Medicines & Healthcare products Regulatory Agency

MHRA
Regulating Medicines and Medical Devices

DCB1582 Amd 16/2017 Electronic Yellow Card Reporting Specification

Amendment History:

Version	Date	Amendment History
0.1	22/08/11	First draft
0.2	18/10/11	Second draft
0.3	28/11/11	Updated in response to feedback from appraisers and system providers
0.4	12/12/11	Updated in response to feedback from a system providers
1.0	16/12/11	Final version
1.1	16/01/2012	Final version following ISMS QA
2.0	06/08/2012	Update to xml message and field validations, and urls for webservice
3.0	31/05/2017	Update to requirements, conformance criteria and xml message and field evaluation.
3.1	01/08/2017	Update in response to SME feedback
3.2	11/09/2017	Update in response to further SME feedback

Approvals:

Name	Organisation	Version	Date
Paul Barrow	MHRA	1.0	16/12/2011
Paul Barrow	MHRA	2.0	10/08/2012
Becky Owen	MHRA	3.2	13/09/2017

Any queries on the content on this document should be directed to the standard developer or the pharmacovigilance team at the MHRA, pharmacovigilance@mhra.gov.uk in the first instance.

Data Coordination Board

This information standard (DCB1582) has been approved for publication by the Department of Health under section 250 of the Health and Social Care Act 2012.

Assurance that this information standard meets the requirements of the Act and is appropriate for the use specified in the specification document has been provided by the Data Coordination Board (DCB), a sub-group of the Digital Delivery Board.

This information standard comprises the following documents:

- Requirements Specification
- Implementation Guidance
- Change Specification.

An Information Standards Notice (DCB1582 Amd 16/2017) has been issued as a notification of use and implementation timescales. Please read this alongside the documents for the standard.

The controlled versions of these documents can be found on the NHS Digital website. Any copies held outside of that area, in whatever format (e.g. paper, email attachment), are considered to have passed out of control and should be checked for currency and validity.

Date of publication: 26 October 2017.

Glossary of Terms

Term	Definition
ADR	Adverse Drug Reaction
AMP	Actual Medicinal Product
CHM	Commission on Human Medicines
CQC	Care Quality Commission
dm+d	Dictionary of Medicines and Devices
DTD	Document Type Definition
E2B(R2)	(Not an acronym) International messaging standard for adverse drug reactions
EC	European Commission
EMA	European Medicines Agency
FOIA	Freedom of Information Act
GP	General Practitioner
ICH	International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use
ICSR	Individual Case Safety Report
LLT	Lower Level Term
MedDRA	Medical Dictionary for Regulatory Activities
MHRA	Medicines and Healthcare products Regulatory Agency
MSSO	Maintenance and Support Services Organisation
NPFIT	National Program for Information Technology
NHS	National Health Service
NPSA	National Patient Safety Agency
Read	Read Clinical Codes or National Health Service (NHS) Clinical Terms
SPF	Security Policy Framework
SOAP	Simple Object Access Protocol
SNOMED CT	Systematized Nomenclature of Medicine Clinical Terms
UML	Unified Modelling Language
URL	Uniform Resource Locator
XML	eXtensible Mark-up Language

Contents

1 Overview

1.1 Summary

Standard	
Standard Number	DCB1582
Title	Electronic Yellow Card Reporting
Description	The Medicines and Healthcare products Regulatory Agency (MHRA) collects reports of suspected adverse drug reactions (ADRs) via the Yellow Card Scheme. These provide a source of information on potential drug safety issues allowing the agency to take regulatory action to protect public health. Healthcare professionals report ADRs either by completing a paper form or a form on an external website/App. This standard defines a method for submitting the information electronically; this allows IT systems to reduce the burden on the clinician by populating the majority of the Yellow Card submission from the patient's electronic record. The information standard incorporates the ICH E2B(R2) international standard format for reporting adverse drug reactions.
Applies to	NHS organisations including any healthcare professional which contribute to the MHRA Yellow Card Scheme. GP Practices MUST follow this standard. Other health organisations MAY follow this standard. The standard excludes medical device incident reporting, reporting of adverse events or reactions to blood or blood components, defective medicine reporting, and reporting of medication errors where no harm occurs. In Scope The standard is for providers of NHS care or treatment, medical/clinical teams in other health organisations. It is intended to be used in, but is not limited to: • GP Surgeries / Primary care. • Pharmacies. • Acute hospitals. • Community, day hospitals, day services, outpatient clinics. • The patient's home or any other remote setting (depending on the specific NHS organisation's infrastructure and technological capability). Exclusions The Standard is currently out of scope and not intended for use for the following groups: • Patient • Parent/Carers The overall scope of the standard is NHS in England. However, the remit of the MHRA and Yellow Card Scheme is UK wide therefore Scotland, Wales and Northern Ireland will be asked to adopt this standard.
Impacts on	IT system suppliers of GP Practices and other health organisations whose clients MUST/MAY contain electronic Yellow Card functionality within their clinical system.

Release	
Release Number	Amd 16/2017
Title	Electronic Yellow Card Reporting Specification v3.2
Description	Standard amended to update requirements, conformance criteria and XML Message and Field Validations
Implementation Completion Date	01/12/2018

1.2 Controlled Documents

Document Reference	Name
DCB1582 electronic Yellow Card message fields and validations v3.0	Electronic Yellow Card message field list, validations and lists of values.
E2BX_ICSR.DTD	Electronic Yellow Card message document type definition
ExampleICSR v3 0.xml	Example of an electronic Yellow Card message which meets validation requirements
ExampleICSRfail v3 0.xml	Example of an electronic Yellow Card message which fails validation requirements

1.3 Guidance

Document Reference	Name
E2B_R2_Guideline	Maintenance of the ICH guideline on clinical safety data management : Data elements for transmission of individual case safety reports E2B(R2)
NPFIT-EP-DB-0007.04	Representation in Electronic Patient Records of Allergic Reactions, Adverse Reactions, and Intolerance of Pharmaceutical Products
Principles	Editorial Principles for Clinical Classification Cross-mapping in UK Edition of SNOMED CT

1.4 Related Standards

Reference	Title
ICH E2B(R2)	Electronic Transmission of Individual Case Safety Reports Message Specification (ICH ICSR DTD Version 2.33)
SCCI0052	Dictionary of medicines and devices (dm+d)
SCCI0034	SNOMED CT

2 Purpose

The core purpose of this Operational Standard is to improve patient safety by improving reporting of suspected adverse drug reactions to the MHRA. This enables the agency to take prompt regulatory action to help protect public health. Surveys of health professionals carried out for the MHRA have highlighted a number of barriers to reporting, and this standard addresses these by:

- Making Yellow Card reporting easier by simplifying completion of the form
- Removing the administrative burden from gathering together relevant information
- Removing the need for completing and posting paper forms

Implementation of such a feature for users in SystmOne has demonstrated the impact this can have on Yellow Card reporting rates. An analysis of numbers of Yellow Cards from GP in 2011 showed an increase of around 50% compared to 2010 by introducing electronic Yellow Card reporting into those practices using SystmOne (understood to be around ~15-20%). In 2016, over 20% of directly reported Yellow Cards were received via SystmOne.

3 Background

The Medicines and Healthcare products Regulatory Agency (MHRA) – https://www.gov.uk/government/organisations/medicines-and-healthcare-products-regulatory-agency – is an executive agency of the Department of Health. Its role is to 'enhance and safeguard the health of the public by ensuring that medicines and medical devices work and are acceptably safe'.

The MHRA has the following aims:

- Protecting public health through regulation, with acceptable benefit-risk profiles for medicines and devices.
- Promoting public health by helping people who use these products to understand their risks and benefits.
- Improving public health by encouraging and facilitating developments in products that will benefit people.

The agency therefore has a regulatory and licensing role for both medicines and medical devices; it issues advice and guidance and monitors suspected adverse drug reactions and adverse incidents involving medical devices.

Before a medicine is granted a licence so that it can be made available in the United Kingdom, it must pass strict tests and checks to ensure that it is acceptably safe and effective. All effective medicines, however, can cause side effects (also known as adverse drug reactions), which can range from being minor to being very serious. For a medicine to be granted a licence, the expected benefits of the medicine must outweigh the possible risks of the medicine causing adverse effects in patients. Sometimes it is difficult to tell whether a suspected adverse drug reaction is due to a medicine or another underlying reason.

An adverse drug reaction is defined by the World Health Organisation as a response to a drug which is noxious and unintended, and which occurs at doses normally used in man for the prophylaxis, diagnosis, or therapy of disease, or for the modification of physiological function[1]. The MHRA asks patients and health professionals to report this on a Yellow Card even if it is only a suspicion that a medicine or combination of medicines has caused a side effect – the reporter does not need to be sure a medicine has caused a reaction to report it.

Yellow Card reports from both health professionals and members of the public are collected on reactions to:

- All licensed medicines and vaccines (i.e. including those classified as prescription (POM), pharmacy (P), Over-the-counter (OTC) or general retail sale (GSL)).
- Herbal and complementary remedies.
- Unlicensed medicines.

[1] The importance of pharmacovigilance - Safety monitoring of medicinal products. WHO 2002

- Medicines used 'off-label' (where a licensed medicine is used outside the recommended guidelines, i.e. for an unapproved indication or patient population)

The MHRA (and its predecessor organisations) have collected reports of suspected adverse drug reactions through the Yellow Card scheme for over 50 years. Since the establishment of the Yellow Card scheme over 800,000 UK reports have been collected. Currently approximately 40,000 Yellow Card reports are received each year, with about half of these being from the pharmaceutical industry, and the remainder from health professionals and patients.

3.1 ADR Reporting as a Professional Responsibility

Yellow Cards are submitted by health professionals on a voluntary basis. Professional bodies regulating health professionals recognise the importance of contributing to patient safety with some specifically stating Yellow Card reporting as a professional responsibility.

The following table provides relevant statements from guidance documents of professional bodies:

Professional body	Relevant guidance
General Medical Council	**Good Medical Practice: Maintaining & improving your performance** 23. To help keep patients safe you must: d. report suspected adverse drug reactions e. respond to requests from organisations monitoring public health. When providing information for these purposes you should still respect patients' confidentiality.[14]
Nursing and Midwifery Council	**Standards of proficiency for nurse and midwife prescribers** "3.7 Reporting adverse reactions If a patient/client experiences an adverse reaction to a medication they have been prescribed, you should record this in the patient/client's notes, notify the prescriber (if you did not prescribe the drug) and notify via the Yellow Card Scheme immediately. Yellow cards are found in the back of the British National Formulary and also online at https://yellowcard.mhra.gov.uk/ . In addition you have a duty to inform the patient/client that they may also report adverse reactions independently to the Yellow Card Scheme. You can also report adverse reactions via the Medicines and Healthcare Products Regulatory Agency (MHRA) website at https://www.gov.uk/government/organisations/medicines-and-healthcare-products-regulatory-agency and any untoward incidents should be reported to the National Patient Safety Agency (NPSA)."

Professional body	Relevant guidance
General Pharmaceutical Council	Standards of conduct, ethics and performance for pharmacy professionals The General Pharmaceutical Council have a less clearly supportive statement. "All pharmacy professionals contribute to delivering and improving the health, safety and wellbeing of patients and the public. Professionalism and safe and effective practice are central to that role." "Applying the standards…. People receive safe and effective care when pharmacy professionals: Assess the risks in the care they provide and do everything they can to keep these risks as low as possible"

3.2 Using Yellow Card Data to Help Protect Public Health

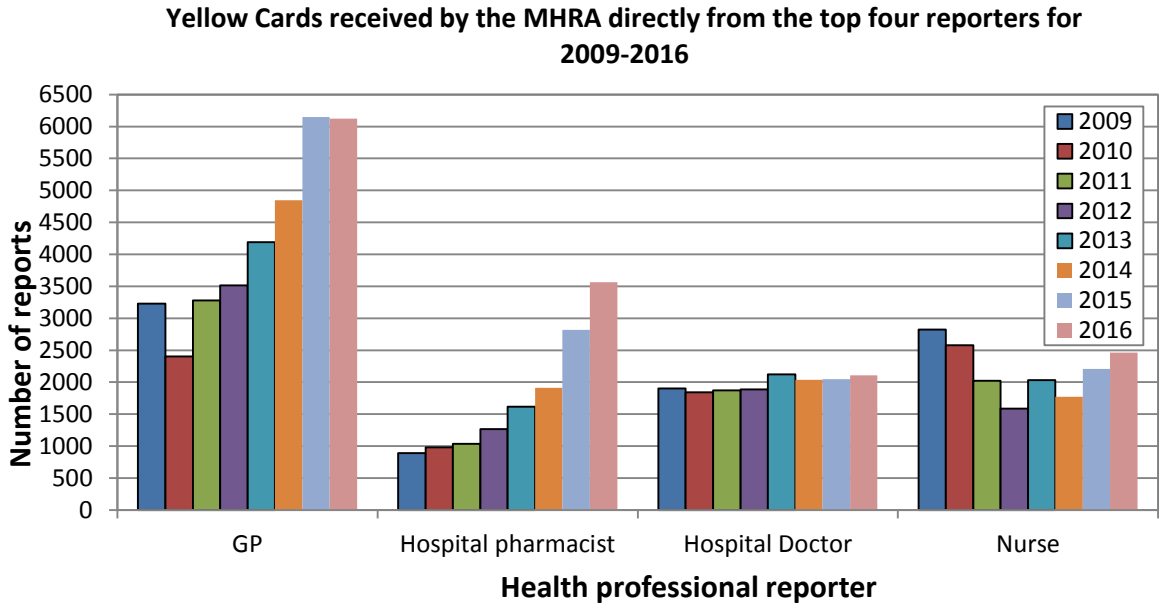
Information gathered from Yellow Card reports made by patients and health professionals is assessed at the MHRA by a team of experts made up of doctors, pharmacists and scientists who study the benefits and risks of medicines. Yellow Card reports on suspected side effects received by MHRA are evaluated, together with additional sources of information to identify previously unidentified safety issues or side effects.

Where an issue is identified the agency can take a range of regulatory actions to protect public health. This most commonly involves changes to the product information (the patient information leaflet, or summary of product characteristics); although in extreme cases a medicine can be withdrawn where risks are considered to outweigh the benefits. Some examples of safety issues where Yellow Card data has contributed can be seen in section 13.

Spontaneous adverse reaction reporting schemes such as the Yellow Card Scheme are common sources for identification of drug safety signals. The value of the scheme has been demonstrated many times and it has helped to identify numerous important safety issues. For example, warnings were added to the product information for the smoking-cessation drug varenicline after the MHRA received Yellow Cards reporting patients experiencing suicidal thoughts. Advice was issued that patients taking varenicline who develop suicidal thoughts or who develop agitation, depressed mood, or changes in behaviour that are of concern for the doctor, patient, family, or caregiver should stop their treatment and contact their doctor immediately.

3.3 Improving Reporting of Adverse Drug Reactions

The scheme does not provide comprehensive coverage of adverse drug reactions – many studies have investigated this and it is estimated that less than 10% of adverse drug events are reported. Additionally, there was evidence that the number of reports from general practice was falling, perhaps because of GP workload issues. In 2010 an analysis of Yellow Card data showed that for the first time since the establishment of the Yellow Card Scheme in 2010 GPs were no longer the largest reporter group.



Increased numbers of promptly received and well-completed Yellow Cards ultimately makes more data available to the MHRA for the identification of possible drug safety issues, and so help protect public health. One of the most significant developments to strengthen the scheme is in the availability of methods for health professionals to report ADRs electronically through clinical systems. Much of the information required for a Yellow Card is held within a clinical system such as patient information, medical history and drugs. This data could therefore quickly be populated onto an electronic Yellow Card at the touch of a button reducing effort for the reporter.

By the end of 2016, 40% of GP practices had electronic Yellow Card functionality implemented and it is making reporting quicker and simpler. This has increased the number of Yellow Card reports received by the MHRA from practices. GPs have once again become the cornerstone of the Yellow Card Scheme accounting for 30% of all direct healthcare professional reports (data shown above). It is estimated that implementation in all of GP practices will result in further 5,000 reports each year.

4 Definitions

Where used in this document set, the keywords **must**, **should**, **may**, **must not** and **should not** are to be interpreted as described in RFC 2119[2].

- **Must**: This word, or the terms "**required**" or "**shall**", means that the definition is an absolute requirement of the specification
- **Should**: This word, or the adjective "**recommended**", means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications **must** be understood and carefully weighed before choosing a different course.
- **May**: This word, or the adjective "**optional**", means that an item is truly optional. One implementer may choose to include the item because a particular implementation requires it, or because the implementer feels that it enhances the implementation while another implementer may omit the same item. An implementation which does not include a particular option **must** be prepared to interoperate with another implementation which does include the option, perhaps with reduced functionality. In the same vein, an implementation which does include a particular option **must** be prepared to interoperate with another implementation which does not include the option (except of course, for the feature the option provides).
- **Must not**: This phrase, or the phrase "**shall not**" mean that the definition is an absolute prohibition of the specification.
- **Should not**: This phrase, or the phrase "**not recommended**" mean that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications **should** be understood and the case carefully weighed before implementing any behaviour described with this label.

4.1 Adverse Drug Reaction Definition

A range of definitions for medication-related events is available in published literature. For the purposes of this document the following definitions have been adopted from *NPFIT-EP-DB-0007.04 Representation in Electronic Patient Records of Allergic Reactions, Adverse Reactions, and Intolerance of Pharmaceutical Products.*

4.1.1 Allergic Drug Reaction (Allergic Response)

A response to a pharmaceutical product to which an individual has become sensitised, in which histamine, serotonin and other vasoactive substances are released, in response to an immune system-mediated reaction.

This causes systemic symptoms which can include pruritus, erythema, flushing, urticaria, angio-oedema, nausea, diarrhoea, vomiting, laryngeal oedema, bronchospasm, hypotension, cardiovascular collapse and death.

[2] http://www.faqs.org/rfcs/rfc2119.html

4.1.1.1 Sensitivity/ Hypersensitivity

Although it is recognised that the terms 'Sensitivity' and 'Hypersensitivity' are used by clinicians to describe allergic phenomena, it is felt that this terminology is used inconsistently and is therefore, to be deprecated.

4.1.2 Adverse Drug Reaction

A response to a pharmaceutical product which is noxious and unintended and which occurs at doses normally used in man for prophylaxis, diagnosis, or therapy of disease or for modification of physiological function.[3]

4.1.3 Drug Intolerance

An undesirable effect produced by the pharmacological actions of a pharmaceutical product at therapeutic or subtherapeutic dosages and which prevents the patient from tolerating treatment with that product.[4]

It is evident from the above definitions that there is considerable overlap between these concepts. The MHRA consider that the concept of adverse drug reaction encompasses all of these definitions, and therefore that all of these are reportable using the Yellow Card Scheme.

[3] World Health Organisation definition: *Guidelines for good clinical practice (GCP) for trials on pharmaceutical products*: WHO Technical Report Series, No. 850, 1995 http://apps.who.int/medicinedocs/en/d/Jwhozip13e/

[4] Gruchalla RS. (2000) Clinical assessment of drug-induced disease. *Lancet*, 356, 1505 http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(00)02885-3/ppt

5 Concept of Operation

Health professionals currently submit Yellow Cards reporting adverse drug reactions occurring in patients on a voluntary basis. Sending an electronic Yellow Card directly from a clinical system reduces the effort required to complete it as a significant quantity of the information required can be populated automatically. Other existing reporting routes require manual completion of a form for either posting or electronic transmission.

5.1 Confidentiality

Yellow Cards do not include identifiable patient information and health professionals do not need to seek the permission of a patient in order to send a Yellow Card.

The MHRA meets current Government requirements and standards for management of security risk across its network to ensure sensitive data is protected adequately. It is externally audited and approved for connection to the Public Services Network.

Under the agreement of its directors and DH the MHRA applies the Cabinet Office Security Policy Framework (SPF) to its security controls and policies, which are also aligned to ISO270001[5]. Its security policy has been agreed and approved by the MHRA Directors. The MHRA complete a security return each year which is reviewed by the security team at the DH and accepted by the Cabinet Office. Under the SPF the MHRA operates a system of Information Asset Ownership and governance to manage information risk. The CEO, Dr Ian Hudson, is the Caldicott Guardian for the MHRA; the senior person responsible for protecting the confidentiality of patient and service-user information and enabling appropriate information-sharing. The Guardian plays a key role in ensuring that the organisation satisfies the highest practicable standards for handling patient identifiable information.

5.2 Yellow Card Message

Yellow Card messages are based on the ICH E2B(R2) Individual Case Safety Report international standard[6]. Please see ExampleICSR v3 0.xml for example content.

Field definitions for the ICSR xml can be found in the spreadsheet DCB1582 electronic Yellow Card message fields and validations v3.0 and E2BX_ICSR.DTD provides the document type definition (DTD).

The message must be encoded using either the ISO-8859-1, UTF-8 or UTF16 character-sets.

Yellow Card messages are transmitted only in one direction - from the clinical system directly to the MHRA. There is no automatic process for nullification of Yellow Card reports. If necessary, any such action would be handled manually through contacting the MHRA.

[5] http://www.27000.org/iso-27001.htm
[6] http://www.ich.org/products/electronic-standards.html

5.3 Terminologies

Drugs/medicines are populated in the Yellow Card XML message using dm+d term name values.

Clinical terminology must be populated using SNOMED CT concept IDs. Systems using Read V2, Read V3 or CTV3 should map each term to SNOMED CT using the mappings distributed by NHS Digital Technology Reference data Update Distribution[7] before being populated in the Yellow Card message. SNOMED CT terms do not need to be stored against the patient record.

5.4 Yellow Card Triggers

On a number of specific triggers, it must be possible for a user to decide whether to create and populate a Yellow Card before it is transmitted to the MHRA electronically through the MHRA webservice. These triggers **must** include:

- Manual request by user to create Yellow Card
- On stopping of a repeat prescription medicine, a user confirming the reason being due to a patient having experienced an adverse drug reaction/drug intolerance/allergic drug reaction

Additional triggers which **should** also be included are:

- Recording of an ADR/drug intolerance/allergic drug reaction which has occurred since the last consultation in the patient record. (i.e. a historical episode already recorded in the patient record should not trigger a Yellow Card, but any newly recorded term should)
- Recording of an adverse drug reaction/drug intolerance/allergic drug reaction in a specific ADR recording area

For these situations, system providers may present users an option to just record the information, or both record the information and submit a Yellow Card. This allows a reduction in prompting to report a Yellow Card every time an allergy or intolerance or adverse reaction is recorded.

Other triggers which **may** be included are

- A fatality due to adverse drug reaction/drug intolerance/allergic drug reaction (where a link between the fatality and reaction has been entered into the system by a user.)
- On a difference between admission and discharge medicine information (requirement does not apply to systems outside secondary/tertiary care)
- On admission, reason recorded as due to adverse drug reaction/drug intolerance/allergic drug reaction (requirement does not apply to systems outside secondary/tertiary care)

Yellow Cards are not be expected to be sent in after import of patient data from external sources, for example as a result of GP2GP record import or similar.

[7] https://isd.digital.nhs.uk/trud3/user/guest/group/0/home

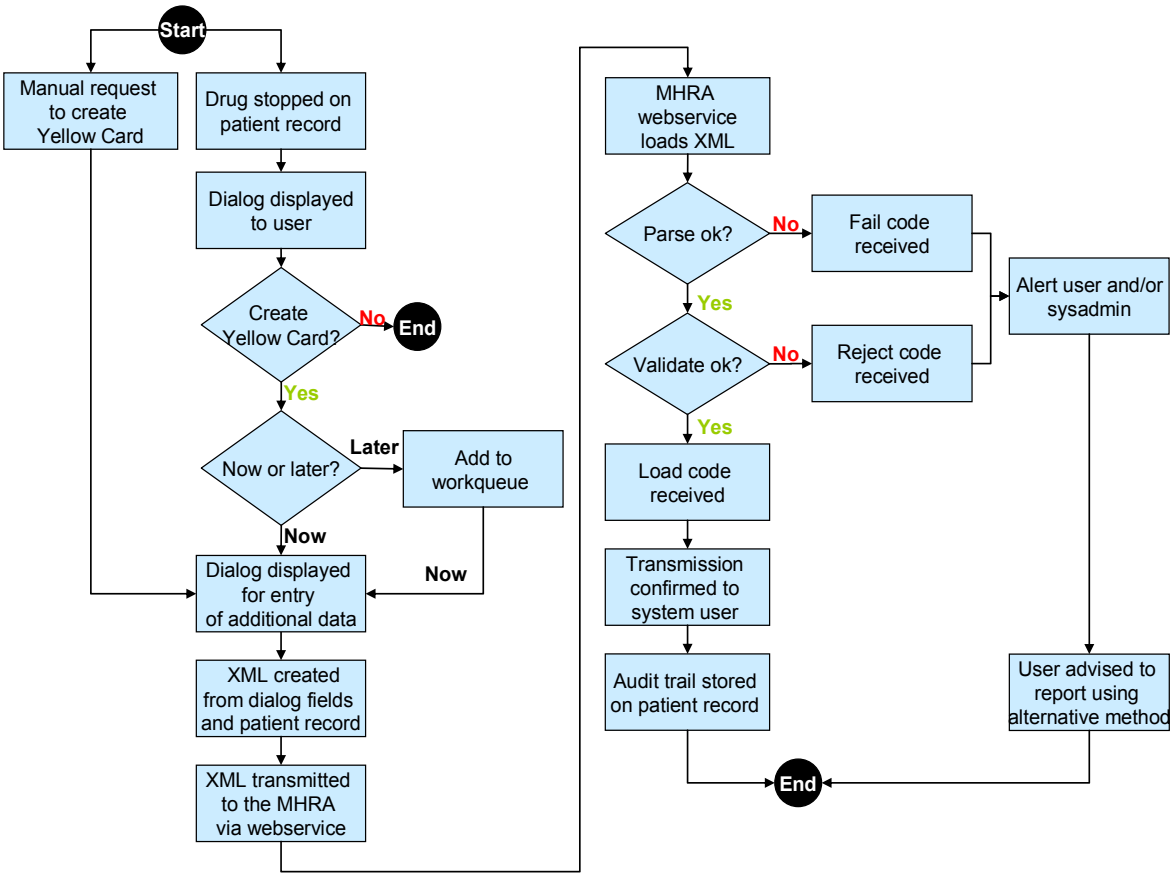
5.5 Typical Workflow

A typical workflow for creation and transmission of an electronic Yellow Card is as follows:

1. Upon a trigger, a user is displayed a dialogue, asking if they want to submit a Yellow Card.
2. On agreeing to submit a Yellow Card, the user can decide to either complete the Yellow Card immediately or be able to record an intention to complete a Yellow Card later. If the Yellow Card is to be completed later, a method is in place to remind the user to do this.
3. Once the user starts to complete a Yellow Card, the system populates information automatically from the patient record – patient information, reporter details, patient medical history and medication information.
4. A further dialogue or dialogues, or other method for allowing data capture is used to complete the Yellow Card details which cannot be derived automatically – selection of suspect medication(s), selection of reaction medical term(s), entry of additional medicines (e.g. those obtained from other sources such as a hospital, over-the-counter in a pharmacy, the internet etc), optional entry of free text describing the adverse reaction, patient history, and relevant tests.
5. The user completes any dialogue(s) and is also able to review and amend information populated automatically.
6. The clinical system then creates an XML message from the fields on the dialogue and the patient record.
7. The XML is then transmitted directly to the MHRA via the webservice as soon as possible and on the same day of creation.
8. The clinical system detects the webservice response code, which should be received within 10 seconds. This tells the user whether the Yellow Card submission was successful or failed.
9. If successfully received and processed, this is confirmed to the user. A record of the transaction and result are stored for audit. The XML sent is added to the patient record unless all the data is stored and the XML can be regenerated. A text version of the message is made available to the reporter either from a stored copy, or a readable version which is created on-the-fly for reading or printing if required.
10. If an XML message is rejected due to an error, the user is made aware of this fact using a method appropriate to the system. This may be through adding an item to a work queue or by notifying a user, local administrator, or system administrator. The reporter is advised to report on the Yellow Card website or print the Yellow Card to pdf and email it to pharmacovigilance@mhra.gov.uk, or post to FREEPOST YELLOW CARD (no other address details necessary).
11. If the webservice is not available, transmission is reattempted at least 3 times over an appropriate time period. This is expected to extend over a time period

greater than 24 hours and must take into account system out-of-hours and weekend downtime. If still unsuccessful, the problem is written to the audit log and brought to a user's attention - this may be through adding an item to a work queue or by notifying a user, local administrator, or system administrator. The user is advised to report on the Yellow Card website or print the Yellow Card to pdf and email it to pharmacovigilance@mhra.gov.uk or post to FREEPOST YELLOW CARD (no other address details necessary).

Figure 1 – Workflow for creation and transmission of a Yellow Card



5.6 Clinical Scenarios

Yellow Card creation triggered on user request

A clinician witnesses an event in a patient and considers it to be an ADR. The patient explains they have been taking a medicine obtained from the internet – 'WonderMed Capsules'. The clinician requests a Yellow Card report is created from the clinical system. The Yellow Card is pre-populated with patient characteristics and the reporter contact details automatically. In addition all medications currently on repeat prescription and any discontinued repeat or acute medication prescribed to a patient in the three months prior to the date of the Yellow Card creation are entered automatically. Medical history entries recorded in the past year are also automatically populated. The clinician is shown a dialogue for entering additional information and chooses to manually enter 'WonderMed' as this is not available in dm+d before highlighting it as the suspect medicine. The clinician enters additional

medications and herbal supplements that the patient informs the doctor they are taking since these are not stored in the patient record. After this a suspect reaction is entered using a clinical terminology which is automatically mapped to a SNOMED CT term for population in the XML message. After being provided the option to review/update and complete any additional available information the Yellow Card is sent to the MHRA webservice and a record of the submission activity and acknowledgment of success is stored on the patient record. A copy of the XML message and a human readable version of the message are both stored in the MHRA system.

Recording of an adverse reaction term in the patient record or a specific adverse reaction recording area

A clinician records a patient's account of a previous event which is considered to be an ADR. On recording this in the patient record or in a specific ADR recording area, the clinician is shown a prompt suggesting this should be as a Yellow Card. When the clinician agrees, a Yellow Card is pre-populated with patient characteristics and the reporter contact details automatically. The suspect reaction is mapped from the clinical terminology term entered in the patient record into SNOMED CT and populated in the message. In addition all medications currently on repeat prescription and any discontinued repeat or acute medications prescribed to a patient in the three months prior to the date of the Yellow Card creation are entered automatically. Medical history entries recorded in the past year are also automatically populated. The clinician is shown a dialogue and indicates which medicine or medicines are suspect. The clinician chooses two suspect reactions using a clinical terminology which is automatically mapped to a SNOMED CT term for population in the XML message. After being provided the option to complete any additional available information the Yellow Card is sent to the MHRA webservice and a record of the submission activity and acknowledgment of success is stored on the patient record. A copy of the XML message and a human readable version of the message are stored in the MHRA system.

5.7 Other Implementations

The MHRA is in regular contact with other medicine regulators around the world. Although many other regulators collect adverse drug reaction data electronically through websites, there is little evidence of any other developments using E2B(R2) message based electronic adverse drug reaction reporting elsewhere in Europe.

Other European regulators have developed direct links with hospital based systems for receiving adverse drug reaction reports, but these have been on a small scale and have not used a standard messaging format. Unfortunately, published information on these pilots does not appear to be available.

In the USA, the Children's Hospital Boston, Harvard Medical School, and the University of North Carolina have developed a smart-phone application for electronically reporting into the MedWatch database[8]. However, it is not clear how adverse drug reactions are transmitted into the database.

[8] http://www.healthmap.org/site/projects/medwatcher

6 Definition of the Standard

6.1 Information Specification

Please see the spreadsheet DCB1582 electronic Yellow Card message fields and validations v3.0 for a definition of the message field values, data requirements and validations.

6.2 Requirements

#	Requirement
1	A user **MUST** be able to manually request a Yellow Card is created for a specific patient.
2	The system **MUST** prompt a user to report a Yellow Card when a medication previously on repeat-prescription is stopped when a user confirms a patient experienced an adverse drug reaction/drug intolerance/allergic drug reaction. (See sections 11 and 12 for SNOMED CT triggers)
3	The system **SHOULD** prompt a user to report a Yellow Card when an adverse drug reaction/drug intolerance/allergic drug reaction is recorded using a medical terminology. Systems may provide users the option to record without triggering a Yellow Card, or both record and trigger a Yellow Card (See sections 11 and 12 for SNOMED CT triggers)
4	The system **SHOULD** prompt a user to report a Yellow Card when an adverse drug reaction/drug intolerance/allergic drug reaction is recorded in a specific ADR recording area. Systems may provide users the option to record without triggering a Yellow Card, or both record and trigger a Yellow Card (See sections 11 and 12 for SNOMED CT triggers)
5	The system **MAY** prompt a user to report a Yellow Card when a fatality due to adverse drug reaction/drug intolerance/allergic drug reaction is recorded using a medical terminology.
6	The system **MAY** prompt a user to report a Yellow Card when a difference between admission and discharge medicine information is recognised (requirement does not apply to primary care systems)
7	The system **MAY** prompt a user to report a Yellow Card when on admission, reason recorded as due to adverse drug reaction/drug intolerance/allergic drug reaction is recorded (requirement does not apply to primary care systems)
8	The system **SHOULD** allow a user to either complete the Yellow Card immediately or be able to record an intention to complete a Yellow Card at a later stage.
9	If a user selects an option to complete a Yellow Card at a later stage, an automated system for reminding the user **MUST** be in place.
10	After the user requests that a Yellow Card be created, the system **MUST** provide a method for user entry of information which cannot be populated automatically from the patient record including reaction start and stop dates, additional medications and free-text information on reaction narrative, patient history and relevant tests.
11	A user **MUST** be able to retrieve a Yellow Card previously completed by entering the safetyreportid so that additional information on the patient or adverse drug reaction may be provided to the MHRA on request. (Responses to follow up information requests are not via transmission of an electronic Yellow Card message). The search function should span across the organisation (e.g. surgery) in order to identify the Yellow Card. The system should list all previously submitted Yellow Cards.
12	When a Yellow Card has been processed and transmitted to the MHRA webservice and an acknowledgement received, the local audit trail **MUST** include an entry reflecting this.

#	Requirement
13	The Yellow Card XML message and a human readable version **MUST** be either stored in the patient record, or reproducible from data held in the system.
14	A Yellow Card **MUST** be transmitted to the MHRA webservice as soon as possible once it is created.
15	If an XML is rejected due to an error, the user **MUST** be made aware of this fact using a method appropriate to the system. This may be through adding an item to a work queue or by notifying a user, local administrator, or system administrator. The reporter is advised to report on the Yellow Card website or print the Yellow Card to pdf and email to pharmacovigilance@mhra.gov.uk, or post to FREEPOST YELLOW CARD (no other address details necessary)
16	The transmission **MUST** be reattempted if the webservice is not available: transmission should be reattempted at least 3 times over an appropriate time period. This is expected to extend over a time period greater than 24 hours and must take into account system out-of-hours and weekend downtime. If still unsuccessful, the problem is written to the audit log and brought to a user's attention - this may be through adding an item to a work queue or by notifying a user, local administrator, or system administrator. The user is advised to report on the Yellow Card website or print the Yellow Card to pdf and email it to pharmacovigilance@mhra.gov.uk or post to FREEPOST YELLOW CARD (no other address details necessary)
17	A system **MUST** create electronic Yellow Cards using the defined xml format using the ISO-8859-1, UTF-8 or UTF-16 character sets.
18	Medical terms **MUST** be populated using SNOMED CT term concept IDs or MedDRA Lower Level Terms IDs (LLTs). Read V2, Read V3 or CTV3 terms **MUST** first be mapped to SNOMED CT concept IDs using a NHS TRUD cross-map. Where no mapping exists, the MedDRA LLT code '10052538' for 'Adverse drug reaction NOS' **MUST** be populated.
19	Yellow Cards transmitted as an XML file to the Yellow Card webservice **MUST** parse against the DTD in order to be accepted.
20	Data field values **MUST** meet data validation requirements. These are listed in DCB1582 electronic Yellow Card message fields and validations and can be checked using the webservice ValidateE2B function.
21	The Yellow Card **MUST** have the patient age at time of reaction and sex automatically populated from the patient record when this is present in the patient record.
22	A Yellow Card **SHOULD** automatically populate patient weight and height when a current value is present in the patient record.
23	A Yellow Card **MUST** automatically populate patient medical history recorded in the past year (i.e. date recorded is within one year of the Yellow Card creation date). The medical history terms **MUST** be populated using SNOMED CT Concept IDs or MedDRA LLTs. (Refer to requirement 18 for more details).
25	A Yellow Card **MUST** be automatically populated with reporter name, address, telephone and email from the information held within the system.
26	All current repeat medications and any discontinued repeat or acute medication prescribed to a patient in the three months prior to the date of the Yellow Card creation date **MUST** be populated using dm+d entries, using the most detailed term level available (AMP>VMP>VTM>Active substance) . For any repeat medications, this should be limited to one entry with the initiation date.
27	A user **MUST** also be able to enter a suspect or concomitant medicine using free text where dm+d cannot provide a suitable term. For example: an unlicensed medicine purchased on the internet.

#	Requirement
28	The user **MUST** select one or more medicines to indicate a suspicion of having caused (i.e. may have caused) the adverse drug reaction. The number of suspect medicines **MUST NOT** be limited to any number.
29	A Yellow Card **MUST** include at least one or more suspect reactions (coded using SNOMED CT concept IDs or MedDRA LLTs) and a reaction outcome for every reaction as selected by the user. (The list of outcome values is provided in DCB1582 electronic Yellow Card message fields and validations. Reaction outcome MUST be populated as 'unknown' if not known or is not available to the reporter). The number of suspect reactions **MUST NOT** be limited to any number.
30	For all suspect and concomitant medicine/drug entries populated, a Yellow Card **SHOULD** automatically include route of administration, dose, start and stop dates, and indications when available from the patient record.

6.3 Conformance Criteria

This section describes the tests that can be measured to indicate that the information standard is being used correctly by an organisation (conformance criteria).

#	Conformance Criteria
1	The IT system is able to transmit the ExampleICSR v3 0.xml and ExampleICSRfail v3 0.xml messages to the MHRA webservice and receive the correct response.
2	The IT system can generate a XML message from data held in the test environment and data entered by a user, it meets the minimum validation and all parsing requirements. It is able to be transmitted to the MHRA webservice to receive the correct response.
3	The IT system can generate a XML message from data held in the test environment and data entered by a user. When the suspect drug is not available in dm+d, it is entered manually by a user. It is able to be transmitted to the MHRA webservice to receive the correct response.
4	The IT system can generate a fully populated XML message including repeated blocks for patient medical history, medications and reactions from data held in a test environment and data entered by a user. It meets validation and parsing requirements and can be transmitted to the MHRA webservice to receive the correct response.
5	The IT system can generate a fully populated XML message from data held in the test environment and data entered by a user, including all current repeat medications and any acute medication prescribed to a patient in the three months prior to the date of the Yellow Card creation date.
6	The Yellow Card XML message output corresponds to the information input from the system automatically and that added manually by the user.
7	The IT System has function to enable all users to manually request a Yellow Card for a specific patient.
8	The IT system automatically prompts the user to complete an adverse drug reaction report when a medication previously on repeat-prescription is stopped and a user confirms a patient experienced an adverse drug reaction/drug intolerance/allergic drug reaction.
9	When a user selects an option to complete a Yellow Card at a later stage, an automatic system for reminding the user is in place.

#	Conformance Criteria
10	After the user requests that a Yellow Card be created, the system provides a method for user entry of information which cannot be populated automatically from the patient record including reaction start and stop dates, medicines not available from dm+d, additional medications and free-text information on reaction narrative, patient history and relevant tests.
11	The IT system user can retrieve a Yellow Card previously completed by searching on the safetyreportid to provide additional information on the patient or adverse drug reaction when requested by the MHRA. The search function covers the whole organisation. The safetyreportid is unique and identifiable (e.g. electronically traceable).
12	The IT system includes an entry in the audit trail when a Yellow Card is generated and transmitted.
13	A Yellow Card XML message and a human readable version is available to the user. The human readable version reflects all information populated in the Yellow Card Message.
14	The system can create electronic Yellow Cards using the defined xml format using the ISO-8859-1, UTF-8 or UTF-16 character sets.
15	Medical terms are populated using SNOMED CT term concept IDs or MedDRA Lower Level Terms IDs (LLTs). If used, Read V2, Read V3 or CTV3 terms are first mapped to SNOMED CT concept IDs using a NHS TRUD cross-map. When no mapping exists, the MedDRA LLT code '10052538' for 'Adverse drug reaction NOS' is populated.
16	The Yellow Card has the patient age at the time of reaction and sex automatically populated from the patient record when this is present in the patient record.
17	A Yellow Card is automatically populated with reporter name, address, telephone and email from the information held within the system.
18	All current repeat medications and any discontinued repeat or acute medication prescribed to a patient in the three months prior to the date of the Yellow Card creation date are populated using dm+d entries, using the most detailed term level available (AMP>VMP>VTM>Active substance). For any repeat medications, this is limited to one entry with the initiation date.
19	The system enables the user to enter suspect and concomitant medicines using free text when dm+d cannot provide a suitable term.
20	The system enables the user to select one or more medicines to indicate a suspicion of having caused (i.e. may have caused) the adverse drug reaction. The number of suspect medicines is not limited.
21	A Yellow Card includes at least one or more suspect reactions (coded using SNOMED CT concept IDs or MedDRA LLTs) and a reaction outcome for every reaction as selected by the user. (It follows the list of outcome values is provided in DCB1582 electronic Yellow Card message fields and validations v3.0. Reaction outcome is populated as 'unknown' if not known or is not available to the reporter). The number of suspect reactions is not limited to any number.
22	The IT system can reattempt transmission if the webservice is not available: retransmission can be reattempted at least 3 times over an appropriate time period (over a period greater than 24 hours and takes into account out-of-hours and weekend system downtime). If still unsuccessful, the problem is written to the audit log and brought to the user's attention - this is through adding an item to a work queue or by notifying a user, local administrator, or system administrator. The user is then advised to report using alternative methods.
23	If an XML is rejected due to an error, the user is made aware of this fact using a method appropriate to the system. This may be through adding an item to a work queue or by notifying a user, local administrator, or system administrator. The user is then advised to report using alternative methods.

6.4 SNOMED CT Representations of Adverse Drug Reaction

SNOMED CT representations of adverse reactions have previously been defined through event and condition information components in Appendix 1 and 2 of NPFIT-EP-DB-0007.04 *Representation in Electronic Patient Records of Allergic Reactions, Adverse Reactions, and Intolerance of Pharmaceutical Products*. The SNOMED CT terms identified are listed in the Appendices to define the triggers for creating a Yellow Card.

7 Yellow Card Webservice

This section gives a brief overview of the services offered by the Yellow Card webservice:

The created xml file is submitted to a webservice which has been implemented using Simple Object Access Protocol (SOAP). The web service definition can be found at the following location:

https://ehr-services.mhra.gov.uk/v2/SubmissionService.asmx?WSDL

Two operations are supported:

- **ValidateE2B** – validation rules are applied to the Yellow Cards submitted, however the Yellow Card is not saved by the webservice into the MHRA system.
- **UploadE2B** – Yellow Cards submitted are first passed through the validation steps after which the data is saved into the MHRA system.

Both operations return a response with two properties:

A. Validation Errors

This property will highlight any fields within the report that failed validation. Each validation error will contain the following properties:

- SafetyReportID – This is the safetyreportid of the report that raised this current validation error.
- FieldName – This is the name of the field that failed validation.
- ValidationMessage – This is a text description of the validation error.
- Severity – This is a description of the severity of the validation error. There are currently two severities that may be returned:
    - Error – This validation error has prevented the report from being saved into the MHRA system
    - Warning – This report has been accepted by the MHRA system and no further action is necessary

B. Success

This is a Boolean property determining whether the submitted reports are valid. If any reports fail validation then this will return false.

Example SOAP 1.1 and SOAP 1.2 requests and responses are available at https://ehr-services.mhra.gov.uk/v2/SubmissionService.asmx?op=UploadE2B and https://ehr-services.mhra.gov.uk/v2/SubmissionService.asmx?op=ValidateE2B.

The webservice URLs are as follows:

Testing: https://ehr-services.mhra.gov.uk/uat/SubmissionService.asmx
Production (secure http): https://ehr-services.mhra.gov.uk/v2/SubmissionService.asmx

7.1 Webservice Security

Secure Sockets Layer (SSL) cryptographic protocol is used to encrypt the network connection over which the Yellow Card data is transmitted using a 128 bit key, via Secure Hypertext Transfer Protocol (HTTPS).

Systems providers must obtain a username and password for access to the webservice. This will be only one username and password per system provider and should be requested from pharmacovigilanceservice@mhra.gov.uk.

Submissions of data sent without correct username and password authentication will not receive a response nor will they be processed by the webservice.

Except for the response message received on transmission of an electronic Yellow Card, it is not possible to retrieve any other data through the webservice.

7.2 Webservice Support

Systems providers experiencing problems with the webservice should contact pharmacovigilanceservice@mhra.gov.uk, or call 020 3080 6764.

8 Testing

Testing should encompass actions within the clinical system, as well as ensuring the Yellow Card report is a correctly structured xml file. Full end-to-end testing must be included to ensure a test Yellow Card can be loaded into the MHRA system. It is also important that some realistic example scenarios are used during testing.

Validation rules enforced by the webservice aim to ensure data submitted meets data quality requirements.

The following scenarios and activities must be tested:

- Generation of a Yellow Card – manual request
- Triggering dialogue asking if a Yellow Card should be created – patient record entry
- Triggering dialogue asking if a Yellow Card should be created – ADR record area entry (if an ADR record area is present in the specific system)
- Triggering dialogue asking if a Yellow Card should be created – confirmed ADR/allergy on stopping a repeat prescription.
- Automated population of data from system and patient record
- Population of data by user for a medicine not prescribed or held in the patient record (i.e. an unlicensed medicine bought off the internet)
- Manual addition of data for fields not populated automatically
- Transmission to MHRA via webservice and acknowledgment loop
- Handling failure to access the webservice
- Ability to retrieve a Yellow Card by searching for the safetyreportid
- Reconciling numbers of Yellow Cards sent from a system to the MHRA – by providing the MHRA a list of Yellow Card <messagesenderidentifier> values from Yellow Cards transmitted.

In addition, testing must include transmission of maximally populated ICSRs to the MHRA webservice, i.e. where all possible fields are completed.

- Maximally populated ICSR
- Fatal reaction
- Reaction in child
- Including patient history
- Including tests
- Including multiple adverse reactions
- Including multiple suspect drugs

Two test message files are provided, which may be used to test transmission to the webservice:

Filename	Description
ExampleICSR v3 0.xml	A fully completed example which meets validation requirements.
ExampleICSRfail v3 0.xml	An example which fails validations due to: <patientheight> • patientheight: is longer than 3 characters <drugcharacterization> • At least one drug with a drugcharacterization of 1 (Suspect) must be provided <drugstartdate> • drugstartdate must not be in the future. • A drugstartdate may not be after the latest reactionstartdate • A reactionstartdate may not be before the earliest drugstartdate • A drugstartdate may not be after the patientdeathdate

9 Maintenance Plan - Updating the E2B(R2) International Standard

ICH E2B(R2) guidelines are currently undergoing an update process. The ICH Steering Committee decided that technical specifications should no longer be developed solely within ICH, but should be created in collaboration with Standards Development Organisations (SDOs) to enable wider inter-operability across the regulatory and healthcare communities. The E2B(R3) is the first topic to go through this process.

The International Organisation for Standards (ISO), Health Level 7 (HL7) and European Committee for Standardization (CEN) have collaborated to form the Joint Initiative on SDO Global Health Informatics Standardization through which a single, common standard for the ICSR could be advanced. Subsequently, the Clinical Data Interchange Consortium(CDISC), the International Health Terminology Standards Development Organisation (IHTSDO) and GS1 have also become members of this Joint Initiative. ICH representatives have been heavily involved in this initiative in addition to other experts from beyond the ICH community. The overall standard is based upon the HL7 ICSR model that is capable of supporting a wide range of product types (e.g. human medicinal products, veterinary products, medical devices etc.) The framework is described in:

> ISO/HL7 27953-1:2011 Health informatics -- Individual case safety reports (ICSRs) in pharmacovigilance -- Part 1: The framework for adverse event reporting

The second part of the standard defined the details of the reporting requirements for human pharmaceuticals:

> ISO/HL7 27953-2:2011 Health informatics -- Individual case safety reports (ICSRs) in pharmacovigilance -- Part 2: Human pharmaceutical reporting requirements for ICSR

It is envisaged that at some time in the future the standard will be extended by the addition of other parts applicable to different product types.

The standards have been published as international standards and will be implemented for transmission of adverse drug reaction reports in the near future. However, E2B(R2) will continue to be used for some years, allowing a transition period so that pharmaceutical companies and regulators are able to update their databases and messaging to use E2B(R3).

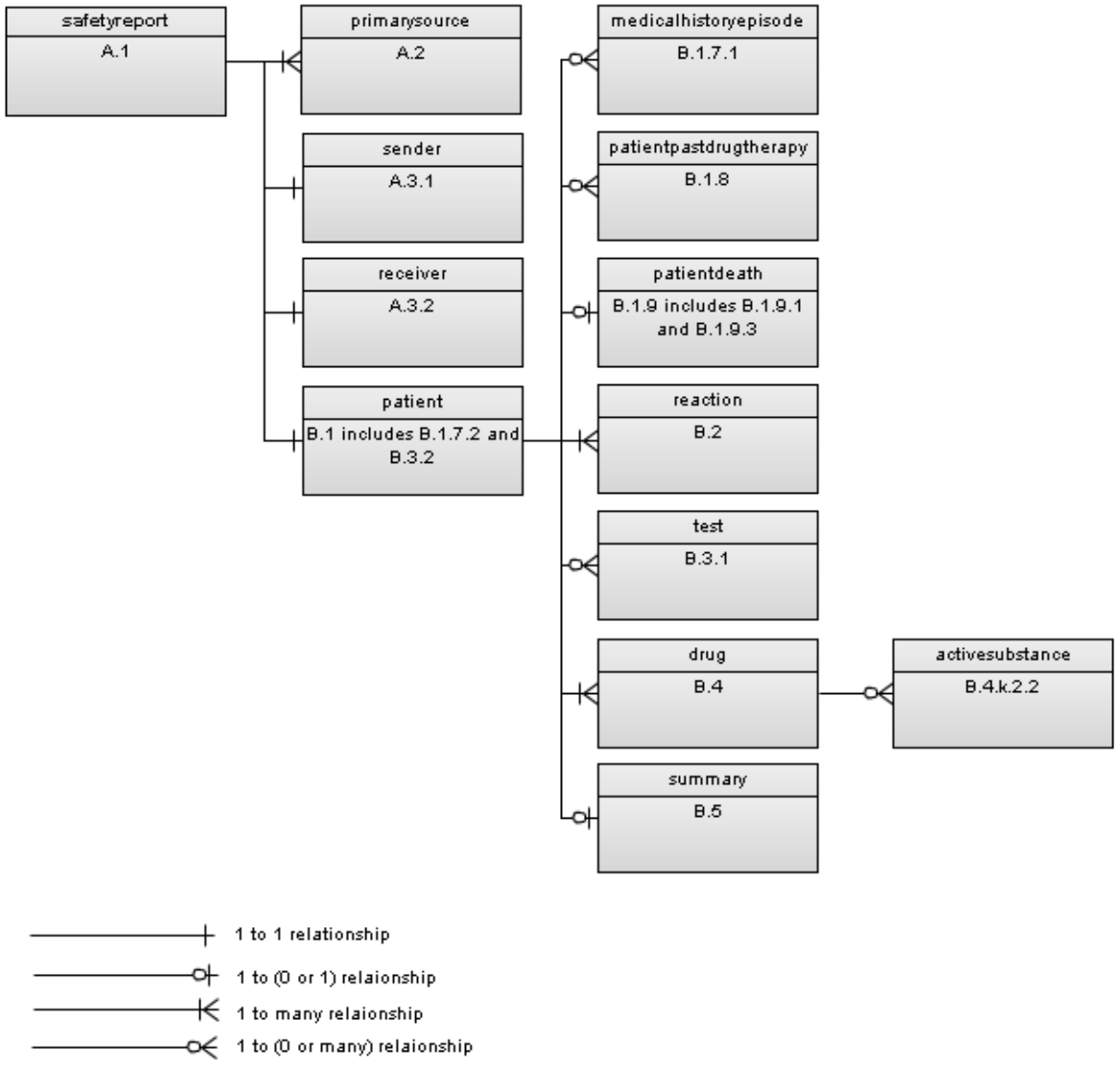
Although the standard uses HL7 messaging which is already used for many applications in the NHS, using E2B(R3) as the basis for electronic Yellow Card reporting will introduce a significant delay. This is considered a significant disadvantage as a standard for electronic Yellow Card reporting will make a significant step in improving access to and ease of Yellow Card reporting. In addition, experience of use of the new standard in adverse drug reaction reporting is currently limited and this introduces additional risks to the project.

The MHRA will monitor the implementation of E2B(R3) and make a decision on updating the electronic Yellow Card reporting standard once usage is more firmly established.

10 Supporting Information

10.1 Unified Modelling Language (UML) Model

This section provides a data model for the xml message.



10.2 Example

Please see the file ExampleICSR v3 0.xml for an example completed ICSR file which meets validation requirements.

11 SNOMED CT terms as triggers for creating a Yellow Card

The following table describes the suggested SNOMED CT representations of the event and condition information components which should be used to meet the Yellow Card trigger requirements. It may be necessary to map these back to the terminology used within the clinical system (e.g. Read V2, Read V3 or CTV3) in order to identify relevant trigger clinical terms.

Trigger	SNOMED CT Concept term name	SNOMED CT Concept term ID
Adverse drug reaction*	Adverse reaction to drug (disorder)	62014003
Allergic drug reaction	Allergic reaction to drug (disorder)	416093006
Anaphylaxis to drug/ Anaphylactic reaction to drug	Drug-induced anaphylaxis (disorder)	241937000
Anaphylactoid reaction to drug	Drug-induced anaphylactoid reaction (disorder)	241947002
Propensity to adverse reaction to drug	Propensity to adverse reactions to drug (disorder)	419511003
Intolerance to drug*	Drug intolerance (disorder)	59037007

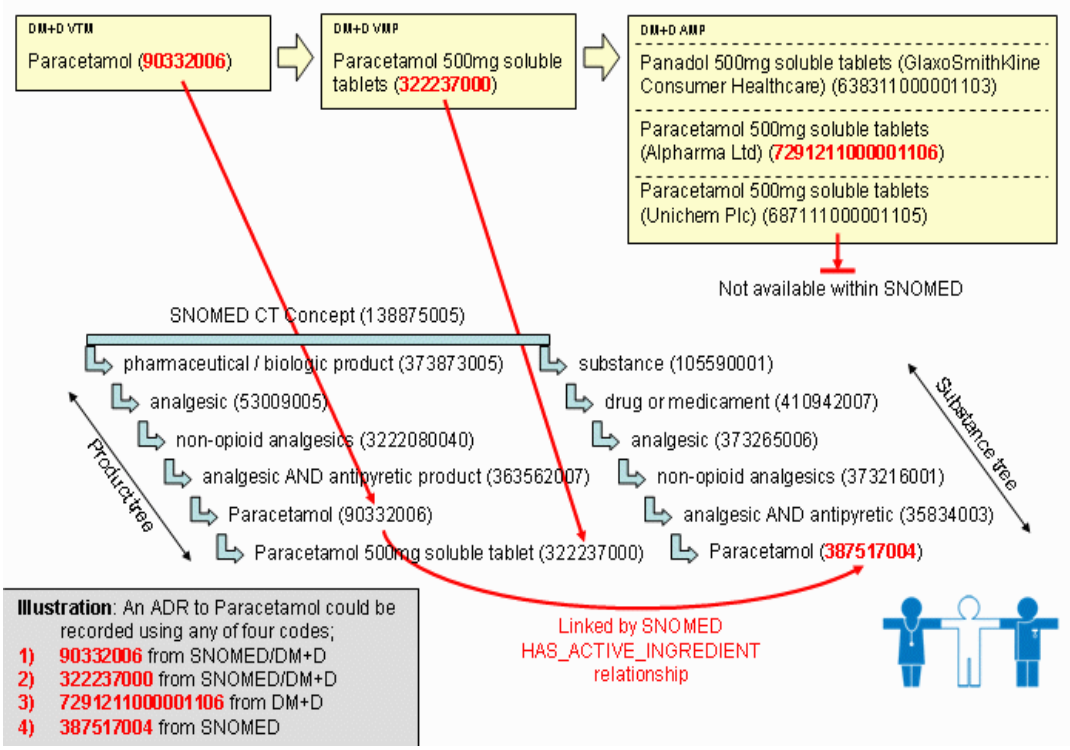
These values are not specifically for population in the reaction section of the Yellow Card message. A user selects clinical terms to populate the reaction information in the Yellow Card message and is also able to enter a free text description.

For details of the Yellow Card message content please refer to DCB1582 electronic Yellow Card message fields and validations v3.0 and the example ICSR files ExampleICSR v3 0.xml and ExampleICSRfail v3 0.xml.

12 Recording ADRs using dm+d and/or SNOMED CT

The following illustration shows how either a dm+d or SNOMED CT codes can be used to record an adverse reaction, allergy or intolerance to Paracetamol.

In the illustration, only a subset of the available dm+d AMPs are shown.



13 Impact of the Yellow Card Scheme

The following table shows some of the safety issues which Yellow Card reports have helped identify:

Year	Medicine	Adverse Reaction	Resulting action or advice
September 2016	Posaconazole (Noxafil)	Tablets and oral suspension are not directly interchangeable	Strengthened product information warnings to clarify the oral solution cannot be substituted for the oral tablet, or vice versa, at the same dose. The outer packaging was changed to better distinguish the difference in the two formulations. Drug Safety Update (DSU) article published
June 2016	Dexamethasone and Ritonovir	Drug interaction: increase the risk of systemic adrenal effects	Strengthened product information warnings detailing the drug interaction of systemic adrenal effects
April 2016	Natalizumab (Tysabri▼)	Progressive Multifocal Leukoencephalopathy (PML)	Strengthened product information warnings about PML including risk factors and risk minimisation measures. A direct healthcare professional communication (DHPC) was sent out to healthcare professionals to highlight the importance of monitoring through testing patients every 6 months to reduce risk of PML
December 2015	Cobicistat and fluticasone	Drug interaction: increase the risk of adrenal suppression	Strengthened product information warnings about the drug interaction increasing the risk of adrenal suppression after this was raised through the EU system. DSU article published
November 2014	Gaviscon Infant	Constipation	Strengthened product information warnings of constipation
October 2014	Proton Pump Inhibitors (PPIs)	Subacute cutaneous lupus erythematosus (SCLE), a nonscarring dermatosis that can develop in sun-exposed areas	Strengthened product information warnings of SCLE, including information for healthcare professionals and patients or carers about lesions especially in sun-exposed areas of the skin and accompanied by arthralgia. DSU article published

September 2014	Pregabalin	Abuse, misuse and dependence	Strengthened product information warnings regarding abuse, misuse and dependence
July 2014	Fentanyl patches	Life threatening harm from accidental exposure	Reminder of potential for life threatening harm from accidental exposure from swallowing or transfer to other individuals, particularly in children
March 2014	St John's wort (*Hypericum perforatum)* and hormonal contraceptives medicines and implants	Interaction resulting in reduced contraceptive effect	Reminder about herbal products that contain St John's wort and the interaction with hormonal contraceptives
September 2013	Filgrastim and pegfilgrastim	Life-threatening capillary leak syndrome (CLS)	Precaution to monitor patients and healthy donors for signs and symptoms of CLS, and give standard symptomatic treatment immediately if symptoms occur
Aug 2011	Lei Gong Teng (*Tripterygium wilfordii*)	Risk of serious side effects	Healthcare professionals are asked to remain vigilant and advise anyone currently using this product to stop taking it
Jan 2011	Sitaxentan (Thelin)	Hepatotoxicity	Worldwide withdrawal from the market

14 Mapping of SNOMED CT to MedDRA terms and dm+d to MHRA drugs dictionary

Under European pharmacovigilance legislation, medical terms coded into E2B ICSRs transmitted between regulators and the pharmaceutical industry must use MedDRA. Use of MedDRA is almost solely for transmission of adverse drug reaction reports for pharmaceutical regulatory purposes. As MedDRA is therefore not used in clinical systems or elsewhere in the NHS, this standard specifies that medical terms in electronic Yellow Cards should be coded using SNOMED CT concept IDs.

Dm+d is the NHS dictionary of medicines and devices used in clinical systems. The MHRA has its own drugs dictionary. The MHRA is expecting to receive increasing volumes of reports from clinical systems, in these reports the drugs may be identified using the names from any of the three levels of the dm+d dictionary. It was identified that the dm+d drug terms were not compatible with MHRA drugs dictionary terms and would require manual population of the drug terms.

The MHRA has undertaken a process to build up a mapping between both SNOMED CT concept terms and MedDRA lower level terms and dm+d terms and MHRA drugs dictionary terms for Yellow Cards received from clinical systems. **These mappings are for MHRA internal use only.**

SNOMED CT mapping project

A set of principles were drafted for clinical classification cross-mapping for the UK edition of SNOMED CT, however no specific guidelines or principles on mapping of terminology to terminology were available. The MHRA performed a mapping for the most commonly coded MedDRA terms (for example the 1000 most frequently used terms). A representative from the MedDRA maintenance organisation, MedDRA MSSO, monitored this process.

dm+d mapping project

A mapping of over 135000 medicinal terms from the dm+d dictionary to the MHRA's Drugs Dictionary was created to enable automatic processing of these reports and standardise coding practices. As the MHRA drugs dictionary is unique there were no specific guidelines in place however as with the SNOMED CT mapping project, a set of principles were drafted and data validated internally.

Once these initial stages were completed an internal process was developed to convert SNOMED CT codes into MedDRA LLT codes and dm+d terms into MHRA drugs dictionary terms before processing through the MHRA pharmacovigilance database. Yellow Cards received where the codes/terms have not been mapped fall into a staging area. This area is monitored on a daily basis by a team of Signal Assessors who perform coding of adverse drug reactions and Yellow Cards on a daily basis. Once a suitable term is selected, it is stored as a mapping for any future Yellow Cards.

In order that no information is lost at any mapping stage the original term names (from the terminology used in the clinical system) is collected in the Yellow Card message.

A quality audit process is being introduced to ensure mapping of terms between SNOMED CT and MedDRA/dm+d and MHRA drugs dictionary are appropriate.

