The Changing World of Pharmacovigilance

June M Raine  Director of Vigilance and Risk Management Division
Changing World of Pharmacovigilance

Where have we come from?
- Learning from landmark safety issues
- From reactive to proactive risk management

What is current state of play?
- Strengthened signal detection
- Using real world evidence to contextualise

How are we moving forward?
- Key challenges and opportunities
- Focus on physician’s role
What is the MHRA’s role?

Availability of new treatments & technologies without delay

Proactive vigilance based on best evidence and prompt risk management

As much information to patients and healthcare professionals as possible on the benefits and risks
THALIDOMIDE AND CONGENITAL ABNORMALITIES

SIR,—Congenital abnormalities are present in approximately 1·5% of babies. In recent months I have observed that the incidence of multiple severe abnormalities in babies delivered of women who were given the drug thalidomide (‘Distaval’) during pregnancy, as an anti-emetic or as a sedative, to be almost 20%.

These abnormalities are present in structures developed from mesenchyme—i.e., the bones and musculature of the gut. Bony development seems to be affected in a very striking manner, resulting in polydactyly, syndactyly, and failure of development of long bones (abnormally short femora and radii).

Have any of your readers seen similar abnormalities in babies delivered of women who have taken this drug during pregnancy?

Hurstville, New South Wales.

W. G. McBRIDE.
Sir Derrick Dunlop 1964

Letter to all UK doctors

We ask you to report promptly to us details of any untoward condition in a patient which might be the result of drug treatment

Yours sincerely,

[Signature]
Yellow Card Scheme

Yellow Card Scheme

If you suspect an adverse reaction may be related to one or more drug(s)/vaccine(s), please complete this Yellow Card. To report adverse reactions to drugs, vaccines and biologics, please visit: https://www.yellowcard.gov.uk

Patient Details
- Patient initials
- Sex: M / F
- Ethnicity
- Weight if known (kg)
- Age at time of reaction
- Identification number (e.g. Your Practice or Hospital Ref.)

Suspected Drug(s)/Vaccine(s)
- Drug/Vaccine (Brand if known)
- Batch
- Route
- Dosage
- Date started
- Date stopped
- Prescribed for

Suspected Reaction(s)
- Please describe the reaction(s) and any treatment given:

If you think the medicine you are taking may have caused a side effect, you can report it using Yellow Card.
Commission on Human Medicines

Promoting collection and investigation of information relating to adverse reactions

Chairman Professor Stuart Ralston
Pharmacovigilance – a definition

“Pharmacovigilance is the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other medicine related problem”
Pharmacovigilance cycle

- **Monitor risk minimisation effectiveness**
- **Signal detection in real world use**
- **Better characterised risks of medicine**
- **Ongoing evaluation of benefit risk**
- **Risk minimisation, communication, maintain favourable benefit risk**
Evolution of pharmacovigilance

1. Spontaneous case reports “Yellow Card”

2. Epidemiological data for exposure, statistical signal detection

3. Proactive risk management, patients report ADRs

4. Continuous benefit risk monitoring, health outcomes
Public health impact of ADRs

6.5% hospital admissions in UK relate to adverse drug reactions

ADRs were responsible for death in 0.15%

72% were classified as avoidable

*Pirmohamed et al 2004
BMJ 329; 15-19*
Number of Patients Studied Prior to Approval of New Medicines: A Database Analysis

Ruben G. Duijnhooven\textsuperscript{1,2}, Sabine M. J. M. Straus\textsuperscript{2,3}, June M. Raine\textsuperscript{4}, Anthonius de Boer\textsuperscript{1}, Arno W. Hoes\textsuperscript{5}, Marie L. De Bruin\textsuperscript{1,2*}

1 Utrecht Institute for Pharmaceutical Sciences, Utrecht University, Utrecht, the Netherlands, 2 Medicines Evaluation Board, Utrecht, the Netherlands, 3 Department of Medical Informatics, Erasmus Medical Center, Rotterdam, the Netherlands, 4 Medicines and Healthcare products Regulatory Agency, London, United Kingdom, 5 Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Utrecht, the Netherlands

Abstract

\textit{Background:} At the time of approval of a new medicine, there are few long-term data on the medicine’s benefit–risk balance. Clinical trials are designed to demonstrate efficacy, but have major limitations with regard to safety in terms of patient exposure and length of follow-up. This study of the number of patients who had been administered medicines at the time of medicine approval by the European Medicines Agency aimed to determine the total number of patients studied, as well as the number of patients studied long term for chronic medication use, compared with the International Conference on Harmonisation’s E1 guideline recommendations.

Duijnhooven et al PLoS March 2013
Patients studied prior to approval of new medicine

For 200 new “standard” medicines between 2000 -2010 median total no patients= 1708, for orphan drugs = 438 patients
For 84 medicines for chronic use 79.8% met guidelines for 12 months (at least 100 participants)
Knowledge of ADRs at licensing

![Graph showing the relationship between time to onset of ADR and frequency of ADR, highlighting the known ADRs at licensing.](image-url)
Filling the knowledge gaps

Unidentified ADRs

Long term safety

Special populations

At risk groups
# “Landmark” safety issues

<table>
<thead>
<tr>
<th>Date</th>
<th>Drug / class</th>
<th>Safety concern</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960’s</td>
<td>Thalidomide</td>
<td>Phocomelia</td>
<td>Withdrawn</td>
</tr>
<tr>
<td>1970s</td>
<td>Practolol</td>
<td>Oculomucocutaneous Syndrome</td>
<td>Withdrawn</td>
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<tr>
<td>1980’s</td>
<td>Benoxaprofen</td>
<td>Phototoxicity</td>
<td>Withdrawn</td>
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<tr>
<td></td>
<td>Aspirin</td>
<td>Reye’s syndrome</td>
<td>Cl in &lt;12’s</td>
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<tr>
<td>1990’s</td>
<td>Oral contraceptives</td>
<td>Venous thromboembolism</td>
<td>Warnings</td>
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<tr>
<td>2000’s</td>
<td>Cerivastatin</td>
<td>Rhabdomyolysis</td>
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<td>HRT</td>
<td>Breast cancer</td>
<td>Restrictions</td>
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<tr>
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<td>SSRIs</td>
<td>Suicidality- children</td>
<td>Cl under &lt;18s</td>
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<tr>
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<td>Coxibs</td>
<td>CVS risk</td>
<td>Warnings</td>
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<tr>
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<td>Rosiglitazone</td>
<td>CVS risk</td>
<td>Suspended</td>
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<tr>
<td></td>
<td>Gadolinium CAs</td>
<td>Nephrogenic dermopathy/ NSF</td>
<td>Warnings</td>
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<tr>
<td>2010s</td>
<td>Pandemrix</td>
<td>Narcolepsy</td>
<td>Cl under &lt;18s</td>
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<td></td>
<td>Natalizumab</td>
<td>PML</td>
<td>Risk minimisation</td>
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<tr>
<td></td>
<td>HPV vaccine</td>
<td>Chronic fatigue syndrome</td>
<td>No evidence</td>
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</tbody>
</table>
BMJ Open  An investigation into drug products withdrawn from the EU market between 2002 and 2011 for safety reasons and the evidence used to support the decision-making

Rhian McNaughton,¹,² Gwenaël Huet,¹ Saad Shakir¹,²

Table 2  List of evidence used to support medicinal product withdrawals in all EU member states between 2002 and 2011 derived from EMA reports, PubMed literature search and websites of competent authorities

<table>
<thead>
<tr>
<th>Drug name</th>
<th>Case report</th>
<th>Animal studies</th>
<th>Case-control</th>
<th>Cohort</th>
<th>RCTs</th>
<th>Meta-analysis</th>
<th>*Others</th>
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<td>Rofecoxib</td>
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<td>Sibutramine</td>
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<td>Verapilide</td>
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<td>Rimonabant</td>
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<td>Carisoprodol</td>
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<tr>
<td>Acepromazine + Acepromazine</td>
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<tr>
<td>+Clorazepate</td>
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<td>Dextropropoxyphene</td>
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<td>Nefazodone</td>
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<td>Ximelagatran/melagatran</td>
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<td>Lumiracoxib</td>
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<td>Sitaxentan</td>
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</tbody>
</table>

*Other studies include non-randomised and/or not controlled clinical trials and incidence studies. EMA, European Medicines Agency; EU, European Union.

Case reports remain most significant method of pharmacovigilance
Impact of “landmark” safety issues

Shift from reactive to proactive – risk management plans to study known and potential risks for all new medicines

All data sources for critical evaluation – not only case reports

Scientific standards for safety studies – review of protocols by experts

Greater transparency on decisions -stakeholder involvement

Comprehensive revision of legislation in 2012
Current state of Pharmacovigilance

New approaches to use of evidence
Starting point: a “signal”

“Information that arises from one or multiple sources (including observations and experiments) which suggests a new potentially causal association, or a new aspect of a known association between an intervention and an event or set of related events, either adverse or beneficial which is judged to be of sufficient likelihood to justify verificatory action”

Hauben M, Aronson JK  Drug Safety 2009; 32(2) 99-110
MHRA signal detection

Traditional method was reviewing every new case report - but increasing volumes of ADRs make this impractical

Statistical methods to identify drug-ADR combinations disproportionately present in database i.e. observed is greater than expected

Mathematical scoring system aids prioritisation of signals detected from spontaneous ADR data
Strengthening signals from case reports

**Yellow Cards** are important tool but have limitations
- Differing levels of under-reporting and incomplete data
- Lack of exposure to put reports in context
- Can be too easy to dismiss confounded signals

**Electronic healthcare record data** is becoming increasing rich and available along with increased computing capabilities
- Already used to study drug utilisation, monitor patient outcomes, pharmacoepidemiological studies to evaluate signals

**Key Challenge:** To optimise the use of electronic healthcare record data to routinely support and strengthen wider pharmacovigilance providing robust data on risks and benefits as quickly as possible
Clinical Practice Research Datalink

Database of 30 years anonymised NHS records from UK GPs
> 22 million patients representative of gender, age & ethnicity

Routine linkage to secondary care (HES), mortality, cancer registry, deprivation datasets

Supporting public health research worldwide

• Drug safety
• Drug use
• Disease epidemiology
• Incidence/prevalence
• Care delivery

1700 peer-reviewed publications using CPRD data
Suspected cancer Clinical Guidance

Some NICE cancer guidance exclusively drew evidence from CPRD research

CPRD data is routinely used by MHRA in developing safety guidance

MMR vaccination and pervasive developmental disorders: a case-control study

Safety of pertussis vaccination in pregnant women in UK: observational study

Antidepressant treatment and the risk of fatal and non-fatal self harm in first episode depression: nested case-control study
Following longitudinal drug exposure

- Drug exposure over time and description of treated population
- Frequency of events in population
- Frequency of drug-event combination

Put signals into context
Combining ADR case reports & CPRD data

No increase in CFS observed vs expected rates using max sequential probability ratio testing

Donegan et al 2013, Vaccine 31, 43, 4961-7
Example: Observed vs expected analysis

Maximised SPRT for ME/Chronic Fatigue Syndrome for girls aged 12/13 years (2008-2009)

HPV vaccine - chronic fatigue syndrome
Continually evaluating benefit risk

Critical appraisal of all available evidence taking into account strength of evidence for causality, therapeutic context, treatment alternatives

In-house pharmacoepidemiology capability
Drug utilisation studies
Risk evaluation and quantification
Methodology development

Work with academia & clinical experts
Real world data in pharmacovigilance

Registries (prospective cohorts)
- Eg assess safety profile, health outcomes in clinical use, consider existing infrastructure consider comparator

Database studies
- Eg risk characterisation, investigation of targeted AEs

Drug utilisation studies
- Eg to assess effectiveness of risk minimisation measures or help plan PAS

Pharmacogenomics
- Eg genome-wide association studies
<table>
<thead>
<tr>
<th>Pharmacovigilance activity</th>
<th>Example of current issue in pharmacovigilance</th>
<th>Evidence sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal detection and investigation</td>
<td><strong>SGLT2 inhibitors</strong> and diabetic ketoacidosis</td>
<td>ADR reports, mechanistic data</td>
</tr>
<tr>
<td>Risk quantification, characterisation</td>
<td><strong>Fluoroquinolones</strong> - long-term persistent adverse drug reactions</td>
<td>ADR reports, observational data</td>
</tr>
<tr>
<td>Benefit risk evaluation</td>
<td><strong>Gadolinium contrast agents</strong> - tissue accumulation including brain</td>
<td>Pre-clinical data, PK studies, MRI</td>
</tr>
<tr>
<td>Risk management</td>
<td><strong>6-mercaptopurine</strong> - risk of severe leukopenia and alopecia</td>
<td>Pharmaco-genomic data NUDT15 gene</td>
</tr>
<tr>
<td>Effectiveness of risk minimisation</td>
<td><strong>Sodium valproate</strong> in pregnancy - neurodevelopmental disorders</td>
<td>Drug utilisation, patient views</td>
</tr>
</tbody>
</table>
Signal - SGLT2 inhibitors & diabetic ketoacidosis

Case reports of diabetic ketoacidosis associated with SGLT2 inhibitors in Type II diabetes

Prompt communication to HCPs in view of particular characteristic of signal – eugycaemia – related to mechanism of action of SGLT2s

Product information for HCPs and patients updated to include serious and occasionally fatal outcome
Risk characterisation - fluoroquinolones

FDA Drug Safety Communication: FDA advises restricting fluoroquinolone antibiotic use for certain uncomplicated infections; warns about disabling side effects that can occur together

According to a July 26 FDA Drug Safety Communication (www.fda.gov), these medications have been associated with disabling and potentially permanent side effects involving tendons, muscles and/or joints, as well as peripheral nerves and the central nervous system. Some patients may even experience more than one such adverse effect.
Benefit risk evaluation - Gadolinium contrast agents and tissue accumulation

Regulatory action in 2007 on nephrogenic systemic fibrosis

Growing evidence of brain deposition - publications

Risk appears greater with linear than macrocyclic agents

No evidence of harmful outcome to date
Risk management – 6-mercaptopurine

Mutations in NUDT15 gene result in increased thiopurine-related toxicity - leukopenia, alopecia

Ethnic variability in frequency of NUDT15.415 C>T
- ~ 10 % in E Asians
- 4 % in Hispanics
- 0.2 % in Europeans
- 0 % in Africans

Consider dose reduction in patients positive for NUDT15R139 C variant?

Moriyama et al 2016
Nature Genetics
Risk minimisation effectiveness - valproate

Developmental disorders up to 30 - 40% of pre-school children exposed in utero
- Delayed walking & talking, memory problems, difficulty with speech & language, lower intellectual ability

Increased risk autistic spectrum disorder (3X) and autism (5X gen pop)

More likely develop symptoms of ADHD

In addition to 11% risk of birth defects
Supporting the safe use of sodium valproate

Aims/objectives:
- That sodium valproate is only provided to women who may become pregnant when there is no safe and effective alternative
- That all women who need valproate fully understand the risks associated with pregnancy

Prescribing by GPs *

Target - To reduce use in women aged 14-45 by ~80%

In July—December 2015 for every 10,000 women aged 14-45* at least:
- 15 were prescribed sodium valproate and had epilepsy
- 4 were prescribed valproate and had bipolar disorder
- 4 were prescribed valproate and had migraines

5/10,000 pregnancies
Rate of exposure to sodium valproate in pregnancy in 2015 *

Patient awareness †

Of 620 epileptic women aged 16-50 currently taking valproate...
80% are aware of any effects on development and/or physical health of a child born to a woman taking sodium valproate

Have ever discussed pregnancy and sodium valproate with a...
Have received the following information...

- Pharmacy card
- Patient booklet
- Verbal checklist

† Data from a survey conducted by Epilepsy Society, Epilepsy Action, and Young Epilepsy

Data from the UK Clinical Practice Research Datalink (www.cprd.com)
Challenges & opportunities for pharmacovigilance
Challenges for pharmacovigilance

Biological medicines

Earlier access to new medicines and vaccines

Health professional engagement in detecting and managing risk

Greater patient involvement
Evolution of biological agents: how established drugs can become less safe

Changes to the manufacturing of biological agents can lead to drugs with different components from the original medicine tested in clinical trials, challenging assumptions about safety, say David Hunt and colleagues.

Nicole Casadevall professor of haematology¹, Oliver Flossmann consultant nephrologist², David Hunt honorary consultant neurologist and Wellcome Trust intermediate clinical fellow³
Suspect Reaction

<table>
<thead>
<tr>
<th>Suspect Reactions Added</th>
<th>Outcome of the Reaction</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrombotic microangiopathy</td>
<td>recovered/resolved with sequelae</td>
<td>11/2012</td>
<td>01/2013</td>
</tr>
</tbody>
</table>

Do you consider the reaction to be serious?
Yes

Reaction severity
Life threatening, Involved or prolonged inpatient hospitalisation, Involved persistent or significant disability or incapacity,

Suspect Drug

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Brand</th>
<th>Batch No.</th>
<th>Start Date</th>
<th>End Date</th>
<th>Dosage</th>
<th>Indication</th>
<th>Action taken for reaction</th>
<th>Method</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>rebif</td>
<td>rebif</td>
<td>-</td>
<td>2005</td>
<td>27/12/2012</td>
<td>44mcg 3xwk</td>
<td>Multiple sclerosis</td>
<td>Drug withdrawn</td>
<td>Subcutaneous</td>
<td>Prescription</td>
</tr>
</tbody>
</table>

Additional information
Reaction Description: patient increasingly unwell since end of October 2012 diagnosed with hypertension and acute renal failure requiring hospital admission on the 12/12/2012 found to be thrombocytopenic clinical picture obscured due to concomitant UTI (E coli) and chest infection kidney biopsy 11/01/2013 showed thrombotic microangiopathy patient became dialysis dependent 31/12/2012 haematological abnormalities normalised by but patient remained dialysis dependent ongoing concerns regarding poor nutrition; patient declined PEG feeding patient died of septic cardiogenic shock 13/4/2013; no ongoing active microangiopathy but end-stage renal failure contributed to death The patient was taking rebif for: Multiple sclerosis.
Thrombotic microangiopathy & Interferon β

Unexpectedly high number of cases of TMA in MS patients in south Scotland

Common features in renal biopsies

Initial hypothesis was association with common manufacturing source of Interferon β

Hunt D et al NEJM March 27, 2014
Interferon-TMA

Drug-mediated TMA (toxic dose-related reaction)

Hereditary complement-mediated TMA
Acquired complement-mediated TMA

Hereditary TTP
Acquired TTP

Coagulation-mediated TMA

Drug-mediated TMA (immune reaction)

Metabolism-mediated TMA (cobalamin deficiency)

Shiga toxin-mediated TMA (ST-HUS)
Further investigation in animal studies

Transgenic overexpression of type I interferon proteins such as IFN alpha & beta shows high levels of interferon cause dose-dependent small vessel damage, including changes seen in patients with TMA.

Consistent with a direct effect of interferon protein on small blood vessels

Kavanagh et al Blood 2016
Clinical observation
• Association of interferon with TMA was suspected from reports of individual patients

Clinical data suggesting a causal association of interferon with TMA
• Frequency of patients identified by a national registry
• Determination of dose-dependent toxicity

Laboratory confirmation of a causal association of interferon with TMA
• Documentation of Type I interferon as the cause of TMA in transgenic mice

Research data applied to clinical practice
• A practice guideline was established to monitor patients treated with Type I interferon
• Identification of early signs of TMA has allowed discontinuation of interferon before irreversible acute kidney injury occurs
Access to innovative medicines

Support for access to new medicines in areas of high unmet medical need

Adaptive licensing pathways under investigation

Aim to reduce uncertainties in benefit risk evaluation via robust risk management plan
Pembrolizumab risk management plan

Safety Specification

Pharmacovigilance Plan
- Info collected on all patients before receiving treatment
- Active follow-up for ADRs
- Reporting to MHRA

Risk minimisation measures
- Patient alert card
Understanding patients’ risk tolerance

Maximum Acceptable PML Risk
Crohn’s Disease

Therapeutic Benefits

- Mild to Remission
- Moderate to Remission
- Severe to Remission

- Physicians
- Parents
- Patients

Johnson et al 2010 J Manag Care Pharm
Involving healthcare professionals, patients & public in decisions

Interaction with patient and health professional organisations so far only during formal European drug safety reviews

Opportunity of public hearings to be introduced later in 2017
Health professional & patient awareness

Around 15% healthcare professionals have not heard of Yellow Card scheme

Majority of healthcare professionals have never reported a suspected adverse drug reaction

Patient and public awareness of Yellow Card – around 10%
Encouraging a learning culture by reporting errors

22. When something goes wrong with patient care, it is crucial that it is reported at an early stage so that lessons can be learnt quickly and patients can be protected from harm in the future.

23. Healthcare organisations should have a policy for reporting adverse incidents and near misses, and you must follow your organisation’s policy.²⁸

24. A number of reporting systems and schemes exist around the UK for reporting adverse incidents and near misses.

   a. Adverse and patient safety incidents in England and Wales are reported to the National Reporting and Learning System.²⁹

   b. You must report suspected adverse drug reactions to the UK-wide Yellow Card Scheme run by the Medicines and Healthcare products Regulatory Agency (MHRA) and the Commission on Human Medicines.³⁰

   c. You must report adverse incidents involving medical devices to the UK-wide MHRA reporting system.³¹
# Medical Appraisal Guide (MAG)

## Model Appraisal Form

**Version 4.2** (updated 2016)

<table>
<thead>
<tr>
<th>1</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Instructions for using this form</td>
</tr>
<tr>
<td>3</td>
<td>Personal details</td>
</tr>
<tr>
<td>4</td>
<td><strong>Scope of work</strong></td>
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<tr>
<td>5</td>
<td>Record of annual appraisals</td>
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<tr>
<td>6</td>
<td>Personal development plans and their review</td>
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<td>7</td>
<td>Continuing professional development (CPD)</td>
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<td>Quality improvement activity</td>
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<td><strong>Significant events</strong></td>
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</tr>
<tr>
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**Welcome!**

Please click on 'Instructions for using this form' and use the helptext bubbles throughout for guidance on how to enter the information required for your appraisal into this form.

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**Preparation for Appraisal**
Accredited pharmacovigilance e-learning

Introduction and learning objectives

Evidence review part 1: background to national ADR reporting systems

Evidence review part 2: reporting an ADR

Case scenarios

Assessment

Summary

Selecting each topic in turn from the menu will enable you to move directly to that section.

Note that you must complete one topic before moving on to the next.
Opportunities for pharmacovigilance

Digital & mobile transformation of pharmacovigilance – integrating risk management into clinician’s daily life

Integration of pharmacovigilance data capture into healthcare systems

Using common approaches with other healthcare surveillance systems – defects, counterfeit, blood incidents medical devices incidents
Digital pharmacovigilance transformation

Yellow Card mobile app to report ADRs

Receive drug safety news

✓ General
✓ Personalised

View ADR profiles of drugs of interest
Access interactive PV information

MHRA Drug Analysis Information

LEVORNESTREL (Single constituent brand names: ELEVIN, Femrice Coated Tablets [not otherwise coded], Femrice Coated Tablets 150/30, Levette Coated Tablets 150/30 [not otherwise coded], Femrice Tablets [not otherwise coded], LEWELLE, LEWELLE-2, LEVORNESTREL [not otherwise coded], MICROVAL, MIRENA, NORGESTON, NORPLANT, PRIMECROWN POSTINOR, UVESTELLE)
(Multiple constituent brand names: CYCLOPROGYNova, EUGYNON, FEMSEVEN CONTO, FEMSEVEN SEQUIL, LEVEST, LOGYNON, LOGYNON ED, MICROGYNON, MICROGYNON ED, NUVELLE, OVRAN, OVRA 30, OVRA POST-CORTAL, OVRANEETTE, RIGEVIDON, TRINORDIOL)
Total number of reactions: 14386 Total number of ADR reports: 7811 Total number of fatal ADR reports: 160
Displays show breakdown of all 7811 UK spontaneous reports received for LEVORNESTREL

Reports by Gender

Reset to Include All Reports

Gender:
☐ Male ☐ Female ☐ Unknown

Age Group:
Youngest Age Group:
0-4
OJlest Age Group:
100+
☐ Unknown Age Group

Year Received:
Earliest Year Received:
1988
Latest Year Received:
2015

Reporter:
☐ Patient/Carer ☐ Healthcare Professional

Report Submission:
☐ Direct to Agency ☐ Indirect via Industry

Route of Administration:
☐ (Select All)
☐ INTRAUTERINE USE ☐ ORAL USE
☐ SUBCUTANEOUS USE ☐ VAGINAL USE
☐ UNKNOWN ☐ Routes with few reports

Reports by Age Group
What’s to come – using social media?

Will social media data supplement evidence from Yellow Card reports?
Summary

Safety profile of a new medicine only fully characterised in clinical use in wider population

Pharmacovigilance has evolved in response to drug safety issues to become proactive, planning risk management and evaluating effectiveness of risk minimisation measures

Opportunities include maximising use of new technologies & evidence sources, synergies with other surveillance systems

MHRA’s overall goal is vigilance systems which work for all medicines users – to minimise risk and maximise benefits