

SPANISH ASSOCIATION OF PAEDIATRICS

## An update of the diagnostic coding system by the Spanish Society of Pediatric Emergencies<sup>☆</sup>



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Received 18 November 2014; accepted 23 December 2014

Available online 17 June 2015

### KEYWORDS

Diagnostic codes;  
Paediatric  
emergencies;  
Spanish Society of  
Pediatric  
Emergencies

**Abstract** The Quality Working Group of the Spanish Society of Pediatric Emergencies (SEUP) presents an update of the diagnostic coding list. The original list was prepared and published in *Anales de Pediatría* in 2000 based on the ICD-9-CM International Coding system at that time. Following the same methodology used at that time and based on the 2014 edition of the ICD-9-CM, 35 new codes have been added to the list, 15 have been updated, and a list of the most frequent references to trauma diagnoses in paediatrics have been provided. In the current list of diagnoses, SEUP reflects the significant changes that have taken place in Paediatric Emergency Services in the last decade.

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<sup>☆</sup> Please cite this article as: Benito Fernández J, Luaces Cubells C, Gelabert Colomé G, Anso Borda I, Grupo de Trabajo de Calidad de la Sociedad Española de Urgencias de Pediatría (SEUP). Actualización del sistema de codificación diagnóstica de la Sociedad Española de Urgencias de Pediatría. *An Pediatr (Barc)*. 2015;82:442.e1–442.e7.

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◇ Los miembros del Grupo de Trabajo se presentan en el anexo 1.

**PALABRAS CLAVE**

Códigos de diagnóstico;  
Urgencias de pediatría;  
Sociedad Española de Urgencias de Pediatría

## Actualización del sistema de codificación diagnóstica de la Sociedad Española de Urgencias de Pediatría

**Resumen** Se presenta la actualización del listado de codificación diagnóstica de la Sociedad Española de Urgencias de Pediatría (SEUP) que ha realizado el Grupo de Trabajo de Calidad de dicha Sociedad. El listado original fue elaborado y publicado en Anales de Pediatría el año 2000, basándose en la edición existente en aquel momento del sistema de codificación internacional CIE-9-MC. Siguiendo la misma metodología utilizada en aquel momento, y basándose en la edición del año 2014 del CIE-9-MC, se han añadido el listado 35 nuevos códigos, se han actualizado 15 y se ha añadido un listado de referencia con los diagnósticos traumatológicos más frecuentes en pediatría. El listado de diagnósticos SEUP actual refleja los importantes cambios experimentados por los Servicios de Urgencia Pediátricos en el último decenio.

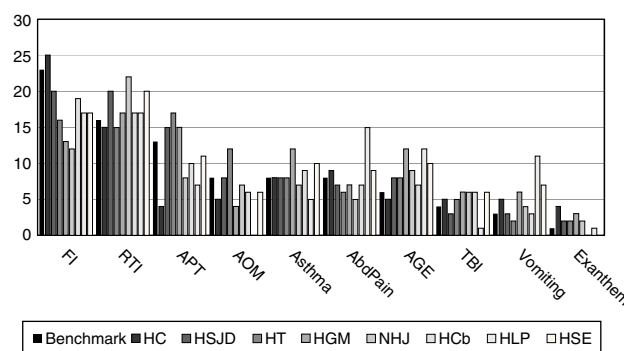
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## Introduction and objectives

It has already been 14 years since the Quality Working Group (WG) of the Spanish Society of Pediatric Emergencies (SEUP) published a list of diagnostic codes based on the International Classification of Diseases ICD-9-CM and adapted to the idiosyncrasies of Paediatric Emergency Departments (PEDs).<sup>1,2</sup> The list included 182 codes that were selected according to the following criteria: frequently used diagnosis, non-specific enough to require a definition, and characteristic of emergency care. This coding system has been incorporated into most Spanish PEDs, providing us with a common language and a better knowledge of the overall epidemiology in our departments. Furthermore, its implantation has helped improve multicentre research and assess epidemiological differences in PED visits across autonomous communities. On the other hand, the SEUP diagnostic coding is part of the quality standards of Spanish PEDs.<sup>3</sup>

The increase in the competencies and specialties of PEDs in recent years has been reflected in their approach to patient management and clinical practice, which has become more child- and family-centred. As a consequence, management tools for ongoing quality improvement have been introduced, including the unification of diagnostic criteria and diagnostic coding. In this regard, in 2009 the WG asked 8 hospitals that had implemented the new coding system to provide a list of the 20 most frequent diagnoses of the first trimester of the year (Fig. 1), which revealed inconsistencies in the coding of certain diagnoses, especially those involving upper respiratory tract pathology. In light of this and a few other problems detected in the application of some of the diagnostic codes of the original list, the Quality WG of the SEUP decided, two years ago, to undertake a revision of this with three key objectives in mind:

- Addition of codes, which were not included in the 2000 listing, due to their frequent or emerging use in PEDs.
- Revision of the codes included in the original list to assess the exclusion of any potentially outdated codes.



**Figure 1** Most frequent diagnoses in several Spanish PEDs in 2009. AbdPain, abdominal pain; AGE, acute gastroenteritis; AOM, acute otitis media; APT, acute pharyngotonsillitis; FI, febrile illness; HC, Hospital Universitario Cruces; HCb, Hospital Cabueñes; HGM, Hospital Universitario Gregorio Marañón; HLP, Hospital Universitario La Paz; HSD, Hospital Universitario Son Espases; HT, Consorci Sanitari de Terrassa; NHJ, Hospital Universitario Niño Jesús; RTI, respiratory tract infection; SJD, Hospital Sant Joan de Déu; TBI, traumatic brain injury.

- Update of the codes of the original list to match the most recent version of the ICD-9-CM.

## Method

Our working process was the following.

We evaluated the current uniformity in diagnostic practice in Spanish PEDs, asking the hospitals of the WG members for a list of the 20 most frequent diagnoses in one trimester of the year (January 1 to March 31, 2014). In order to build a picture of the variability in coding, we developed a benchmark using the coding averages of the participating hospitals.

We asked the hospitals of the WG members to propose diagnoses to be added or removed from the general list. Proposing a diagnosis required providing an ICD-9 code

**Table 1** Added diagnoses.

959.9 (E819.9)	Motor vehicle accident: patient with any type of injury from a motor vehicle accident, involved as either a pedestrian or a passenger
994.1 (E928.9)	Drowning: patient with respiratory, cardiovascular or neurologic manifestations associated with submersion and asphyxia in a liquid medium, usually water
282.60	Sickle cell disease: patient in whom the full blood exam reveals morphological abnormalities of red blood cells, which adopt a sickle-like shape
995.0 (E928.9)	Anaphylaxis: 2 or more of the following symptoms occurring soon after exposure of the patient to a suspected allergen: skin and/or mucosal involvement; respiratory compromise; cardiovascular compromise; persistent gastrointestinal symptoms: recurrent vomiting, stomach cramps
786.09	Apnoea/apparent life-threatening event (ALTE): sudden episode that is frightening to the observer and is characterised by some combination of apnoea (central, occasionally obstructive), colour change (cyanotic or pallid, occasionally erythematous); marked change in muscle tone (usually diminished); choking or gagging
574.90	Cholelithiasis: patient with ultrasound diagnosis of gallbladder and/or bile duct lithiasis
977.9 (E947.9)	Exposure to nontoxic substance: accidental or intentional exposure to potentially nontoxic substance
446.1	Kawasaki disease: fever and presence of at least 4 of the following: (1) bilateral conjunctival injection without exudate; (2) changes in oropharyngeal mucosa, including oropharyngeal hyperaemia, dry, bright red cracked lips, and/or strawberry tongue; (3) changes in extremities, such as oedema and/or red-purple erythema of hands and feet, desquamation usually beginning in the periungual region; ((4) polymorphous exanthem beginning in trunk, without vesicles, blisters or crust; (5) cervical lymphadenopathy, usually affecting the anterior cervical chain
783.41	Failure to thrive: child with weight below the 3rd percentile, with a drop in growth crossing 2 growth percentiles, or decrease in growth velocity based on the child's growth curve (in a growth chart standardised for sex, age and ethnicity)
034.0	Streptococcal pharyngitis: inflammation of the pharynx and/or tonsils (swelling and hyperaemia with or without exudate) with rapid test or throat swab culture positive to group A beta-haemolytic streptococcus
288.00	Fever and neutropaenia (oncology patient): grade IV neutropaenia (total neutrophil count $<500 \text{ mm}^3$ ) and axillary temperature $>38.5^\circ\text{C}$ or $>38^\circ\text{C}$ in 2 separate measurements
829.0 (E887)	Fracture: radiological or sonographic evidence of fracture in any bone
008.61	Enteritis due to rotavirus: increase in the daily volume of stools, with increased frequency of bowel movements and more watery stools, with or without vomiting and/or fever, and rapid test or culture positive for rotavirus
487.1	Influenza: compatible clinical presentation with microbiological confirmation by rapid testing, immunofluorescence, PCR or culture
074.0	Herpangina: pharyngotonsillar infection by Coxsackie virus, characterised by high fever and vesicles/ulcerations in the soft palate and tonsils
799.02	Hypoxaemia: patient presenting with an oxygen saturation $<95\%$ measured by pulse oximetry and symptoms requiring supplemental oxygen
518.81	Acute respiratory failure: failure of respiratory system function manifested as abnormalities in gas exchange ( $\text{PaO}_2 < 60$ and $\text{PCO}_2 > 45$ or $\text{SatO} < 90\%$ measured by pulse oximetry, and $\text{CO}_2 > 45$ measured by capnography)
239.9	Neoplasm of unspecified nature: unspecified mass or tumour in any body site
771.4	Omphalitis/umbilical granuloma: inflammation of the umbilicus and periumbilical region, usually due to infection. Nodule of friable tissue that usually appears in the surface of the navel
V64.2	Patient leaves emergency department by own decision: patient that voluntarily leaves the emergency department before the care process is complete

**Table 1** (Continued)

577.0	Pancreatitis: patient with compatible symptoms and elevated amylase/lipase levels with no other identified cause
379.90	Disorder of eye, unspecified: signs and symptoms of an eye disorder without a specific diagnosis. Includes red eyes, eye swelling, nonspecific complaints, etc.
919.8 (E920.5)	Needlestick injury (hypodermic needle injury): accidental puncture in any site of the body by a discarded needle that was probably used by injection drug users
132.0	Pediculus capitis/infestation of scalp by lice: infestation by head lice
511.9	Pleural effusion: buildup of pleural fluid associated to lung infection
055.9	Measles: patient with compatible symptoms, Koplik spots and/or history of measles in close relatives
785.52	Septic shock: sepsis and cardiovascular. Cardiovascular dysfunction: Hypotension (SBP < 5th percentile for age or 2 SDs below normal for age not improving with infusion of >40 mL/kg of isotonic crystalloid in 1 hour); or need of vasoactive drugs to maintain normal BP; or 2 or more of the following: unexplained metabolic acidosis (BE < 5 mEq/L); lactate above twice the upper limit of normal; oliguria (diuresis <0.5 mL/kg/h); capillary refill >5 s; core to peripheral temperature gap >3 °C
995.50 (E967.9)	Suspected child abuse: suspicion of any interaction or lack thereof between a child and his or her caregivers resulting in non-accidental damage to the physical state and development of the child
036.2	Suspected meningococcaemia: presence of fever and macular or purpuric exanthem of acute onset, with laboratory, white blood cell count, CRP or procalcitonin values suggestive of bacterial infection
493.01	Status asthmaticus: persistence of the signs and symptoms of moderate to severe respiratory distress and/or need for supplemental oxygen after initial rescue treatment, 3 doses of salbutamol + ipratropium and systemic corticosteroids
345.3	Status epilepticus: epileptic activity with onset in a prehospital setting that persists on arrival to the emergency department, or for seizures that start in the emergency department, epileptic activity or recurrence of seizures without return to baseline lasting more than 5 min
427.0	Paroxysmal supraventricular tachycardia: rapid heart rate, usually above 150 bpm and often above 200 bpm, of supraventricular, atrial, atrioventricular, or junction/nodal origin. Sinus tachycardia is ruled out
277.9	Unspecified disorder of metabolism: nonspecific metabolic disorder in the absence of a specific diagnosis
873.63 (E928.9)	Tooth injury: any traumatic injury of a tooth
370.00	Corneal ulcer: defect in the corneal epithelium, usually caused by trauma, foreign body removal or infection

accompanied by descriptor and a definition, following the same procedure used in the elaboration of the 2000 list.

The codes proposed for addition to the list were analysed by experts in medical documentation, who also updated the codes of the original list to match the 2014 version of the ICD-9-CM (9th edition).<sup>4</sup>

## Results

Fig. 2 shows a graph with the most frequent diagnoses in the WG participating hospitals for 2014. It is apparent that while there are still some coding inconsistencies, uniformity seems to have increased after the introduction of the SEUP coding system in the participating PEDs.

The decision was made to keep all the codes included in the original list. Table 1 lists the 35 codes newly added, and Table 2 the updates to 15 codes that were already in the list. We have also included a list of traumatology codes that may be helpful to PEDs that have incorporated this specialty into their competencies (Table 3).

## Closing comments

The updated SEUP diagnostic list is partly a reflection of the changes that our PEDs have been experiencing in recent years. This endeavour is not finished, as the key to the usefulness of the SEUP coding system is its continuous updating through the feedback and contribution of all its users.

**Table 2** Updated codes.

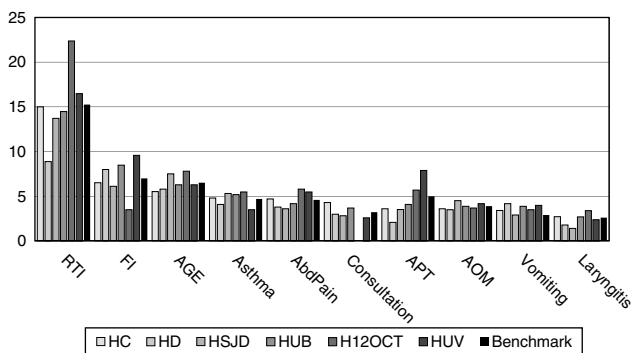
930.9 (E914)	Foreign body on eye
933.0 (E912)	Foreign body in pharynx
276.51	Dehydration
995.20 (E947.9)	Adverse effect of pharmacological substance
528.00	Stomatitis/mucositis
564.00	Constipation
599.70	Haematuria
786.30	Haemoptisis
789.30	Abdominal or pelvic mass
383.00	Mastoiditis
287.31	Idiopathic thrombocytopaenic purpura
999.52 (E949.9)	Serum reaction to vaccination
780.60	Febrile illness
608.20	Torsion of testis/hydatid of Morgagni
959.09 (E928.9)	Trauma/injury to head and neck

**Table 3** Supporting traumatology codes (optional). When used, these codes need to be preceded by the letter ‘E’. The general code E928.9 can also be used.

887.4	Amputation of arm
886.0	Amputation of finger(s) (excluding the thumb)
895.0	Amputation of toe(s)
887.0	Amputation of hand
896.0	Amputation of foot
897.0	Amputation of leg below knee
885.0	Amputation of thumb
840.0	Acromioclavicular sprain
847.0	Neck sprain
841.9	Elbow/forearm sprain
842.00	Wrist sprain
845.10	Foot sprain
844.0	Sprain of lateral collateral ligament of knee
844.1	Sprain of medial collateral ligament of knee
845.00	Ankle sprain
845.01	Deltoid ligament ankle sprain
845.02	Calcaneofibular ligament ankle sprain
808.1	Open fracture of acetabulum
808.0	Closed fracture of acetabulum
825.1	Open fracture of calcaneus
825.0	Closed fracture of calcaneus
810.10	Open fracture of clavicle
810.00	Closed fracture of clavicle
807.1	Open fracture of rib(s)
807.0	Closed fracture of rib(s)
813.32	Open fracture of shaft of ulna
813.22	Closed fracture of shaft of ulna
813.53	Open fracture of distal end of ulna
813.43	Closed fracture of distal end of ulna
814.11	Open fracture of scaphoid bone of wrist
814.01	Closed fracture of scaphoid bone of wrist
811.10	Open fracture of scapula
811.00	Closed fracture of scapula
807.3	Open fracture of sternum
807.2	Closed fracture of sternum
816.10	Open fracture of phalanx or phalanxes of hand
816.00	Closed fracture of phalanx or phalanxes of hand
826.1	Open fracture of one or more phalanxes of foot
826.0	Closed fracture of one or more phalanxes of foot
820.9	Open fracture of neck of femur
820.8	Closed fracture of neck of femur
821.11	Open fracture of shaft of femur
821.01	Closed fracture of shaft of femur
821.30	Open fracture of lower end of femur
821.20	Closed fracture of lower end of femur
814.10	Open fracture of carpal bone
814.00	Closed fracture of carpal bone
802.1	Open fracture of nasal bones
802.0	Closed fracture of nasal bones
812.10	Open fracture of upper 1/3 of humerus
812.00	Closed fracture of upper 1/3 of humerus
812.52	Open fracture of lateral condyle of humerus
812.42	Closed fracture of lateral condyle of humerus
812.53	Open fracture of medial condyle of humerus
812.43	Closed fracture of medial condyle of humerus
812.31	Open fracture of shaft of humerus
812.21	Closed fracture of shaft of humerus

A study has recently validated the application of the ICD-10 coding system to diagnostic coding in PEDs.<sup>5</sup> This evolution in the coding system will be implemented in Spain in upcoming years, and adjusting to this new standard will require a new revision of our coding system.

We hope that the work we have done will contribute to the spread of this common language, which has been key in the management of PEDs and contributed to quality improvement and subspecialty development in this setting.



**Figure 2** Most different diagnoses in several Spanish PEDs in 2014. AbdPain, abdominal pain; AGE, acute gastroenteritis; AOM, acute otitis media; APT, acute pharyngotonsillitis; FI, febrile illness; H12OCT, Hospital Universitario 12 Octubre; HB, Hospital de Basurto; HC, Hospital de Cruces; HD, Hospital Universitario Donostia; HSJD, Hospital Sant Joan de Déu; HUV, Hospital Universitario Río Hortega; RTI, respiratory tract infection.

**Table 3** (Continued)

812.51	Open supracondylar fracture of humerus
812.41	Closed supracondylar fracture of humerus
815.10	Open fracture of metacarpal bone
815.00	Closed fracture of metacarpal bone
815.14	Open fracture of neck of metacarpal bone
815.04	Closed fracture of neck of metacarpal bone
813.13	Open Monteggia's fracture
813.04	Closed Monteggia's fracture
823.11	Open fracture of upper 1/3 of fibula
823.01	Closed fracture of upper 1/3 fibula
823.31	Open fracture of shaft of fibula
823.21	Closed fracture of shaft of fibula
808.3	Open fracture of pubis
808.2	Closed fracture of pubis
813.15	Open fracture of head of radius
813.05	Closed fracture of head of radius
813.16	Open fracture of neck of radius
813.06	Closed fracture of neck of radius
813.31	Open fracture of shaft of radius
813.21	Closed fracture of shaft of radius
813.52	Open fracture of distal end of radius
813.42	Closed fracture of distal end of radius
813.33	Open fracture of shaft of radius with ulna
813.23	Closed fracture of shaft of radius with ulna
813.54	Open fracture of lower end of radius with ulna
813.44	Closed fracture of lower end of radius with ulna
822.1	Open fracture of patella
822.0	Closed fracture of patella
805.7	Open fracture of sacrum and coccyx
805.6	Closed fracture of sacrum and coccyx
825.30	Open fracture of tarsal/metatarsal bone
825.20	Closed fracture of tarsal/metatarsal bone
823.12	Open fracture of upper 1/3 of fibula with tibia
823.02	Closed fracture of upper 1/3 of fibula with tibia
823.22	Open fracture of shaft of fibula with tibia
823.2	Closed fracture of shaft of tibia and fibula
823.10	Open fracture of upper 1/3 of tibia
823.00	Closed fracture of upper 1/3 of tibia
823.30	Open fracture of shaft of tibia
823.20	Closed fracture of shaft of tibia
824.5	Open bimalleolar fracture
824.4	Closed bimalleolar fracture
824.3	Open fracture of lateral malleolus
824.2	Closed fracture of lateral malleolus
824.1	Open fracture of medial malleolus
824.0	Closed fracture of medial malleolus
824.7	Open trimalleolar fracture
824.6	Closed trimalleolar fracture
805.10	Open fracture of cervical vertebra
805.00	Closed fracture of cervical vertebra
805.3	Open fracture of thoracic vertebra
805.2	Closed fracture of thoracic vertebra
805.5	Open fracture of lumbar vertebra
805.4	Closed fracture of lumbar vertebra
927.10	Crushing injury of forearm
927.03	Crushing injury of arm
928.01	Crushing injury of hip
927.11	Crushing injury of elbow
927.3	Crushing injury of fingers

**Table 3** (Continued)

928.3	Crushing injury of toes
927.00	Crushing injury of shoulder
927.20	Crushing injury of hand
927.21	Crushing injury of wrist
928.00	Crushing injury of thigh
928.20	Crushing injury of foot
928.10	Crushing injury of lower leg
928.11	Crushing injury of knee
928.21	Crushing injury of ankle
835.10	Open dislocation of hip
835.00	Close dislocation of hip
832.10	Open dislocation of elbow
834.10	Open dislocation of finger
834.00	Closed dislocation of finger
831.10	Open dislocation of shoulder
831.00	Closed dislocation of shoulder
838.10	Open dislocation of foot
838.00	Closed dislocation of foot
836.60	Open dislocation of knee
836.50	Closed dislocation of knee
836.4	Open dislocation of patella
836.3	Closed dislocation of patella
837.1	Open dislocation of ankle
837.0	Closed dislocation of ankle
839.10	Open dislocation of cervical vertebra
839.00	Closed dislocation of cervical vertebra
839.31	Open dislocation of thoracic vertebra
839.21	Closed dislocation of thoracic vertebra
839.30	Open dislocation of lumbar vertebra
839.20	Closed dislocation of lumbar vertebra

## Conflicts of interest

The authors have no conflicts of interest to declare.

## Appendix A. Quality Working Group of the SEUP:

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