality including recommendation rather than simply satisfaction. It has been argued that perception of quality of care is a more valuable approach than satisfaction. In addition to embracing an affective dimension, satisfaction appears more dependent on patient expectations than is perception of quality.

**Conclusions:** While appreciating that completing the questionnaire immediately after the visit and its distribution by the QDU physician may have affected the results, scores of perceived quality of care including recommendation were high. There were, however, significant differences in several subscales associated with age, education, number of QDU visits, and diagnosis of malignant vs. benign condition.

**Keywords:** Quick diagnosis unit, Perception of quality, Recommendation, Satisfaction, Outpatients, Personal interaction, Clinical information, Waiting times, Physical environment, Regression coefficient

## Background

In Spain and other countries, patients needing diagnostic examinations for potentially serious diseases have traditionally occupied acute beds, without requiring actual therapy [1–4]. While it has been reported that up to 20 % of Spanish patients hospitalized in general internal medicine wards could have be studied as outpatients [2, 5–9], European studies have shown that inappropriate use of hospital beds surpasses 20 % through diverse specialties [3, 10–13]. A study by Campbell *et al.* revealed that, if given the choice, 60 % of physicians would contemplate an alternative to hospitalization for these patients and that 70 % of patients would choose not to be admitted for undergoing diagnostic examinations [11].

Lengthy waits in diagnostic workups owe to insufficiencies in outpatient services, with diagnosis in such settings being unfeasible, even when quick investigations for suspected cancer are necessary [14–16]. Because current referral procedures for diagnosis and specialized care in primary healthcare centers (PCCs) are prolonged, especially in public health systems such as the Spanish one, PCC physicians commonly refer patients with suspected serious diseases to the emergency department (ED) with the hope to gain quick access to examinations via hospitalization [12, 13, 17, 18]. Alternatively, patients are free to pay for diagnostic tests such as a CT scan or MRI using a private provider [19].

These shortcomings have led to the design of alternatives to conventional hospitalization for medical disorders, more recently hospital-based outpatients quick diagnosis units (QDUs). Although still little known today, this type of units, run by internists, nurses, and secretarial staff, have been established in Europe, and they have been principally studied in Spain [1, 2, 4, 12–15, 17, 18, 20–24]. The advantages over conventional hospitalization are numerous: in addition to ensuring an early diagnosis, QDUs avoid hospital-related morbidity, decrease ED referrals from PCCs and decongestion overcrowded ED, and help decrease unnecessary health costs of traditional hospitalization without lowering the quality of diagnostic practice and patient care [2, 12, 14, 17, 18, 21–24]. Yet for QDUs to succeed, the following requirement are expected to be met: 1) clear pre-established referral criteria; 2) patients should be well enough to attend outpatient appointments for visits and diagnostic tests; 3) their first visit has to occur as soon as possible after referral; and 4) they should have preferential access to diagnostic tests [12, 13].

Because a critical element of this innovative approach is to cause a minimal disruption of the patient's daily life, patient opinion on the QDU model would be expected to be high. However, no study has analyzed in detail patient perception of or satisfaction with the quality of care delivered by these units. Indeed, increasing interest in taking into account patient opinions of the quality of healthcare services has led to the elaboration of many measurement tools (i.e. questionnaires) meant to measure patient satisfaction, perception, or experience [25, 26]. Such surveys are important not only to guide subsequent service delivery but also because they may impact clinical outcomes [27, 28]. While surveys have been conducted across a broad range of clinical settings (e.g. hospital outpatients clinics, inpatients, and primary care) [29], only two studies, one published in a Spanish-language [2] and other in an English-language journal [21] have reported some general information about satisfaction with QDU, as a part of a comprehensive descriptive analysis of the functioning and usefulness of these units.

The purpose of this study was to evaluate, using a validated questionnaire, patient perception of quality of care of a QDU of a public third-level university hospital in Barcelona (Spain) and to analyze the relationship of perceived quality to background patient factors.

## Methods

### Design, setting and participants

One hundred sixty-two consecutive patients aged ≥ 18 years attending the QDU over a 9-month period (from 6 March 2012 to 7 December 2012, with about 18 patients on average per month) were invited to participate in a cross-sectional study.

The QDU is part of the internal medicine department of the Bellvitge University Hospital, Barcelona, Spain, a third-level public hospital with 906 acute beds serving a reference population of 343,200. The hospital is a reference center for more than 2 million people for high technology processes, and is equipped with all medical and surgical specialties except obstetrics and pediatrics. The QDU comprises an internal medicine specialist and a nurse, who work for 7 hours a day, 2 days a week in the Unit, with coordinated support from other specialists. The QDU has a consulting room and a waiting room for patients and families. Patients are referred from the ED, PCCs, and specialized outpatient clinics. Predefined referral criteria include peripheral lymphadenopathies, anemia (with or without symptoms) with hemoglobin level <9 g/l, unintentional weight loss (loss of > 10 % of body weight during > 6 weeks), unexplained febrile syndrome (temperature > 38 °C during > 2 weeks), lung and/or pleural radiologic abnormalities, suspected tumor, abdominal mass, unexplained dysphagia, unexplained persistent severe abdominal pain, persistent change in bowel rhythm (>1 month), ascites in non-cirrhotic patients, hepatosplenomegaly, abnormalities in liver function tests, and non-obstructive jaundice [20]. Referrals to QDU are made by the hospital computer system, phone calls or e-mail. The QDU attending physician determines the appropriateness of referrals. The care protocol consists of an urgent first visit followed by preferential programming of diagnostic tests and subsequent visits until a diagnosis is made. In addition to the diagnostic tests typical of a third-level hospital in Spain, there is a dedicated circuit for the evaluation of lymphadenopathy. In particular, in cases of suspected malignant lymphadenopathy, fine-needle aspiration cytology is performed immediately at the time of first patient encounter, with cytological results available in 30 minutes; in addition, since November 2011, immunocytochemical studies, especially flow cytometry, are available for the diagnosis of lymphomas.

### Questionnaire

The questionnaire used (see Additional file 1) was an adaptation of the Patient Satisfaction Survey, originally developed by the Association of Urologists of Columbia (USA) for evaluating the perception of quality of care by patients attended at outpatient urologic clinics [30]. Previous Spanish studies using the original version, translated into Spanish, have been validated for hospital medical outpatients in Spain [31, 32]. These studies appeared to indicate that the questionnaire could be highly suitable for QDU patients. While the questionnaire used in the current study used the same subscales and items as the original version [30], it was adapted to QDU patients by incorporating a specific question about time to diagnosis. The Department of Quality of Bellvitge University Hospital internally validated the questionnaire through a pilot study. The analysis of the psychometric properties of the different subscales showed favorable evidence concerning their reliability and validity. For instance, test reliability revealed a high level of internal consistency for the six subscales with a Cronbach's alpha ranging from 0.77 to 0.89.

The QDU attending physician personally invited all patients to complete the questionnaire in two stages: at the end of the first QDU visit and at the end of the last visit. In the first stage (questions No. 1–8 of the questionnaire: see Additional file 1), patients were asked questions about demographic and education characteristics, previous use of outpatient clinics, previous hospitalizations at Bellvitge University Hospital, ease to find the Unit, name of the QDU physician and nurse, and perceived waiting time on the waiting room. In the second stage (questions No. 9–20 of the questionnaire: see Additional file 1), patients were asked, among others, questions about personal interaction, visit duration, perception of physical environment and clinical information, time to diagnosis, degree of recommendation, and awareness of final diagnosis. Patients having only 1 visit were asked to complete the full questionnaire at the end of this visit.

The own QDU physician distributed the questionnaire with an envelope at the end of first visit to every consecutive patient attending the QDU during the survey period. After completing the first part of the questionnaire, patients returned it to the administrative staff before leaving the facility. At time of last visit, the administrative staff distributed the partly filled forms within their envelopes to patients on arrival and the QDU physician reminded them, at the end of this visit, to complete and return them to the administrative staff before leaving the facility.

There was sufficient time and a private space to answer anonymously at the two stages. Each questionnaire form and its corresponding envelope were marked with a unique identifying number but we assured patients that anonymity would be maintained.

### Measurements

Perceived quality of care was assessed with six subscales containing a total of 15 items. These subscales (and number of items used) were: 1) waiting times (three items); 2) physical environment (three items); 3) accessibility (two items); 4) provider clinical information (four items); 5) personal interaction (two items); and 6) recommendation (one item). Five-point scales were used to score the items composing the waiting times and physical environment subscales. In the 'Duration of visit' item of the waiting times subscale of the original administered questionnaire, a higher score meant 'better', while in the other two items (i.e. 'time on the waiting room' and 'time to diagnosis') a higher score meant 'worse'. Accordingly, to aid comparability, these 2 items were reverse-coded. With regard to the clinical information and personal interaction subscales, although items contained 5 answering options, the last option (code 5) was excluded from the calculation of means as it stands for 'not sure/don't

remember'. Therefore, these two subscales were indeed 4-point scales. The average score for the physical environment, clinical information, and personal interaction subscales was equal to the average of responses to each specific item, then dividing the resulting total score by the number of items of each subscale. Because of the distinctive connotation of the times intended to be perceived in the waiting times subscale, the mean scores were calculated separately for each of the items of this subscale. While the accessibility subscale was assessed with a single dichotomous ('yes/no') variable, the recommendation subscale was measured with the question 'Would you recommend this QDU to a relative with the same disease, in case of need?' A visual analogue scale ranging from 0 ('never') to 10 ('without a doubt') was used. The Unit was considered recommendable when it was rated ≥7 and not recommendable or doubtful when it was rated <7. The questionnaire also included three questions that might implicitly reflect perception of, or overall satisfaction with, quality of care: 1) the question 'Would you have preferred to have been admitted to hospital to study your disease?' was assessed with a single dichotomous ('yes/no') variable; 2) the open question 'What can we do better?' offered the option of writing a free commentary; and 3) an open question with a dichotomous ('yes/no') answer intended to determine whether the respondents had experienced any 'problem' with different aspects of the healthcare process.

Response rates and missing values were checked including no responses and the answering option 'not sure/don't' remember' (code 5 in the clinical information and personal interaction subscales). We intended to exclude from the analyses any item found to have missing value rates ≥10 % [33].

In addition to the information contained in the questionnaires, data were gathered on monthly income, referral sources, mean wait times from referral to first visit, clinical reasons for consultation, mean number of visits, mean time to diagnosis, final diagnoses, and onwards referrals.

### Ethical considerations

The Research Ethics Committee of Bellvitge University Hospital approved this study. At the time of first visit, participants were given detailed information about the study and written informed consent was obtained from all them.

### Statistical analyses

Descriptive statistics were calculated to determine patient characteristics. Categorical variables are expressed as absolute frequencies (%). Continuous variables are expressed as mean (standard deviation). Individual questionnaire items were analyzed using the chi-square test and overall subscale scores were analyzed using the *t*-test or Mann–Whitney test, as appropriate. An analysis of variance (ANOVA) was firstly conducted to determine how the mean scores of the different subscales varied by each patient characteristic that was used as a covariate. In order to adjust for confounders and to identify the independent predictors associated with the mean scores of subscales, independent variables that were marginally significant ($P < 0.20$) in bivariate analysis were included in a multivariate linear regression analysis. Predictive variables are expressed in terms of regression coefficients beta ($B$) with 95 % confidence intervals (CI). The level of statistical significance was set to $P < 0.05$. The statistical analyses were performed using SPSS software, version 21 (SPSS Inc., Chicago, Ill, USA).

## Results

A total of 159 outpatients participated in the study, representing a response rate of 98 %. Three (2 %) patients who did not participate stated that they did not have time to take the survey. Table 1 shows the characteristics of the respondents. Main referral sources were the ED (53 %) and PCCs (35 %). The mean (SD) age was 60.5 (17.42) years and 53 % were males. Forty percent of patients had primary education and 30 % had no schooling. The monthly household income was Euros 1201–1800 in 33 % of patients and Euros 901–1200 in 28 %. Thirty-five percent of patients had previously been admitted to our hospital. Mean number of QDU visits (including the first visit) was 2.2 (0.73). Eleven (7 %) patients required 1 visit, 84 (53 %) 2, 43 (27 %) 3, and 21 (13 %) 4 or more visits. The first 159 visits generated 187 successive visits (ratio successive/first =1.18). Clinical reasons for consultation in 65 % of patients were peripheral lymphadenopathies, unintentional weight loss, suspected masses, and anemia. Main diagnoses were malignancy (26 %), benign digestive disorders (11 %), reactive lymphadenopathy (7 %), and anemia (unrelated to malignancy) (5 %). The mean time to diagnosis was 12.2 (8.71) days.

Most patients knew the name of the QDU physician [$n = 154$ (97 %)] and the nurse [$n = 129$ (81 %)]. Table 2 shows the main results in terms of perceived quality of care in the full sample and displays both mean scores as well as relative frequencies. Rates of no responses, which are combined with 'not sure/don't remember' responses in the clinical information and personal interaction subscales, are also shown. As to missing values, no item reached the 10 % cut-off level. Average missing values of all 15 items were 1.4 %, ranging from 0.6 to 1.9 %, suggesting no apparent difficulties in the comprehension of most questions. In addition, the specific rate of 'not sure/don't' remember' responses of the clinical information and personal interaction subscales was 1.7 and 0.9 %, respectively.

**Table 1** Characteristics of survey respondents at the quick diagnosis unit ($N = 159$)

| Variable | N (%) | Mean (SD) |
|---|---|---|
| Age, years | | 60.5 (17.42) |
| 18–44 | 24 (15) | |
| 45–65 | 59 (37) | |
| >65 | 76 (48) | |
| Sex | | |
| Female | 75 (47) | |
| Male | 84 (53) | |
| Education | | |
| University education | 15 (9) | |
| Secondary or professional training | 32 (20) | |
| Primary education | 64 (40) | |
| No schooling | 48 (30) | |
| Monthly household income, Euros[a] | | 1376 (185.11) |
| >1800 | 29 (18) | |
| 1201–1800 | 52 (33) | |
| 901–1200 | 45 (28) | |
| ≤900 | 33 (21) | |
| Previous visits at hospitals' outpatients clinics | 93 (59) | |
| Previous hospitalizations at this hospital | 56 (35) | |
| Referral sources | | |
| Emergency department | 84 (53) | |
| Primary care centers | 55 (35) | |
| Specialized outpatient clinics | 6 (4) | |
| Other | 14 (9) | |
| Wait time from referral to first visit, days[b] | | 3.6 (1.30) |
| Main reasons for consultation | | |
| Peripheral lymphadenopathies | 39 (25) | |
| Unintentional weight loss | 24 (15) | |
| Suspicion/palpation of masses | 22 (14) | |
| Anemia | 19 (12) | |
| QDU visits, number | | 2.2 (0.73) |
| ≤2 | 95 (60) | |
| 3 | 43 (27) | |
| ≥4 | 21 (13) | |
| Time to diagnosis, days[c] | | 12.2 (8.71) |
| Main diagnoses | | |
| Malignancy | 41 (26) | |
| Benign digestive disorders | 18 (11) | |
| Reactive lymphadenopathy | 11 (7) | |
| Anemia (unrelated to malignancy) | 8 (5) | |
| Onwards referrals | | |
| Primary care centers | 83 (52) | |
| Specialized outpatient clinics | 65 (41) | |
| Hospitalization | 8 (5) | |
| Emergency department | 2 (1) | |
| Other | 1 (1) | |

*SD* = standard deviation; *QDU* = quick diagnosis unit.
[a]Income of all household members, after tax deductions. Respondents had to choose one alternative from eight income ranges.
[b]From date of referral to date of first visit. Consecutive days, including weekends and holidays.
[c]From first QDU visit to definitive diagnosis (i.e. last visit)

Waiting time on the waiting room for the first visit was perceived as 'short' or 'very short' by 74 % of respondents and 'just right' by 25 %, with none perceiving it as 'excessive'. While duration of visit was perceived as 'better' or 'much better than expected' by 89 % of respondents, 'as expected' by 7 % and 'worse than expected' by 2 %, time to diagnosis was considered 'short' or 'very short' by 69 %, 'just right' by 25 % and 'excessive' by 6 %. No patient chose the option 'very excessive' or 'much worse than expected' for any item of this subscale. The mean score of the physical environment subscale was 4.5 (0.61), with 94–96 % of respondents rating the three constituting items as 'better' or 'much better than expected'. Apart from 2 (1 %) patients who rated the waiting room noise as 'worse than expected', 'as expected' was the option selected by the remaining respondents for the 3 items of this subscale (3 % for each item) and none chose the response 'much worse than expected' for any item. As to perceived clinical information, its mean score was 3.8 (0.66), with answering option No. 3 being 'usually' and No. 4, 'always'. Specifically, 91 % of respondents reported that they 'always' received clear-cut information on what their disease involved, and 94 % said that they 'always' received clear-cut information on instructions to follow after discharge. Similarly, 'always' was the response selected for information on forthcoming diagnostic tests and for information on the risks of diagnosis and treatment by 92 and 91 % of patients, respectively. While 'usually' was the most common answer after 'always' for all items of this subscale, 3 (2 %) respondents answered 'rarely' for information about meaning of disease, and 3 (2 %) also chose 'rarely' for information about risks of diagnosis and treatment. No individual responded 'never'. The mean score of the personal interaction subscale was 3.7 (0.56), with answering choice No. 3 being 'usually' and No. 4, 'always'. In particular, 91 % of respondents reported that healthcare staff 'always' treated them with kindness, and 90 % said that healthcare staff 'always' did their best to help when needed. While the 'usually' response was chosen by 9 (6 %) patients for the item 'kindness' of healthcare staff and by 8 (5 %) for the item 'help' of healthcare staff, 'rarely' was selected by 2 (1 %)

**Table 2** Patient scores and responses for individual items and subscales of perceived quality of care and recommendation

| Subscales and items | Scores Mean (SD) | N (%) |
|---|---|---|
| Waiting times | | |
| Waiting time on the waiting room[a] | 3.8 (0.78) | |
| (1–5) (1 = very excessive; 5 = very short) | | |
| Scored 4–5 | | 117 (74) |
| Scored 3 | | 40 (25) |
| No response | | 2 (1) |
| Duration of visit | 3.9 (0.73) | |
| (1–5) (1 = much worse than expected; 5 = much better than expected) | | |
| Scored 4–5 | | 142 (89) |
| Scored 2–3 | | 14 (9) |
| No response | | 3 (2) |
| Time to diagnosis[a] | 3.7 (0.82) | |
| (1–5) (1 = very excessive; 5 = very short) | | |
| Scored 4–5 | | 109 (69) |
| Scored 2–3 | | 49 (31) |
| No response | | 1 (1) |
| Physical environment | 4.5 (0.61) | |
| (1–5) (1 = much worse than expected; 5 = much better than expected) | | |
| Consultation office temperature | 4.6 (0.55) | |
| Scored 4–5 | | 151 (95) |
| Scored 2–3 | | 5 (3) |
| No response | | 3 (2) |
| Waiting room noise | 4.5 (0.61) | |
| Scored 4–5 | | 150 (94) |
| Scored 2–3 | | 6 (4) |
| No response | | 3 (2) |
| Consultation office cleanliness | 4.7 (0.52) | |
| Scored 4–5 | | 153 (96) |
| Scored 2–3 | | 4 (3) |
| No response | | 2 (1) |
| Clinical information | 3.8 (0.66) | |
| (1–4) (1 = never; 4 = always) | | |
| Meaning of disease | 3.8 (0.72) | |
| Scored 4 | | 145 (91) |
| Scored 2–3 | | 10 (6) |
| Not sure/don't' remember/No response | | 4 (3) |
| Diagnostic tests | 3.9 (0.62) | |
| Scored 4 | | 147 (92) |
| Scored 2–3 | | 6 (4) |
| Not sure/don't' remember/No response | | 6 (4) |
| Risks of diagnostic tests and treatment | 3.8 (0.67) | |
| Scored 4 | | 144 (91) |
| Scored 2–3 | | 9 (6) |

**Table 2** Patient scores and responses for individual items and subscales of perceived quality of care and recommendation *(Continued)*

| | | |
|---|---|---|
| Not sure/don't' remember/No response | | 6 (4) |
| Instructions after discharge | 3.9 (0.63) | |
| Scored 4 | | 149 (94) |
| Scored 2–3 | | 7 (4) |
| Not sure/don't' remember/No response | | 3 (2) |
| Personal interaction | 3.7 (0.56) | |
| (1–4) (1 = never; 4 = always) | | |
| Kindness of healthcare staff | 3.8 (0.50) | |
| Scored 4 | | 145 (91) |
| Scored 2–3 | | 11 (7) |
| Not sure/don't' remember/No response | | 3 (2) |
| Help of healthcare staff when needed | 3.7 (0.55) | |
| Scored 4 | | 143 (90) |
| Scored 2–3 | | 11 (7) |
| Not sure/don't' remember/No response | | 5 (3) |
| Accessibility | | 149 (94) |
| Found the unit easily | | |
| Yes | | 151 (95) |
| No | | 5 (3) |
| No response | | 3 (2) |
| Found uncomfortable to travel frequently to hospital | | |
| Yes | | 11 (7) |
| No | | 146 (92) |
| No response | | 2 (1) |
| Willingness to recommend the Unit | 9.5 (0.70) | |
| (0–10) (0 = never; 10 = without a doubt) | | |
| Rated < 7 | | 6 (4) |
| Rated ≥ 7 | | 151 (95) |
| No response | | 2 (1) |

*SD* = standard deviation.
[a]Reverse-coded for the purpose of the analysis

and by 3 (2 %) respondents for the former and latter items, respectively. No individual answered 'never'. With regard to accessibility, only 3 % of respondents reported that they did not find the Unit easily and 7 % said that frequent travels to hospital for QDU visits and diagnostic tests were uncomfortable (Table 2). The mean score of the recommendation subscale was 9.5 (0.70). The Unit was considered recommendable (score ≥7) by 95 % of respondents and not recommendable or doubtful (score <7) by 4 %. Of note, 129 (81 %) respondents scored 10/10 and none scored <5/10.

At the end of the QDU evaluation, only 6 (4 %) patients did not know their diagnosis, of whom 4 had no schooling and 2 had primary education. Furthermore, while 149 (94 %) patients said that they would not have preferred hospitalization to study their disease, the opposite was true for 6 (4 %), and 4 (3 %) did not respond. The most frequent answer to the question 'What can we do better?' was 'nothing' in 134 (84 %) respondents, and the remaining did not write any commentary. Finally, 6 (4 %) patients stated that they had experienced some 'problem' with the process. While 4 (3 %) reported that they were not given accurate information to locate the Unit easily, 2 (1 %) said that time to diagnosis was too long.

Tables 3 and 4 show the mean scores of the physical environment, waiting times, clinical information, personal interaction, and recommendation subscales according to patient characteristics on ANOVA. Scores did not differ by respondents' sex, monthly income, and previous hospitalization. However, there were some significant

**Table 3** Mean scores of physical environment and waiting times subscales according to patient characteristics

| Variable | Physical environment | *P* value | Waiting times | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | For visit[a] | *P* value | Visit duration | *P* value | Time to diagnosis[a] | *P* value |
| Age, years | | 0.15 | | 0.36 | | **0.006** | | **0.001** |
| 18–44 | 4.4 (0.72) | | 3.7 (0.84) | | 3.5 (0.86) | | 3.2 (0.93) | |
| 45–65 | 4.5 (0.65) | | 3.8 (0.80) | | 3.7 (0.78) | | 3.5 (0.82) | |
| > 65 | 4.6 (0.57) | | 3.8 (0.76) | | 4.1 (0.71) | | 3.9 (0.79) | |
| Sex | | 0.18 | | 0.20 | | 0.19 | | 0.28 |
| Female | 4.4 (0.71) | | 3.7 (0.82) | | 3.8 (0.77) | | 3.8 (0.81) | |
| Male | 4.6 (0.63) | | 3.9 (0.77) | | 4.0 (0.70) | | 3.7 (0.78) | |
| Education | | 0.10 | | 0.09 | | **0.01** | | **0.04** |
| University education | 4.4 (0.81) | | 3.6 (0.88) | | 3.6 (0.91) | | 3.4 (0.94) | |
| Secondary/PT | 4.4 (0.75) | | 3.7 (0.81) | | 3.7 (0.83) | | 3.5 (0.84) | |
| Primary education | 4.5 (0.63) | | 3.8 (0.78) | | 4.0 (0.70) | | 3.8 (0.71) | |
| No schooling | 4.7 (0.60) | | 3.9 (0.79) | | 4.1 (0.74) | | 3.8 (0.77) | |
| Monthly income, Euros | | 0.33 | | 0.22 | | 0.19 | | 0.29 |
| > 1800 | 4.5 (0.73) | | 3.8 (0.86) | | 3.8 (0.87) | | 3.7 (0.89) | |
| 1201–1800 | 4.6 (0.61) | | 3.8 (0.76) | | 3.9 (0.72) | | 3.8 (0.75) | |
| 901–1200 | 4.5 (0.64) | | 3.7 (0.78) | | 3.9 (0.75) | | 3.7 (0.79) | |
| ≤ 900 | 4.6 (0.69) | | 3.9 (0.83) | | 4.0 (0.84) | | 3.8 (0.82) | |
| Previous hospitalization | | 0.31 | | 0.35 | | 0.27 | | 0.21 |
| Yes | 4.4 (0.79) | | 3.9 (0.82) | | 4.0 (0.83) | | 3.8 (0.88) | |
| No | 4.5 (0.62) | | 3.8 (0.75) | | 3.9 (0.74) | | 3.6 (0.79) | |
| QDU visits, number | | 0.17 | | 0.07 | | 0.08 | | **<0.001** |
| ≤ 2 | 4.5 (0.54) | | 3.9 (0.70) | | 4.0 (0.68) | | 3.9 (0.77) | |
| 3 | 4.5 (0.68) | | 3.7 (0.80) | | 3.9 (0.77) | | 3.7 (0.84) | |
| ≥ 4 | 4.3 (0.77) | | 3.6 (0.88) | | 3.7 (0.99) | | 3.1 (1.05) | |
| Diagnosis | | 0.16 | | 0.34 | | 0.06 | | **<0.001** |
| Malignancy | 4.4 (0.78) | | 3.7 (0.86) | | 3.7 (0.88) | | 2.9 (1.01) | |
| Benign disorders | 4.6 (0.60) | | 3.8 (0.77) | | 4.0 (0.76) | | 3.8 (0.78) | |

*PT* = professional training; *QDU* = quick diagnosis unit.
[a]Reverse-coded.
Bolded values are statistically significant

differences for the rest of variables analyzed. Older respondents, and especially those aged > 65 years, had a better perception of visit duration, time to diagnosis, clinical information, and personal interaction, and they also reported higher recommendation scores. In addition, respondents with no schooling and primary education scored better than those with higher education levels the same items and subscales as older respondents except personal interaction. Patients having ≥4 QDU visits scored time to diagnosis and recommendation worse than those with 3 and especially ≤2 visits. When final diagnoses were dichotomized into malignant and non-malignant conditions, patients with malignancy scored time to diagnosis, clinical information, and recommendation worse than those with benign conditions (Tables 3 and 4). Finally, regarding accessibility, among the 11 (7 %) respondents who said that frequent travels to hospital were uncomfortable, 9 (12 %) were older than 65 years and 2 (3 %) were aged 37 and 52 years. The 5 (3 %) respondents who did not find the Unit easily were all older subjects: 3 were older than 65 years and 2 were aged 62 and 63 years. Reported answers in the accessibility subscale did not differ by other respondents' variables.

Tables 5 and 6 show the independent predictors of perceived quality of care in the physical environment, waiting times, clinical information, personal interaction, and recommendation subscales on multivariate linear regression analysis with adjusted *B* coefficients. While an age older than 65 years was a significant predictor of perceived clinical information and personal interaction and of recommendation ($B = 0.19$, 0.24, and 0.23; $P < 0.05$, <0.001, and <0.01, respectively), an age of 18–44 years was associated with

**Table 4** Mean scores of clinical information, personal interaction, and recommendation subscales according to patient characteristics

| Variable | Clinical information | *P* value | Personal interaction | *P* value | Recommendation | *P* value |
|---|---|---|---|---|---|---|
| Age, years | | **<0.001** | | **<0.001** | | **<0.001** |
| 18–44 | 3.1 (0.79) | | 3.0 (0.83) | | 8.9 (0.93) | |
| 45–65 | 3.5 (0.72) | | 3.4 (0.73) | | 9.3 (0.84) | |
| >65 | 3.9 (0.62) | | 3.9 (0.52) | | 9.8 (0.66) | |
| Sex | | 0.35 | | 0.18 | | 0.20 |
| Female | 3.7 (0.67) | | 3.8 (0.60) | | 9.6 (0.75) | |
| Male | 3.8 (0.63) | | 3.6 (0.57) | | 9.4 (0.72) | |
| Education | | **<0.001** | | 0.10 | | **<0.001** |
| University education | 2.9 (0.86) | | 3.6 (0.74) | | 8.7 (1.22) | |
| Secondary/professional training | 3.5 (0.77) | | 3.6 (0.69) | | 9.3 (0.86) | |
| Primary education | 3.9 (0.64) | | 3.7 (0.60) | | 9.6 (0.72) | |
| No schooling | 3.9 (0.66) | | 3.9 (0.57) | | 9.7 (0.74) | |
| Monthly income, Euros | | 0.22 | | 0.15 | | 0.17 |
| >1800 | 3.7 (0.77) | | 3.6 (0.75) | | 9.4 (0.90) | |
| 1201–1800 | 3.8 (0.64) | | 3.7 (0.55) | | 9.6 (0.71) | |
| 901–1200 | 3.8 (0.69) | | 3.8 (0.59) | | 9.5 (0.74) | |
| ≤900 | 3.9 (0.73) | | 3.8 (0.65) | | 9.6 (0.80) | |
| Previous hospitalization | | 0.31 | | 0.33 | | 0.55 |
| Yes | 3.7 (0.76) | | 3.8 (0.69) | | 9.5 (0.82) | |
| No | 3.8 (0.64) | | 3.7 (0.57) | | 9.5 (0.68) | |
| QDU visits, number | | 0.34 | | 0.48 | | **0.002** |
| ≤2 | 3.8 (0.59) | | 3.7 (0.61) | | 9.6 (0.67) | |
| 3 | 3.8 (0.65) | | 3.7 (0.64) | | 9.5 (0.75) | |
| ≥4 | 3.7 (0.82) | | 3.7 (0.73) | | 8.9 (1.09) | |
| Diagnosis | | **0.007** | | 0.06 | | **0.008** |
| Malignancy | 3.3 (0.81) | | 3.5 (0.72) | | 9.1 (0.99) | |
| Benign disorders | 3.9 (0.63) | | 3.8 (0.59) | | 9.7 (0.69) | |

*QDU* = quick diagnosis unit.
Bolded values are statistically significant

lower mean scores in all three subscales ($B = -0.18$, $-0.19$, and $-0.17$, respectively; $P < 0.05$ in all). Furthermore, while no schooling was a significant predictor of clinical information and recommendation ($B = 0.18$ and $0.17$; $P < 0.05$), having a university education had a strong, albeit negative, influence on mean scores of the two subscales ($B = -0.24$ and $-0.22$; $P < 0.001$ and $<0.01$, respectively). Having ≥ 4 QDU visits was associated with lower recommendation ($B = -0.17$; $P < 0.05$) and time to diagnosis scores ($B = -0.25$; $P < 0.001$). Malignancy was also significantly associated with lower time to diagnosis, clinical information, and recommendation mean scores ($B = -0.27$, $-0.20$, and $-0.18$; $P < 0.001$, $<0.05$, and $<0.05$, respectively) (Tables 5 and 6).

## Discussion

This study presents the first detailed evidence about patient perception of quality of care of QDUs. Our results show that perceived care in all subscales and items was highly considered by most respondents. Of note, the mean score of the recommendation subscale was 9.5/10, with 81 % of respondents reporting that they would recommend the Unit 'without a doubt' (score of 10/10). However, regression analysis revealed that mean scores of several subscales varied significantly regarding patient age, education, number of QDU visits, and diagnosis of malignant vs. benign disorder.

Perceived quality of or satisfaction with QDUs has been poorly evaluated. In a Spanish-language descriptive study of a QDU run by internists at a Spanish second-level hospital near Barcelona, Capell *et al.* reported some data about patient opinion on the care delivered by their Unit [2]. Different samples of patients were interviewed by telephone two times, 3 months and 2 years after the introduction of QDU. The interview was performed two months after patient discharge using an in-house questionnaire with 20 questions (4 options per question),

**Table 5** Multivariate regression analysis of perceived quality of care in physical environment and waiting times subscales across patient characteristics

| Variable | Physical environment | | Time on waiting room | | Visit duration | | Time to diagnosis | |
|---|---|---|---|---|---|---|---|---|
| | B[a] | 95 % CI | B[a] | 95 % CI | B[a] | 95 % CI | B[a] | 95 % CI |
| Age, years | | | | | | | | |
| 18–44 | −0.02 | −0.30, 0.29 | −0.03 | −0.31, 0.27 | −0.09 | −0.39, 0.21 | −0.13 | −0.42, 0.16 |
| 45–65 (reference) | | | | | | | | |
| > 65 | 0.03 | −0.27, 0.32 | 0.01 | −0.28, 0.30 | 0.15 | −0.14, 0.45 | 0.16 | −0.13, 0.47 |
| Sex | | | | | | | | |
| Female | −0.02 | −0.11, 0.07 | −0.01 | −0.09, 0.11 | −0.01 | −0.10, 0.09 | 0.01 | −0.08, 0.10 |
| Male (reference) | | | | | | | | |
| Education | | | | | | | | |
| University education | 0.01 | −0.19, 0.21 | −0.02 | −0.21, 0.17 | −0.01 | −0.21, 0.18 | −0.01 | −0.20, 0.19 |
| Secondary/PT (reference) | | | | | | | | |
| Primary education | 0.02 | −0.18, 0.22 | 0.01 | −0.17, 0.20 | 0.12 | −0.08, 0.29 | 0.13 | −0.08, 0.29 |
| No schooling | 0.09 | −0.10, 0.28 | 0.03 | −0.17, 0.22 | 0.16 | −0.03, 0.33 | 0.12 | −0.07, 0.31 |
| Income, Euros | | | | | | | | |
| > 1800 | −0.09 | −0.18, 0.02 | 0.01 | −0.08, 0.10 | −0.08 | −0.16, 0.03 | −0.07 | −0.15, 0.02 |
| 1201–1800 (reference) | | | | | | | | |
| 901–1200 | −0.09 | −0.20, 0.06 | −0.07 | −0.19, 0.10 | 0.02 | −0.12, 0.17 | −0.08 | −0.18, 0.09 |
| ≤ 900 | 0.02 | −0.09, 0.13 | 0.11 | −0.02, 0.24 | 0.12 | 0.02, 0.27 | 0.01 | −0.10, 0.11 |
| QDU visits | | | | | | | | |
| ≤ 2 (reference) | | | | | | | | |
| 3 | 0.01 | −0.28, 0.30 | −0.04 | −0.38, 0.30 | −0.01 | −0.36, 0.34 | −0.06 | −0.40, 0.28 |
| ≥ 4 | −0.05 | −0.39, 0.30 | −0.09 | −0.43, 0.25 | −0.10 | −0.44, 0.26 | −0.25[b] | −0.61, 0.12 |
| Diagnosis | | | | | | | | |
| Malignancy | −0.05 | −0.44, 0.36 | −0.02 | −0.41, 0.37 | −0.12 | −0.51, 0.27 | −0.27[b] | −0.68, 0.15 |
| Benign diseases (reference) | | | | | | | | |

*CI* = confidence interval; *PT* = professional training; *QDU* = quick diagnosis unit.
[a]Adjusted regression coefficient beta. Positive values indicate a higher mean score relative to the referent category, while negative values indicate a lower mean score compared with the reference category.
[b]$P < 0.001$

which assessed overall satisfaction, degree of difficulty of travel to hospital, and preference for type of care in subsequent episodes. The response rate was 65 and 85 % in the two study periods, respectively. The findings were similar on both occasions: while a high overall satisfaction was reported by 95 % of respondents, repeated travels to hospital were not an important difficulty, and 80 % of patients reported that they would prefer the QDU care model over conventional hospitalization should they require a new diagnostic evaluation.

These results were similar to those subsequently reported in an English-language journal [21]. In this study, whose main objective was to analyze the usefulness and costs of an internal medicine QDU compared to hospitalization in a Spanish third-level university hospital in Barcelona, a random sample of patients were interviewed by telephone 3 months after discharge. The authors used a questionnaire similar to that of Capell *et al.* [2] to evaluate similar aspects. While the response rate was 94 %, overall satisfaction with QDU was high in 93 % of cases, repeated travel to hospital was not considered a major difficulty, and 84 % of patients would choose the QDU instead of hospitalization should a further diagnostic workup be required [21]. Unlike our study, however, these former reports did not define specific subscales and constituting items and did not provide detailed results other than the overall percentages mentioned above.

The high response rate of our study (98 %) may be related to the fact that the QDU attending physician invited patients to participate in it by distributing the questionnaire in hand at the end of first visit, then reminding them to complete it at the end of last visit. While one of the most common administration methods consists of handing out questionnaires immediately after, or during, service use [28], this may result in overestimation of satisfaction (see limitations of the study below) [34].

**Table 6** Multivariate regression analysis of perceived quality of care in clinical information and personal interaction subscales and recommendation across patient characteristics

| Variable | Clinical information | | Personal interaction | | Recommendation | |
|---|---|---|---|---|---|---|
| | B[a] | 95 % CI | B[a] | 95 % CI | B[a] | 95 % CI |
| Age, years | | | | | | |
| 18–44 | −0.18[b] | −0.47, 0.11 | −0.19[b] | −0.48, 0.10 | −0.17[b] | −0.42, 0.08 |
| 45–65 (reference) | | | | | | |
| > 65 | 0.19[b] | −0.09, 0.46 | 0.24[c] | −0.06, 0.53 | 0.23[d] | −0.07, 0.53 |
| Sex | | | | | | |
| Female | −0.02 | −0.10, 0.08 | 0.04 | −0.06, 0.15 | 0.12 | 0.02, 0.21 |
| Male (reference) | | | | | | |
| Education | | | | | | |
| University education | −0.24[c] | −0.43, −0.03 | 0.01 | −0.15, 0.20 | −0.22[d] | −0.41, −0.03 |
| Secondary/PT (reference) | | | | | | |
| Primary education | 0.16 | −0.04, 0.36 | 0.02 | −0.16, 0.21 | 0.10 | −0.09, 0.30 |
| No schooling | 0.18[b] | −0.03, 0.39 | 0.11 | −0.08, 0.31 | 0.17[b] | −0.02, 0.33 |
| Income, Euros | | | | | | |
| > 1800 | −0.08 | −0.14, 0.03 | −0.06 | −0.15, 0.03 | −0.10 | −0.2, 0.01 |
| 1201–1800 (reference) | | | | | | |
| 901–1200 | 0.01 | −0.13, 0.14 | 0.10 | −0.05, 0.16 | −0.11 | −0.25, 0.12 |
| ≤ 900 | 0.09 | −0.04, 0.22 | 0.10 | −0.02, 0.13 | 0.03 | −0.09, 0.16 |
| QDU visits | | | | | | |
| ≤ 2 (reference) | | | | | | |
| 3 | 0.01 | −0.34, 0.35 | 0.02 | −0.27, 0.33 | −0.01 | −0.35, 0.32 |
| ≥ 4 | −0.02 | −0.37, 0.33 | 0.02 | −0.32, 0.40 | −0.17[b] | −0.52, 0.16 |
| Diagnosis | | | | | | |
| Malignancy | −0.20 [b] | −0.59, 0.21 | −0.09 | −0.48, 0.30 | −0.18[b] | −0.57, 0.21 |
| Benign diseases (reference) | | | | | | |

*CI* = confidence interval; *PT* = professional training; *QDU* = quick diagnosis unit.
[a]Adjusted regression coefficient beta. Positive values indicate a higher mean score relative to the referent category, while negative values indicate a lower mean score compared with the reference category.
[b]$P < 0.05$.
[c]$P < 0.001$.
[d]$P < 0.01$

The questionnaire selected for this study needed to be fairly brief, understandable and easy to complete. Although there are discrepancies [35], low levels of education are reportedly related to difficulties in assimilating crucial information, most notably on diagnosis and discharge instructions [36, 37], which may affect questionnaire dimensions and reported satisfaction. Seventy percent of our respondents had no schooling or primary education (55–57 % of respondents in previous Spanish hospital outpatients studies using this questionnaire [31, 32]), consistent with education data reported in a former study conducted in our hospital [20].

Perceived quality of care in all subscales was indeed high. Regarding waiting times, 69, 74 and 89 % of respondents chose the options 'short'/'very short' or 'better'/'much better' than expected for time to diagnosis, wait on waiting room, and visit duration, respectively. Former surveys have shown that waiting time, either perceived or real, influences satisfaction [29, 38–40]. While longer waits on waiting rooms have a strongly negative correlation with overall satisfaction [38], longer duration of the consultation time has been associated with higher levels of overall satisfaction in ambulatory practice [39, 40]. The physical environment of hospital outpatient services has also been reported to influence satisfaction [41, 42], with 94–96 % of our respondents scoring it as 'better'/'much better' than expected.

Furthermore, while accessibility, understood as ease to find an outpatient clinic or an in-hospital ward, has been correlated with overall satisfaction [25], most respondents rated positively this subscale, understood as ease/difficulty to find the Unit and to travel frequently to

hospital for outpatient visits and investigations. The fact that only 7 % of patients found repeated travels to hospital uncomfortable is reassuring since, unlike hospitalization, an objective of QDUs is that patients be able to maintain a fairly normal daily activity however serious their condition under study is (e.g. liver metastases) as long as their general health status is well enough [12, 13].

In the clinical management of patients attended in QDUs, where the likelihood of having a severe disease, particularly cancer, is often high and causes worry and anxiety to both patients and relatives (malignancy is the most common diagnosis in Spanish QDUs [14, 15, 24]), evaluating quality of care through the measurement of patient perception of physician supportiveness, empathy, and information giving is essential. Details as simple as knowing the physician name (97 % of our respondents knew it) are important because, as reported, patient receptiveness and satisfaction is higher when the physician introduces himself or herself at the time of the first encounter [31, 32, 37]. In our study, the mean scores of the subscales measuring the perception of the patient–physician encounter were high, with ≥ 90 % of respondents selecting the positive extreme ends of the items constituting the clinical information and personal interaction subscales. There is consistent evidence across healthcare settings that the most significant determinants of patient opinion of and overall satisfaction with quality of care are related to the patient-physician encounter, including interpersonal aspects of care such as an affective and trust-generating behavior (including courtesy, empathy, and supportiveness), information giving and also clinical competences/skills [28, 29, 38, 43–45]. In the case of information giving/physician feedback, overall satisfaction is negatively correlated with scant explanation of the problems and/or the examinations results and, in general, with receiving little information and answers from the medical staff [29, 38, 45–47].

An important finding of our study was that 95 % of respondents reported that they would recommend the Unit to a relative with the same disease, as determined by a score ≥7, with 81 % scoring 10/10. Although not analyzed here, the few studies that have investigated the association between perceived quality of care and willingness to recommend a given provider have revealed some interesting differences between satisfaction and recommendation [29, 48–50]. A study conducted in nearly 2000 patients in PCCs in Taiwan found that physician technical competence/skills was the most critical determinant of perceived quality for both overall satisfaction and recommendation, followed by interpersonal skills [48]. Another study conducted in nearly 5000 patients in 126 Taiwanese hospitals revealed that physician technical competence/skills was a more significant predictor of recommendation than interpersonal skills [49]. Interestingly, 21 % of the 'not satisfied' patients in this study still recommended the hospital, meaning that a hospital with a high number of their patients being satisfied may not receive a comparable level of recommendation. Intriguingly, in both Taiwanese studies [48, 49], the rates of 'no answer' responses to 'recommendation' questions were significantly higher that the rates of 'no answer' responses to 'satisfaction' questions, suggesting that patients may feel more responsible at the time of recommending a healthcare provider, tending to miss the relevant question when they are unsure about its quality. More recently, a multicenter study conducted in a US network of national oncology hospitals showed that perceived quality of care was also an important predictor of patient willingness to recommend the healthcare provider [50]. In this study, 'helping a patient to understand her/his condition', 'caring for a patient as an individual', 'a whole-person approach to care', and 'satisfaction with the medical oncologist' all favored patient willingness to recommend the provider. Evaluating perception of quality of care as a predictor of recommendation appears particularly important in numerous countries where data of service quality are not easily available and recommendations from relatives or friends become the essential source of information for choosing a provider [50]. Although asking patients about their intents to recommend or revisit a provider is frequently used to monitor perceived quality and satisfaction for marketing purposes, it may be argued that such methods may be less appropriate in public health services such as the Spanish one or, for instance, the UK National Health Service, where options are limited and mobility difficulties exist [29].

The most important socio-demographic predictor of satisfaction is age, with older patients being typically more satisfied with healthcare services [28, 29, 38, 45–47, 51–53]. Although studies have also found that patients with lower educational levels are in general more satisfied [28, 38, 46, 48], such association is not always clear-cut, with a number of studies reporting inverse associations (i.e. higher reported satisfaction amongst individuals with lower education attainment), something that might be related to expectations [29].

Despite the high scores observed in all subscales, there were some crucial differences associated with patient age and education on multivariate linear regression. The analysis identified age older than 65 years as an independent predictor of clinical information, personal interaction, and recommendation, while having an age of 18–44 years was significantly associated with lower mean scores in these subscales. The regression analysis also revealed that no schooling predicted higher clinical information and recommendation scores, while having a university education had marked negative influence on these subscales' scores.

Our patients had a mean of 2.2 visits, with 60 % having ≤2 visits. The finding that having ≥4 QDU visits (vs. ≤ 2 visits) was independently associated with lower time to diagnosis and recommendation scores probably reflects the significantly longer mean time to diagnosis of respondents with ≥4 QDU visits (vs. those with ≤2 visits) [16.7 (9.94) days for ≥4 QDU visits vs. 10.8 (8.11) days for ≤2 visits; $P < 0.001$] (data not shown). Although we are not aware of studies analyzing the association between time to diagnosis and perceived quality or satisfaction in outpatients, some studies have evaluated the relationship between in-hospital length of stay (a marker of hospital efficiency and a proxy measure of cost) and satisfaction under the assumption that shorter than expected length of stay could be regarded as suggestive of good quality of healthcare, resulting in higher satisfaction levels (and vice versa) [54, 55].

Rather unexpectedly, malignancy was an independent negative predictor of time to diagnosis, clinical information, and recommendation mean scores on regression analysis. While time to diagnosis of respondents with malignancy was significantly longer than those with non-malignant diseases [15.1 (9.18) vs. 11.0 (7.67) days; $P < 0.001$] (data not shown), the significant association of malignancy with low clinical information and recommendation scores is more difficult to interpret. However, it is known that self-perceived health can be a significant predictor of satisfaction, with poorer physical health status [29, 38, 47, 51–53] and psychological distress [29, 56, 57] being associated with lower satisfaction levels. Accordingly, although not analyzed in this study, it is possible that patients with malignant conditions scored those subscales poorer as a result of a worse physical health performance associated with their disease and the psychological anguish produced by the communication of their final diagnosis, usually at the time of last visit.

Although we identified one aspect of the QDU care process that was worse than expected, patient opinion of it remained high. In particular, compared with other Spanish studies on QDUs [2, 15, 21, 22], the mean time to diagnosis was too long, reflecting delays in diagnostic tests as a consequence of variations in the organization of healthcare services in the hospital related to the Spanish financial crisis. Yet nearly 70 % of patients scored time to diagnosis as short or very short, and, on regression analysis, an age older than 65 years was close to statistical significance ($B$ coefficient = 0.16; $P = 0.07$) (Table 5). This observation may illustrate the concept that it is the patient–physician encounter that mainly determines perceived quality of care and satisfaction rather that the potential patient expectation about this specific item.

It is worthy to note that the study was carried out at a time of a profound economic recession in Spain (March to December 2012), which has caused well-documented detrimental effects on the healthcare system [19, 58]. Briefly, Spain has an advanced, integrated health system that has accomplished noteworthy results, including significantly improved health outcomes, over a fairly short time. Until recently, Spain had one of the world's highest life expectancies, an extremely low infant mortality and was a world leader in organ transplantation and donation [59]. The Spanish system was listed the 7$^{th}$ best worldwide by the World Health Organization in 2000. While Spaniards have been traditionally proud of their system, major national and regional cuts in health spending applied as of late 2010 have not only affected the quality of care but also some health outcomes. For instance, in addition to a remarkable increase in surgical waiting lists and delays in diagnostic tests at both hospital and PCC settings, the prevalence of mental disorders, particularly major depression, and the suicide rate, has increased, mainly as a consequence of unemployment and inability to accomplish mortgage obligations [19, 58, 60]. In contrast to former national surveys revealing highly positive opinions of Spaniards on their healthcare system, a 2013 transnational survey of 12,001 adult patients from 15 countries (mainly high-income countries) showed that Spanish respondents ($n = 1000$) felt that both overall access to healthcare services ('doctor",diagnostic tests',specialist physician",hospital', and 'drugs to treat various ailments') and access to each specific service was more difficult in 2013 than in 2008 [61]. In fact, Spaniards rated their healthcare system as having the lowest improvement over the last five years among all countries. The questionnaire also included a question about patient experience: 'Thinking about your patient experience recently compared to five years ago (in 2008) in going to a doctor and then being diagnosed, referred to a specialist or for surgery, or treated for an accident or serious ailment or condition, have you found it to be'. Possible answers were: 'better information shared with me', 'more options given to me for treatment', 'better quality', 'better coordinated', 'better level of care', 'more sensitive to my needs', and 'speedier'. Spaniards rating of both overall patient experience and of each category of experience compared to 5 years earlier was also the lowest among all countries. The report stated that "it is evident that respondents in Spain have seen a stark degradation in their healthcare services as they take last place in every category" of access to healthcare services and patient experience [61].

Nevertheless, cost-containment measures are leading to some sensible reforms of the system, such as the search and preferential use of alternatives to hospitalization, which is a major component of healthcare costs, including day centers, hospital at home and QDUs [12]. Although QDUs seem more proper for countries with public healthcare systems, inpatient admissions are also a major component of

health costs in the USA, where PCC physicians do not facilitate non-scheduled appointments and ED physicians are more prone to hospitalize patients for a diagnostic workup [62]. As recently reported by US investigators in a systematic review of existing QDUs, "[in] our healthcare system, with the high cost of inpatient care, the QDU can yield large savings of healthcare dollars while expediting diagnostic workup, increasing patient satisfaction, and preventing lost productivity from hospital stays" [24]. One may wonder how, and to what extent, the aforementioned adverse effects of the economic crisis on the healthcare system and the reduced expectations of Spaniards about their system during the study period may relate to the observed high levels of perceived quality of care reported by our participants. Although no study has been reported on the potential influence of the financial crisis on patient satisfaction in Spain, we believe that it is precisely the essence, objectives, and reported outcomes of the QDU model that explain these results. Because of their dynamic, agile functioning and the savings generated, QDUs are currently viewed as having strong implications in Spain and possibly other countries with public health systems, where ambulatory practice is also under severe pressure. In Spain, QDUs have become a paradigm of publicly financed hospital-based outpatient units that help overcome diagnostic and referral delays and the overall difficulties faced by physicians at PCCs and EDs in ensuring quick access to investigations. Indeed, the poor coordination between primary and hospital care in Spain is reflected by the fact that, in practice, only hospitalized patients are firstly selected for prompt diagnostic examinations [12, 15, 16].

Our study has some limitations. First, the high levels of perceived quality of care including recommendation may indicate true quality of care but also reflect some methodological limitations. Thus, despite the high response rate and measures to preserve confidentiality, completing the questionnaire immediately after the visit and the fact that the QDU attending physician rather than independent researchers distributed the questionnaires may have affected the results. Studies have shown that, although asking questions in search of feedback just after the consultation has the advantage of obtaining actual time awareness, respondents tend to report more satisfaction. In contrast, although soliciting opinion excessively long after a care episode may imply that patients have forgotten relevant facts, they seem more likely to express their actual opinion when they have more time to ponder the consultation, hence tending to report less satisfaction when the questionnaire is fulfilled at home [29, 43, 63]. Anyway, a recent study concluded that there is insufficient research comparing the advantages and disadvantages of different timeframes for acquiring feedback about satisfaction or patient experience [28]. Second, the study was undertaken in a single center. Yet, according to published reports on Spanish QDUs, our patients are representative of those evaluated in other units [24]. Third, providing concurrent survey data from hospitalized patients in the same hospital for the purposes of comparison would have been desirable. Nevertheless, we intend to repeat the survey in the near future with a larger sample of QDU patients as well as to expand our investigation to include hospitalized patients. In fact, we are currently testing and validating a similar questionnaire adapted for patients who are hospitalized for diagnostic workup. Finally, our questionnaire evaluated patient perception/opinions of quality of care including recommendation rather than satisfaction. Although most questionnaires have focused on satisfaction rather than opinions about quality of care, some experts argue that the latter is a more valuable approach [26]. While perceived quality of care does not need to be expressed in terms of satisfaction [64], evaluation of satisfaction does not need to unavoidably contemplate patient opinion or views about quality of care [65]. Furthermore, besides involving a highly affective dimension [66], satisfaction seems more dependent on patient expectations than is perception of quality [67, 68].

## Conclusion

Although completion of the questionnaire after the consultation and its delivery by the QDU attending physician might have resulted in overestimation, this study shows that patients suspected of suffering a potentially severe disease attending a Spanish QDU of a third-level university hospital reported a high perception of the quality of care including waiting times, physical environment, accessibility, clinical information, personal interaction, and recommendation. Remarkably, patients' willingness to recommend the Unit was high with a mean score of 9.5 in a visual analogue scale ranging from 0 ('never') to 10 ('without a doubt'). However, multivariate linear regression analysis revealed significant differences in mean scores of several subscales with regard to patient age, education level, number of QDU visits, and a diagnosis of malignant vs. benign condition, after due adjustment. Although age older than 65 years was an independent predictor of higher clinical information, personal interaction and recommendation scores, an age of 18–44 years was associated with lower mean scores in these subscales. Furthermore, although lower education was an independent predictor of higher clinical information and recommendation scores, university education was strongly associated with lower scores in these subscales. In addition, having ≥4 QDU visits was a negative predictor of time to diagnosis and recommendation scores, likely reflecting the longer time to diagnosis of patients having more visits. Finally, malignancy was a negative predictor of time to diagnosis, clinical information, and recommendation scores. This association may

be partly explained by the longer time to diagnosis of patients diagnosed with malignancy and perhaps, although not analyzed, by a worse physical health status related to their condition together with the higher anguish induced by the communication of the diagnosis at the last visit.

## Additional file

**Additional file 1: Questionnaire Form.** Validated satisfaction questionnaire of patients evaluated in the quick diagnosis unit. (DOCX 28 kb)

### Abbreviations

ANOVA: Analysis of variance; *B*: Regression coefficient beta; CI: Confidence intervals; ED: Emergency department; PCC: Primary healthcare center; QDU: Quick diagnosis unit; SD: Standard deviation..

### Competing interests

The authors declare that they have no competing interests.

### Authors' contributions

CSA, AS, CC, AGR, BRH, and XC participated in the design of the study. CSA and XB collected the data and undertook the analysis. CSA and XB undertook the literature review and wrote the first draft. All authors contributed to further drafts, fulfill all 4 ICMJE authorship criteria and all approved the final version.

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**COST-MINIMIZATION ANALYSIS FAVORS OUTPATIENT QUICK DIAGNOSIS UNIT OVER HOSPITALIZATION FOR THE DIAGNOSIS OF POTENTIALLY SERIOUS DISEASES**

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**ABSTRACT**

**Background** Quick diagnosis units (QDUs) are a promising alternative to conventional hospitalization for the diagnosis of suspected serious diseases, most commonly cancer and severe anemia. Although QDUs are as effective as hospitalization in reaching a timely diagnosis, a full economic evaluation comparing both approaches has not been reported.

**Aims** To evaluate the costs of QDU *vs.* conventional hospitalization for the diagnosis of cancer and anemia using a cost-minimization analysis on the proven assumption that health outcomes of both approaches were equivalent.

**Methods** Patients referred to the QDU of Bellvitge University Hospital of Barcelona over 51 months with a final diagnosis of severe anemia (unrelated to malignancy), lymphoma, and lung cancer were compared with patients hospitalized for workup with the same diagnoses. The total cost per patient until diagnosis was analyzed. Direct and indirect costs of QDU and hospitalization were compared.

**Results** Time to diagnosis in QDU patients (n=195) and length-of-stay in hospitalized patients (n=237) were equivalent. There were considerable costs savings from hospitalization. Highest savings for the three groups were related to fixed direct costs of hospital stays (66% of total savings). Savings related to fixed indirect costs of structural and general functioning were 33% of total savings. Savings related to variable direct costs of investigations were 1% of total savings. Overall savings from hospitalization of all patients were €867,719.31.

**Conclusion** QDUs appear to be a cost-effective resource for avoiding unnecessary hospitalization in patients with anemia and cancer. Internists, hospital executives, and healthcare authorities should consider establishing this model elsewhere.

**Keywords** Quick diagnosis units; Conventional hospitalization; Cost-minimization analysis; Costs savings

## INTRODUCTION

Although Spaniards have been traditionally proud of their public health system, as revealed by national surveys, the economic recession has had severe consequences not only for the country healthcare system but also, in some cases, for health outcomes [1,2]. Yet the crisis provided a unique opportunity to analyze the shortfalls of the system. In addition to the accumulated structural and financial debts, the healthcare system is currently threatened by other factors such as an aging population, the increase of chronic diseases and co-morbidity, the overuse of diagnostic tests, or the excessive medicalization [2-4]. While many healthcare models worldwide (including the Spanish model) still remain slanted toward acute inpatient care, there is a general agreement by which the focus should shift on to avoid unnecessary admissions by the reinforcement of community- and outpatient-based care services instead of the most expensive use of acute beds and hospitalizations [4,5]. Indeed, hospitalizations ― and inpatient length of stay (LOS) ― are the foremost component of healthcare costs in numerous countries [3,5,6].

One way to reduce hospitalization-related costs is the prevention of inpatient admissions ― and readmissions ― through proper management in the primary care setting [5,7,8]. Yet pragmatic ways to reduce hospitalization costs include a simple decrease in the number of total inpatient beds, the reduction of inpatient admissions, or the reduction of inpatient mean LOS, as reported in several European countries and the USA during the last decade [8-10]. Therefore, increasing the use of alternative models to conventional hospitalization may be a significant cost saving measure. Indeed, some ambulatory approaches for treatment and follow-up including day centers [11,12] and hospitals at home [13-15] have been found to reduce costs while maintaining standards of care [4]. Less is known about the economic impact of alternatives for the diagnostic approach of suspected serious diseases in the outpatient care. Certainly, even though Spain has not used the crisis as an opportunity for deeply rationalizing, reorganizing, and restructuring its public healthcare services [2,3], there have been some remarkable local exceptions, best exemplified by efforts to avoid unnecessary inpatient admissions through the so-called 'Quick Diagnosis Units' (QDUs), an increasingly recognized outpatient alternative to conventional hospitalization for the diagnosis of a number of suspected serious diseases [16-18].

The rationale for the creation of QDUs was the understanding that some patients with potentially serious diseases, especially cancer, are still hospitalized in acute beds only for diagnostic workup but without receiving actual treatment [16,18]. Despite most of these patients have a

grounded suspicion of a serious disease, they are commonly not severely ill and hospitalization usually responds to the need for ensuring a rapid diagnosis, as there is a permanent blockage for a quick outpatient workup access. As a matter of example, because of the considerable delays in gaining access to diagnostic testing in primary care centers (PCCs), PCC physicians tend to refer patients with potentially severe disorders to the emergency department (ED), were they are commonly hospitalized to speed-up investigations [17]. However, while using the ED as a timesaving alternative to delayed diagnostic referrals only contributes to ED overcrowding [19], these unnecessary admissions become at the same time a dangerous barrier to the inpatient access of other seriously sick patients who actually need hospitalization and treatment, reflecting a larger failure of hospital-wide patient flow. The long-standing, illogical, tradition of Spanish public hospitals of prioritizing inpatients for tests such as computed tomography, magnetic resonance imaging, endoscopies, or biopsies only contributes to perpetuating this situation [16,20,21]. Therefore, QDUs emerged as an appropriate — and, in turn, less expensive — approach allowing for a prompt outpatient workup, with minimal disruption of daily life, in such patients with suspected important disorders [4,18].

In the Spanish healthcare system, approximately 17% of patients admitted to internal medicine units may be studied on an outpatient basis [4,22,23]. A recent Spanish study using the Appropriateness Evaluation Protocol (AEP) showed that 9% of patients admitted to the internal medicine department of a university hospital corresponded to inappropriate admissions and that 23% of inpatient stays were inappropriate [22]. Of note, the first identified cause of inappropriate admission or stay was 'patient awaiting tests that can be done on an outpatient basis' [22]. The situation may be very similar in other countries. A UK study reported that 28% of emergency medical admissions to a public hospital were, according to AEP, inappropriate, most commonly (64%) owing to diagnostic tests or treatments that could have been performed on an outpatient care setting [24].

Normally led by internists, hospital-based QDUs are thus a distinct model of outpatient care delivery, which have almost exclusively been reported in Spain, most notably in Catalonia [18,25-28]. Several studies have shown that cancer is the commonest diagnosis in patients evaluated in QDUs. Likewise, the main reason for hospitalization for workup in Spain is suspicion of cancer [4,18,21,25-29]. Anemia is also a common diagnosis in Catalan QDUs and a frequent motive for inpatient admission for intensive diagnostic study [26,27,30]. The driving reason explaining the important role of internists leading QDUs is the common presence of nonspecific symptoms such as weight loss, fatigue, malaise or fever of unknown origin in patients referred to these units. The versatility of these physicians for the diagnosis of a wide range of serious disorders together with their integral, global view of the patient [20,21,29-31] contrast with the more specialized approach of physicians at other units such as the UK one-stop diagnostic clinics [32].

Although reported data on QDUs are limited to date, this model of care delivery has proven to successfully avoid unnecessary hospitalizations and inappropriate referrals from PCs to ED, leading to a greater patient satisfaction than conventional admission [17,18,25,26,29,30,33]. Moreover, previous studies conducted by two Catalan teams showed that QDUs were equally effective as conventional hospitalization in reaching a timely diagnosis in patients with suspected serious medical disorders [17,26,29,30]. However, none of these studies reported an actual full economic evaluation comparing both approaches.

The purpose of this cost-minimization analysis was to assess the costs of the QDU approach compared with the costs of conventional hospitalization for the diagnosis of cancer and severe anemia in a population of adult patients attended in a tertiary care university hospital setting.

## MATERIALS AND METHODS

In this cost-minimization study, we analyzed the costs of QDU (intervention) compared with the estimated potential costs of conventional hospitalization (usual approach). The analysis was based on the clinical evidence-based assumption that patient outcomes were equivalent whether delivered by hospitalization or QDU.

***The QDU at Bellvitge University Hospital***

The QDU is integrated to the Internal Medicine Department of the Bellvitge University Hospital, a tertiary public hospital affiliated to the University of Barcelona, Catalonia, Spain. It has 750 acute beds serving as a tertiary care referral center for more than 2 million people. Similar to other internist-led QDUs [18,25,26], the requirements for evaluation by the QDU at Bellvitge Hospital are: 1) clear referral criteria based on a pre-established list of suspected serious disorders; 2) the first visit has to occur as soon as possible after referral (≤15 days); 3) patients must have preferential access to a wide range of diagnostic tests; and 4) patients should be able to attend several appointments for outpatient visits and diagnostic tests. The QDU is open 7 hours a day, 2 days a week (Tuesdays and Fridays).

***Study subjects***

Medical records were retrieved from the institutional QDU database to identify the patient groups of interest. In order to compare homogeneous populations, three paradigmatic groups of QDU patients were selected. Patients referred to the QDU who had a final diagnosis of severe anemia (unrelated to malignancy), lymphoma, and lung cancer were included. These patients were selected out of a consecutive series of patients referred to the unit between March 2008 and June 2012. In this former descriptive study [33], QDU referral criteria were similar to those of other reported QDU studies [16,17,26-28], with malignancy and anemia being the most common final diagnoses. All patients were referred by physicians from the ED of the Bellvitge Hospital and PCC physicians attending patients from the hospital geographical area.

For the purpose of the current economic study, the three groups of QDU patients were compared with patients who were electively hospitalized at the Internal Medicine Department of the hospital for diagnostic workup during the same period and who had the same final diagnoses. The ethics research committee of the Bellvitge Hospital approved the study.

For hospitalized patients, the Minimum Basic Data Set (MBDS) [34], complemented with regular clinical practice variables provided by the Internal Medicine Department, was used. The system uses the codes of the Spanish version of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) [35].

***Cost-minimization analysis***

The actual costs of QDU patients were compared with the estimated potential costs of patients admitted for hospitalization. As reported elsewhere [4,8,18,25-30], mean time to diagnosis for QDU and mean LOS for hospitalization were considered to be the most significant health outcome

and they were found to be equivalent whether the diagnosis had been reached via QDU or inpatient admission (see later).

The primary cost variable analyzed was the total cost per patient until reaching a diagnosis, which was calculated from the sum of personnel, medical material, diagnostic tests, therapeutic procedures, structural and general functioning costs, and depreciation. Specifically, the direct and indirect costs of the QDU and hospitalization approaches were calculated. The direct costs of QDU included 1) personnel, 2) medical material, 3) diagnostic investigations, and 4) therapeutic procedures. Direct costs of QDU personnel were calculated for all the staff working part or full time in the unit, and included the attending physician (fraction of salary equivalent to 30 minutes per first visit and 15 minutes per each successive visit), a registered nurse (50% of full time), and a caretaker (10% of full time). Indirect costs of QDU were mostly structural and general functioning costs including, among others, administrative costs, costs related to maintenance, laundry, and cleaning services, as well as consultation costs. There were also personnel, medical material, and therapeutic procedures' indirect costs associated with QDU. The estimated direct costs of hospitalization included 1) the cost of hospital stays, which intrinsically and predominantly comprises personnel (but only nursing and caretaker staff), medical material, and therapeutic procedures, 2) the cost of physicians including the attending physician and the resident physician (fraction of salary equivalent to 30 minutes per day), and 3) the cost of diagnostic investigations. The estimated indirect costs of hospitalization were the same as the QDU indirect costs, namely, structural and general functioning costs excluding consultation costs. There were also personnel (attending and resident physicians) indirect costs associated with hospitalization.

Cost data were obtained from the institutional information system implemented in the Bellvitge Hospital, supplemented with information provided by the Department of Economics (e.g. disease-related groups), and fees of the Catalan Health Service (CHS). In the analysis of QDU costs, unit costs for each type of diagnostic investigation and for an average outpatient consultation were calculated according to officially established CHS fees. The estimated potential costs of the hospitalization approach were partly determined according to the information provided by the MBDS. The cost of a hospital stay was based on an analytical cost performed internally by the Department of Economics of the Bellvitge Hospital and was based on admission in standard wards. In addition, we computed the average of the unit costs for diagnostic tests in the hospitalization approach, which were based on the same unit costs of the QDU. Depreciation of fixed hospital costs was also included in the final analysis. All costs were adjusted to the corresponding year (i.e. from 2008 to 2012) and were measured in Euros (€).

Calculations were performed using Microsoft Excel 2013 (v15.0).

**RESULTS**

As described elsewhere [33], patients were selected out of a total sample of 1,226 consecutive patients referred to the QDU over a 51-month period. Specifically, 195 patients referred to the QDU who had a final diagnosis of severe anemia ― unrelated to malignancy ― (n=94), lymphoma (n=63), and lung cancer (n=38) were included. For the three diagnostic groups, the overall average time to diagnosis was 11.1 days, with a total of 195 first visits and 137 successive visits. For comparison using a cost-minimization method, 237 patients admitted to the Internal Medicine Department of Bellvitge Hospital during the same study period and who had a final diagnosis of severe anemia ― unrelated to malignancy ― (n=109), lymphoma (n=65), and lung cancer (n=63) were analyzed. The overall average LOS of these inpatients was 10.3 days, hence indicating no difference in the primary clinical outcome of the study.

The mean direct and indirect costs per patient for both QDU and hospitalization over the 51 month period and the mean cost saving per patient and for all the patients included in the diagnostic groups of anemia, lymphoma, and lung cancer are reported in Tables 1, 2, and 3.

Mean estimated cost savings from hospitalization were remarkable across the three groups. There were no significant differences in cost saving per patient according to each final diagnosis: mean cost saving per patient with a diagnosis of anemia was €4,422.91, while it was €4,481.41 per patient with a diagnosis of lymphoma, and €4,464.13 per patient with a diagnosis of lung cancer. Probably because of the higher number of patients with anemia, the highest overall savings were observed in this group (€415,753.54 for all patients with anemia), while the overall saving for all patients with lymphoma was €282,328.83 and it was €169,636.94 for all patients with lung cancer.

Greatest savings of specific cost items in all diagnostic groups were related to hospital stays. Taking into account the mean LOS and the mean cost per hospital stay, the mean cost saving per patient for this item was €2,956.41. Overall, the mean estimated saving per patient for the three diagnostic groups related to the costs of hospital stays represented 66% of the total cost savings per patient. Structural and general functioning costs also generated significant QDU savings from hospitalization. Overall, the mean estimated saving per patient for the three diagnostic groups related to the structural and general functioning costs of hospitalization was €1,485.84, ranging from €1,474.76 to €1,494.26 depending on the diagnosis, which represented 33% of the total cost savings per patient.

The estimated QDU savings from hospitalization associated with the costs of diagnostic investigations were lower. The mean cost saving per patient for this item across the three diagnostic groups ranged from €19.25 in patients with anemia to €46.73 in patients with lung cancer to €58.25 in those with lymphoma. Overall, the mean QDU saving per patient for the three groups related to the costs of diagnostic investigations was only 1% of the total cost savings per patient. These findings suggested that, to reach a specific diagnosis of anemia, lung cancer, and lymphoma in equivalent waiting times (i.e. time to diagnosis/LOS), the attending physician at the QDU ordered slightly fewer diagnostic tests than the two physicians assigned to every patient at the Internal Medicine Department (i.e. one attending physician and one resident physician). As shown in Tables 4, 5, and 6, physicians at the Internal Medicine Department ordered more blood and urine tests than the QDU attending physician did. Overall, for the three groups, the mean cost of blood and urine analysis per patient was 26% of the total costs of diagnostic investigations per patient in the QDU, and an estimated 33% of the total costs of diagnostic investigations per patient in hospitalization (Tables 4-6).

Taking into account the full sample of patients evaluated in the QDU (n=195), the total combined cost savings from hospitalization were estimated at €867,719.31.

**DISCUSSION**

Acute inpatient beds or conventional hospitalization is the most expensive resource of the Spanish care system, resembling public and private health systems of other developed countries including the USA [2-6,8-10,18,36-40]. To avoid unnecessary and costly inpatient admissions, internists-led QDUs have been rapidly established in Catalonia in recent years, meaning that most Catalan tertiary public hospitals with a reference population of 350,000-600,000 and over 50% of district hospitals with a reference population of $\leq$ 350,000 have now QDUs. To our knowledge, the current study is the first reported investigation that has evaluated the economic impact of the new QDU approach in comparison with conventional hospitalization by using a cost-minimization analysis.

Results showed a significant cost saving of care delivered by a QDU service compared with traditional inpatient care. The QDU savings from hospitalization were mainly related to the significant reduction of fixed costs, which included direct costs of hospital stays — making nearly two-thirds of overall savings — and indirect costs of structural and general functioning — making about one-third of overall savings. Much less important were the QDU savings related to the hospital direct costs of diagnostic investigations.

Current international health policies tend to rationalize the use of health services in terms of safety, efficacy, effectiveness, efficiency, equity, social benefit, and cost suitability based on the best

full economic evaluation. Economic evaluation involves identifying, measuring, and valuing both the inputs (costs) and the outcomes (benefits) of the intervention. The four main methods of economic healthcare evaluation have traditionally comprised cost-minimization, cost-effectiveness, cost-utility, and cost-benefit analyses [41,42]. Cost-minimization analysis has traditionally been considered a form of full economic evaluation intended for identifying the lowest cost alternative [42]. Although the cost-minimization method has been perceived as the easiest to apply, such perception is misleading [43]. Particularly, to be a valid and reliable approach to decision-making, recent studies have cautioned that the resulting health outcomes of the programs evaluated by this form of analysis should be identical or equivalent and supported by high quality clinical evidence. Accordingly, verification that primary and any secondary outcomes are clinically equivalent is mandatory to legitimize the use of this technique [41-43].

In this study, the clinical benefits of QDU *vs*. conventional hospitalization for similar patient populations were equivalent. Recent studies comparing both approaches for the diagnosis of patients with anemia and cancer (including lung cancer and lymphoma) revealed that differences between the mean time to diagnosis, which is the leading objective and expected benefit of the QDU model, and the mean LOS were not significant (NS) [17,26,29,30]. Specifically, a 4-year study published in 2013 by Bosch *et al* from the Hospital Clínic (HC), a tertiary university institution in Barcelona (Catalonia, Spain) showed that mean time to diagnosis in QDU *vs.* mean LOS was 7.9 *vs.* 8.9 days in anemia (NS), 7.9 *vs.* 8.0 days in lung cancer (NS), and 8.0 *vs.* 8.0 days in lymphoma (NS), respectively [17]. Moreover, in a 5-year prospective study of patients evaluated in another internist-led Catalan QDU at the district Granollers General Hospital (GGH), Capell *et al* observed that mean time to diagnosis in QDU *vs.* mean LOS in lung cancer patients was 8.5 *vs.* 9.1 days (NS), respectively [26]. In the current study, average time to diagnosis of QDU patients with anemia, lymphoma, and lung cancer was 11.1 days, thus not significantly different from average LOS of hospitalized patients with these diagnoses (10.3 days).

Secondary clinical outcomes of the above-mentioned QDU studies from HC [17,44] and GGH [26] were also similar when compared with the secondary outcomes reported by our group in an earlier study conducted at the QDU of Bellvitge University Hospital (BUH) [33]. These outcomes included, among others, appropriateness of QDU referrals (HC 96%, GGH 84%, and BUH 89%), mean inpatient bed-days saved per patient (HC 8.8, GGH 7, and BUH 7), proportion of patients preferring QDU over hospitalization (HC 88%, GGH 80%, and BUH 96%), and unplanned hospitalizations (HC 3%, GGH 7%, and BUH 5%).

While HC, GGH, and BUH studies have therefore reported similar clinical efficacy outcomes, Bosch *et al* from HC [29,30] and Capell *et al* from GGH [26] additionally found significant cost savings of QDU *vs.* inpatient admission in patients with cancer and anemia. The savings calculated by

these investigators were analyzed by microcosting methods in HC studies by Bosch *et al* [29,30] and by an *ad hoc* method in GGH study by Capell *et al* [26]. While items comprising direct and indirect costs in these studies were similar to the items used in the current study, costs of hospital stays did not inherently encompass personnel, medical material, and therapeutic procedures costs. Rather, these costs were first calculated individually, then proportionally applied to one hospital stay [26,29,30]. Furthermore, unlike the current study, direct costs of diagnostic investigations in HC studies by Bosch *et al* were not based on CHS fees but on the own hospital tariffs, which were significantly higher [29,30]. On the other hand, costs of investigations were excluded from the GGH analysis by Capell *et al* since they were considered to be equal for both QDU and hospitalization [26]. In cancer and anemia, Bosch *et al* found an average cost saving of €3,457.53 [29] and €15,357.4 [30] per patient, respectively. Moreover, Capell *et al* reported an average cost saving of €427.8 per lung cancer patient [26]. Similar to the present study, GGH Capell *et al* study showed that QDU savings from hospitalization in patients with lung cancer were mainly due to the fixed costs related to personnel salaries and structural and general functioning costs [26]. In HC Bosch et *al* studies in cancer patients, QDU savings from hospitalization were largely attributed to the fixed costs related to personnel salaries, followed by the variable costs related to diagnostic investigations, and, to a lesser degree, fixed structural and general functioning costs [29]. However, the remarkable total cost differences between QDU (€2,920.62) and hospitalization (€18,278.01) in patients with anemia owed essentially to the highly different variable costs incurred by blood transfusions [30].

A recently published systematic review of internists-led QDUs conducted by US investigators found that the studies by Bosch *et al* and Capell *et al* were the only reported investigations that included a cost comparison between QDU and conventional inpatient evaluation [18]. Authors of this review mentioned that fixed costs and certain variable costs such as procedures and medications are significantly lower in Europe than in the USA. Commenting on the current emphasis on value-based care, these authors stressed the need for optimizing the efficiency of the US healthcare delivery system and argued that the QDUs model may represent, even in the USA, a promising source of potential savings by avoiding the high cost of inpatient admissions for merely diagnostic purposes [18].

The study has some limitations that preclude a generalization of its results. First, a formal sensitivity analysis was not conducted; yet even reducing structural/general functioning costs by 50% would have a minimal impact on the overall findings of the cost analysis (data not shown). Second, the number of QDU patients with lung cancer included was low, reflecting the existence of specialized units managing this common malignancy (e.g. lung cancer day centers) [25,29,33]. Finally, the study was a single institution study. Nevertheless, our group is currently involved in a multicenter investigation underway in the two QDUs with the largest reference populations of Catalonia (i.e.

QDUs of Bellvitge University Hospital and Hospital Clínic) including more diagnostic groups and rigorous sensitivity analyses. We strongly believe that such a new investigation may permit to draw more firm conclusions about the actual economic benefits of QDUs in Spanish public hospitals, with recommendations for their generalized use and even potential ramifications for other healthcare systems and settings.

**CONCLUSION**

This study has revealed that, compared to traditional inpatient admission, QDU is a cost saving approach for the diagnostic workup of patients with either cancer suspicion or severe anemia, two of the most common disorders referred for evaluation at QDUs in Catalonia. Average time to diagnosis of QDU patients with anemia, lymphoma, and lung cancer was not significantly different from average LOS of patients hospitalized for workup with the same diagnoses. In addition to the recognized clinical efficacy of QDUs compared with standard hospitalization, the savings observed in this investigation using a cost-minimization analysis appear to confirm that QDUs are also a cost-effective resource for avoiding unnecessary inpatient admissions in patients who are able to return for outpatient evaluation. Now the challenge is to replicate these findings in larger studies in order to encourage other internists, hospital executives, and healthcare policymakers to disseminate the QDU model elsewhere.

**CONFLICT OF INTEREST STATEMENT**

We declare that we have no conflicts of interest with regard to the above manuscript.

**FUNDING**

None

**LEARNING POINTS**

Although outpatient hospital-based quick diagnosis units (QDUs) are as effective as conventional hospitalization in reaching a timely diagnosis, a full economic evaluation comparing both approaches has not been reported.

The primary health outcome of the QDU and hospitalization approaches evaluated by cost-minimization analysis (mean time to diagnosis and mean length of stay, respectively) was equivalent and supported by reported clinical evidence.

There were considerable costs savings from hospitalization in all diagnostic groups, and the highest savings were related to fixed direct costs of hospital stays (66% of total savings per patient).

Cost savings related to fixed indirect costs of structural and general functioning of hospitalization were also notable (33% of total savings per patient).

While QDUs thus appear to be a cost-effective resource for avoiding unnecessary hospitalization in patients with anemia and cancer, larger, multicenter studies are needed to confirm these results and encourage other internists, hospital executives, and healthcare policymakers to disseminate the QDU model elsewhere.

**Table 1**. Mean costs and savings per patient and overall savings in anemia unrelated to malignancy (n=94)

| | **Hospitalization** | | **QDU** | | **Difference** |
|---|---|---|---|---|---|
| | **Cost** | **Total** | **Cost** | **Total** | |
| **Personnel** (with quotas) | | 199.50 | | 219.06 | 19.56 |
| Attending physicians | 135.49 | | 101.74 | | |
| Resident physicians | 54.53 | | 0.00 | | |
| Nursing staff * | 0.00 | | 93.00 | | |
| Caretaker staff * | 0.00 | | 9.99 | | |
| Indirect costs of personnel | 9.48 | | 14.33 | | |
| **Medical supplies** * | | 0.00 | | 7.39 | 7.39 |
| Medical material | 0.00 | | 6.97 | | |
| Indirect costs | 0.00 | | 0.42 | | |
| **Therapeutic procedures** * | | 0.00 | | 0.56 | 0.56 |
| Pharmaceuticals and consumables | 0.00 | | 0.53 | | |
| Indirect costs | 0.00 | | 0.03 | | |
| **Diagnostic investigations** † | | 217.13 | | 197.88 | -19.25 |
| **Hospital stays** | | 2,956.41 | | 0.00 | -2,956.41 |
| Length of stay | 10.3 | | 0.00 | | |
| Cost per stay | 287.03 | | 0.00 | | |
| **Depreciation** | | 15.41 | | 15.41 | 0.00 |
| **Structural/general functioning costs** | | 1,686.92 | | 212.16 ‡ | -1,474.76 |
| | | | | | |
| **Total cost per patient** | | 5,075.37 | | 652.46 | -4,422.91 |
| **Overall cost** (n=94) | | 477,084.78 | | 61,331.24 | |
| **Overall saving** (n=94) | | | | | -415,753.54 |

* Included in the cost of a hospital stay
† See Table 4
‡ Includes QDU consultation costs
QDU, quick diagnosis unit

**Table 2**. Mean costs and savings per patient and overall savings in lymphoma (n=63)

| | **Hospitalization** | | **QDU** | | **Difference** |
|---|---|---|---|---|---|
| | **Cost** | **Total** | **Cost** | **Total** | |
| **Personnel** (with quotas) | | 199.50 | | 219.06 | 19.56 |
| Attending physicians | 135.49 | | 101.74 | | |
| Resident physicians | 54.53 | | 0.00 | | |
| Nursing staff ***** | 0.00 | | 93.00 | | |
| Caretaker staff ***** | 0.00 | | 9.99 | | |
| Indirect costs of personnel | 9.48 | | 14.33 | | |
| **Medical supplies *** | | 0.00 | | 7.39 | 7.39 |
| Medical material | 0.00 | | 6.97 | | |
| Indirect costs | 0.00 | | 0.42 | | |
| **Therapeutic procedures *** | | 0.00 | | 0.56 | 0.56 |
| Pharmaceuticals and consumables | 0.00 | | 0.53 | | |
| Indirect costs | 0.00 | | 0.03 | | |
| **Diagnostic investigations** † | | 471.83 | | 413.58 | -58.25 |
| **Hospital stays** | | 2,956.41 | | 0.00 | -2,956.41 |
| Length of stay | 10.3 | | 0.00 | | |
| Cost per stay | 287.03 | | 0.00 | | |
| **Depreciation** | | 15.41 | | 15.41 | 0.00 |
| **Structural/general functioning costs** | | 1,814.27 | | 320.01 ‡ | -1,494.26 |
| | | | | | |
| **Total cost per patient** | | 5,457.42 | | 976.01 | -4,481.41 |
| **Overall cost** (n=63) | | 343,817.46 | | 61,488.63 | |
| **Overall saving** (n=63) | | | | | -282,328.83 |

***** Included in the cost of a hospital stay
† See Table 5
‡ Includes QDU consultation costs
QDU, quick diagnosis unit

**Table 3**. Mean costs and savings per patient and overall savings in lung cancer (n=38)

| | **Hospitalization** | | **QDU** | | **Difference** |
|---|---|---|---|---|---|
| | **Cost** | **Total** | **Cost** | **Total** | |
| **Personnel** (with quotas) | | 199.50 | | 219.06 | 19.56 |
| Attending physicians | 135.49 | | 101.74 | | |
| Resident physicians | 54.53 | | 0.00 | | |
| Nursing staff * | 0.00 | | 93.00 | | |
| Caretaker staff * | 0.00 | | 9.99 | | |
| Indirect costs of personnel | 9.48 | | 14.33 | | |
| **Medical supplies** * | | 0.00 | | 7.39 | 7.39 |
| Medical material | 0.00 | | 6.97 | | |
| Indirect costs | 0.00 | | 0.42 | | |
| **Therapeutic procedures** * | | 0.00 | | 0.56 | 0.56 |
| Pharmaceuticals and consumables | 0.00 | | 0.53 | | |
| Indirect costs | 0.00 | | 0.03 | | |
| **Diagnostic investigations** † | | 496.83 | | 450.10 | -46.73 |
| **Hospital stays** | | 2,956.41 | | 0.00 | -2,956.41 |
| Length of stay | 10.3 | | 0.00 | | |
| Cost per stay | 287.03 | | 0.00 | | |
| **Depreciation** | | 15.41 | | 15.41 | 0.00 |
| **Structural/general functioning costs** | | 1,826.77 | | 338.27 ‡ | -1,488.50 |
| | | | | | |
| **Total cost per patient** | | 5,494.92 | | 1,030.79 | -4,464.13 |
| **Overall cost** (n=38) | | 208,806.96 | | 39,170.02 | |
| **Overall saving** (n=38) | | | | | -169,636.94 |

* Salaries and costs included in the cost of a hospital stay
† See Table 6
‡ Includes QDU consultation costs
QDU, quick diagnosis unit

**Table 4.** Selected unit costs related to diagnostic investigations in anemia (n=94)

| | **Unit cost *** | **Hospitalization** | **QDU** |
|---|---|---|---|
| Blood and urine analysis | 96.33 | 95.91 | 78.64 |
| Esophagogastroduodenoscopy | 33 | 10.78 | 10.60 |
| Colonoscopy | 150 | 46.36 | 45.60 |
| Specialist consultation | 143 | 5.05 | 4.97 |
| Ultrasonography | 60 | 5.30 | 5.21 |
| Blood marrow aspiration | 33.9 | 5.39 | 5.30 |
| Lower gastrointestinal series | 41 | 7.24 | 7.12 |
| Upper gastrointestinal series | 41 | 6.15 | 6.05 |
| X-ray CT | 92 | 11.37 | 11.19 |
| Electrocardiography | 18 | 2.23 | 2.19 |
| Simple X-ray | 9 | 0.87 | 0.86 |
| PET-CT | 836 | 14.76 | 14.52 |

Total cost per patient in internal medicine ward=€217.13
Total cost per patient in QDU=€197.88
* According to Catalan Health Service fees
QDU, quick diagnosis unit; CT, computed tomography; PET-CT, positron emission tomography-computed tomography

**Table 5.** Selected unit costs related to diagnostic investigations in lymphoma (n=63)

| | **Unit cost *** | **Hospitalization** | **QDU** |
|---|---|---|---|
| Blood and urine analysis | 96.33 | 137.65 | 84.49 |
| Specialist consultation | 143 | 46.50 | 45.79 |
| Ultrasonography | 60 | 8.48 | 8.35 |
| X-ray CT | 92 | 26.01 | 25.62 |
| Simple X-ray | 9 | 1.65 | 1.63 |
| PET-CT | 836 | 212.74 | 209.49 |
| Cytology † | 6 | 5.51 | 5.43 |
| Biopsy | 21 | 4.75 | 4.68 |
| Flow cytometry | 126 | 10.69 | 10.52 |
| Colonoscopy | 150 | 8.48 | 8.35 |

Total cost per patient in internal medicine ward=€471.83
Total cost per patient in QDU=€413.58
* According to Catalan Health Service fees
† Includes fine needle aspiration cytology
QDU, quick diagnosis unit; CT, computed tomography; PET-CT, positron emission tomography-computed tomography

**Table 6.** Selected unit costs related to diagnostic investigations in lung cancer (n=38)

| | **Unit cost *** | **Hospitalization** | **QDU** |
|---|---|---|---|
| Blood and urine analysis | 96.33 | 122.52 | 78.59 |
| Specialist consultation | 143 | 32.81 | 33.77 |
| X-ray CT | 92 | 21.11 | 21.73 |
| Simple X-ray | 9 | 1.88 | 1.93 |
| PET-CT | 836 | 261.60 | 269.23 |
| Biopsy | 21 | 1.75 | 1.80 |
| Bronchoscopy | 27 | 3.38 | 3.48 |
| Cytology | 6 | 2.88 | 2.96 |
| Microbial culture | 17.2 | 1.08 | 1.11 |
| Scintigraphy | 78 | 9.76 | 10.05 |
| Mammography | 24 | 1.00 | 1.03 |

Total cost per patient in internal medicine ward=€496.83
Total cost per patient in QDU=€450.10
* According to Catalan Health Service fees
QDU, quick diagnosis unit; CT, computed tomography; PET-CT, positron emission tomography-computed tomography

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