SPS Medication Safety Update
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Recent critical patient safety alerts, reports, and publications

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Patient Safety Alerts

- **DHSC**
- COVID-19 Therapeutic Alert (CEM/CMO/2023/001)
  - Publication of NICE Multiple Technology Appraisal (MTA) - Treatment Recommendations for COVID-19

Specialist Pharmacy Service MHRA NHS England

Recent regulator and statutory body activity

- Class 4 Medicines Defect Information: Ethigen Limited, Briviact 75mg & 100mg film-coated tablets, EL(23)A/13
  - Patient Information Leaflet (PIL) in Briviact 75mg and Briviact 100mg film coated tablets contains incorrect or missing information.
- Class 4 Medicines Defect Information: Sandoz Limited, Co-amoxiclav 125/31.25mg/5ml, 250/62.5mg/5ml powder for oral suspension, EL (23)A/14
  - Sandoz limited has informed the MHRA that the products mentioned in this notification are not sugar free despite the carton stating 'sugar free'. The 'sugar free' text was added to the carton in December 2008 in error.
- Company led medicines recall: Spectrum Therapeutics UK, Canopy AKH 22 Dried Cannabis 5g [unlicensed medicine], CLMR (23)A/04
  - The importer and distributor of the above products has informed us of reports that the microbial limit for Total Microbial Aerobic Count (TAMC) has been tested to exceed the predefined limit of 200 CfU/g as per the product specification fixed according to Pharm. Eur. Monograph 5.1.4 (inhalation use).
- Belzer UW Cold Storage Solution and Belzer MPS UW Machine Perfusion Solution manufactured by Carnamedica (UKRP: Bridge to Life): Contamination of fluid (update to DSI/2023/002), DSI/2023/005
  - Replaces advice in DSI/2023/002, which should no longer be followed. Details an updated list of LOTs associated with defect reports, additional problems identified with the solution, and new actions for healthcare professionals.

Recent regulator and statutory body activity

- Drug Safety Update – April issue published after slides finalised

Direct HCP communication

- **Direct to Healthcare professionals letters (sent Feb 2023)**
  - Mylotarg (gemtuzumab ozogamicin) 5mg powder for concentrate for solution for infusion: interim supply from US
  - Onasemnogene abeparvovec (Zolgensma▼): fatal cases of acute liver failure
  - ONIVYDE pegylated liposomal 4.3 mg/ml concentrate for dispersion for infusion Interim Supply of Irish packs (common pack for Republic of Ireland and Northern Ireland) to Mitigate Supply Disruption
  - ADAKVEO ▼ (crizanlizumab): Phase III study (CSEG101A2301) shows no superiority of crizanlizumab over placebo

Pharmacovigilance Risk Assessment Committee (PRAC)

- Meeting 11-14th April 2023
  - The Committee did not start or conclude any referral procedures.
  - Ongoing Referrals
    - Topiramate – use in pregnancy and women of childbearing potential
    - Pseudoephedrine – safety review of pseudoephedrine containing medicines

SPC changes or Manufacturer RMM

- Revised SPC: Stivarga (regorafenib) 40 mg film-coated tablets
    - Warnings on risk of thrombotic microangiopathy (TMA), including thrombotic thrombocytopaenic purpura, which has been reported with use of regorafenib. In patients who develop TMA, SPC advises to discontinue regorafenib and seek prompt treatment.
- Revised SPC: Mezavant (mesalazine) XL 1200mg, gastro-resistant, prolonged release tablets
    - Potential to cause red-brown urine discoloration after contact with sodium hypochlorite bleach (e.g. in toilets cleaned with sodium hypochlorite contained in certain bleaches).
- Revised SPC: Venlafaxine XL 150 mg prolonged-release tablets (Dexcel Pharma)
    - Patients should be advised not to use alcohol, considering its CNS effects and potential of clinical worsening of psychiatric conditions, and potential for adverse interactions with venlafaxine. Overdose with venlafaxine has been reported predominantly with alcohol.
- Revised SPC: Orkambi 100 mg/125 mg and 150 mg/188 mg (lumacaftor/ ivacaftor) granules in sachet
    - New table for patients on strong CYP3A inhibitors; revised table to include data on both moderate & severe hepatic impairment; revised method of administration to include more examples of foods & liquids, & info on sweat chloride added to pharmacodynamics section.

SPC changes or Manufacturer RMM

- Revised SPC: Omeprazole preparations
  - Acute tubulointerstitial nephritis has been added as a rare potential adverse effect. It may occur at any point during therapy and can progress to renal failure. Omeprazole should be discontinued in case of suspected cases, and appropriate treatment promptly initiated.
- Revised SPC: Dysport (Clostridium botulinum type A toxin-haemagglutinin complex) 500 units Powder for solution for injection
  - Addition of pictograms showing the injection sites into the muscles.
- Revised SPC: Vaborem 1g/1g (meropenem, and vaborbactam) infusion
  - Risk of interaction when administering Vaborem concomitantly with drugs metabolised by CYP1A2, CYP3A4, CYP2C and transported by P-gp which may result in decreased plasma concentrations of the co-administered drug.
- Revised SPC: Piqray (alpelisib) tablets
  - Colitis and angioedema have been added as potential adverse effects of treatment (frequency unknown for both).
- Revised SPC: Revlimid (lenalidomide) Hard Capsules (all strengths)
  - Dose for patients with severe renal impairment/end stage renal disease for follicular lymphoma indication updated based on additional pharmacokinetic analysis, as has existing warning highlighting men should not donate semen/sperm during treatment & for ≥7 days afterwards.

SPC changes or Manufacturer RMM

- Revised SPC: Dexamfetamine Sulfate 1 mg/ ml Oral Solution
  - Dexamfetamine is in part metabolised via CYP2D6. Although the clinical significance of this interaction is likely to be minimal, attention should be paid when medications metabolised by these pathways are administered.
- Revised SPC: Lipitor (atorvastatin) 80 mg film-coated tablets
  - In a few cases, statins have been reported to induce de novo or aggravate pre-existing myasthenia gravis or ocular myasthenia, and that treatment should be discontinued in case of aggravation of symptoms.
- Revised SPC: Amorolfine nail lacquer preparations
  - The product contains 55.2% ethanol, and it includes warnings with respect to being a flammable substance that should not be used near an open flame, a lit cigarette or some devices (e.g. hair dryers).
- Revised SPC: Spikevax bivalent (elasomeran, imelasomeran)
  - Chemical and physical stability has also been demonstrated for unopened vaccine vials for 12 months (previously 9 months) when stored at -50°C to -15°C and now notes preferred site of intramuscular administration is the deltoid muscle of the upper arm.
- Revised SPC: Covid-19 Vaccine Janssen
  - Sections 4.8 and 5.1 have been updated to include safety and immunogenicity data following a booster (second dose).

SPC changes or Manufacturer RMM

- Educational Risk Minimisation Materials to help reduce the risk associated with using Ximluci (ranibizumab) 10 mg/mL solution for injection
  - Materials include patient audio guide & booklet covering how Ximluci works & is administered, as well as safety information, when used to treat neovascular(wet) AMD, choroidal neovascularisation, proliferative diabetic retinopathy, diabetic macular oedema & retinal vein occlusion

Drug shortages and discontinuations

Recent medicine shortages and discontinuations are available via: the SPS Medicines Supply Tool (registration required to access)

Discontinuations highlighted by SPS supply tool in last month

- Lanoxin PG (digoxin) 50micrograms/ml elixir
- Abelcet 100mg/20mg concentrate for suspension for infusion vials
- Venlafaxine (Venlalic) XL 37.5mg tablets

- This is not a comprehensive list.

Drug shortages and discontinuations

Recent medicine shortages and discontinuations are available via: the SPS Medicines Supply Tool (registration required to access)

New Shortages highlighted by SPS supply tool where the MSN states MSO action required

- Lidocaine 40mg/2ml (2%) solution for injection ampoules(MSN/2023/029*)
- Octreotide 50micrograms/1ml solution for injection vials (MSN/2023/040*)
- Streptokinase 250,000unit powder for solution for infusion vials (MSN/2023/038*)
- Ketamine (Ketalar) 10mg/ml solution for injection vial (Schedule 2 controlled drug) (MSN/2023/043*)
- [Oxycodone 5mg/5ml oral solution (MSN/2023/042), no MSO action but likely high impact]

This is not a comprehensive list. Only critical safety medication shortages, where MSO action required, have been highlighted.

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- Using angiotensin-converting enzyme (ACE) inhibitors during breastfeeding
  - Enalapril is the ACE inhibitor of choice during breastfeeding. Recommendations apply to full term and healthy infants only.
- Using lipid-lowering medicines during breastfeeding
  - Rosuvastatin, pravastatin and atorvastatin are preferred; simvastatin and ezetimibe can also be used. Recommendations apply to full term and healthy infants.
- Using bisphosphonates with proton pump inhibitors (PPIs)
  - Although no interaction between bisphosphonates and PPIs is documented, the increased risk of fractures when given together should be reviewed and managed.
- Poisoning and toxicity: resources to support answering questions
  - Resources for primary care healthcare professionals to find information to answer questions about medicine toxicity or overdose.
- Identifying risk factors for developing a long QT interval
  - Some medicines (erythromycin, citalopram, ondansetron) can cause a long QT interval. Consider risk factors and follow MHRA recommendations for safe use.

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- Understanding the characteristics of Comirnaty 10 Concentrate (for children 5-11 years) vaccine
  - Update: Shelf life and storage - added maximum shelf life post dilution of 6 hours for microbiological reasons. Allergies, excipients and dietary advice moved to this page.
- Understanding the characteristics of Comirnaty Original / Omicron BA.4-5 vaccine
  - An overview of the Comirnaty Original / Omicron BA4. 4-5 vaccine and signposts to other useful resources. NB: Allergies, excipients and dietary advice now moved into this article.
- Preparing Comirnaty Original / Omicron BA.4-5
  - An example SOP for preparing Comirnaty Original / Omicron BA.4-5 vaccine.
- Preparing Comirnaty 10 Concentrate vaccine
  - Update: Change to SOP to state vial should not be used for longer than 6 hours post puncture for microbial reason.
- Understanding the characteristics of VidPrevtyn Beta
  - An overview of the VidPrevtyn Beta vaccine and signposts to other useful resources. NB: Allergies, excipients and dietary advice now moved into this article.
- Preparing VidPrevtyn Beta vaccine
  - An example SOP for the preparation of VidPrevtyn Beta vaccine.
- Managing COVID-19 Vaccines: Guidance and SOPs
  - Update: inclusion of vaccines used in spring 2023 campaign.

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- Ordering, receiving and storing COVID-19 vaccines
  - Update: SOP and page updated to remove reference to frozen storage / thawing of vaccines as this is no longer routine practice
- Transporting COVID-19 vaccines
  - Update: SOP HCV 6 updated to reflect vaccines used in spring 2023 campaign.
- Interactions information for COVID-19 vaccines
  - Update: Updated to reflect co-administration with other vaccines advice in green book.
- Safe and secure handling, spillage and disposal of COVID-19 vaccines
  - Update: Attachment SOP HCV 7 updated following launch of VidPrevtyn Beta. Now states defaced cartons may be disposed of via general waste stream.
- The legal mechanisms available for giving COVID-19 vaccines and their application
  - Update: Minor formatting amendments to reflect changes to a single NP and single PGD for spring campaign.
- Amendments to the expiry date on cartons of COVID-19 vaccines
  - Update: Nuvaxovid and Comirnaty Original/Omicron BA.4-5 expiry extensions added.

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- Pharmacy responsibilities for management of stocks of oxygen and other medical gases
    - Update: NHS Protect guidance on security and storage of medical gas cylinders added.
- Patient Group Direction use in virtual ward services
    - Considerations required before implementing Patient Group Direction (PGDs) for in virtual ward services.
- Patient Group Direction use by temporary professional registrants
    - Update: Minor updates to text to reflect changes in temporary registers in response to their extension.
- Retaining legal mechanism documentation
    - Update: PSD record keeping information added.
- SPS Spotlight Monthly Digest
    - March slide deck summarising new and existing materials from across SPS, and signposting to upcoming events and activities. Please distributed to relevant healthcare professionals and their teams.
- New Medicines News
    - March highlights of recent new product launches and significant medicines regulatory changes.
- Medication Safety Update
    - Update: March - latest medication safety communications and publications to inform, support and inspire medication safety improvements.

Specialist Pharmacy Service

- The following Intrathecal medicines pages have updated links:
  - Baclofen products: information for supporting intrathecal risk assessment
  - Colistimethate Sodium products: information for supporting intrathecal risk assessment
  - Cytarabine products: information for supporting intrathecal risk assessment
  - Levobupivacaine products: information for supporting intrathecal risk assessment
  - Omnipaque products: information for supporting intrathecal risk assessment
  - Trastuzumab products: information for supporting intrathecal risk assessment

National guidance, publications and resources

- **UKHSA**
- [All influenza vaccines marketed in the UK for the 2023 to 2024 season]
  - The table lists all of the vaccines that are marketed in the UK for the 2023 to 2024 flu vaccination season, including ovalbumin content. (Information on use of influenza vaccines in egg allergic individuals can be found in the green book (Chapter 19)).
- [COVID-19 vaccination: spring 2023 booster resources]
  - Patient information on the spring 2023 booster dose for eligible individuals.
- **British Menopause Society**
- [Joint BMS FSRH RCGP RCOG SfE and RCN Women's Health Forum safety alert]
  - Joint safety alert from 6 leading UK health bodies has been published in response to concerns about requests from private clinics to prescribe high doses of oestrogen, outside of product licence & sometimes with insufficient progestogen, for women experiencing menopause symptoms.
- **SIGN**
- [National clinical guideline for stroke for the UK and Ireland]
  - This partial update of 2016 edition, developed in collaboration with SIGN & National Clinical Programme for Stroke, Ireland, is endorsed for use in clinical practice by RCP (London), SIGN & RCP (Ireland). Of 538 recommendations, almost 300 have been updated, added or endorsed.
- [Pharmacological management of migraine - updated SIGN guideline]
  - Following a scoping review, this guideline has been updated to include revised safety advice on use of topiramate, candesartan, flunarizine and CGRP monoclonal antibodies, SMC advice on eptinezumab, and recommended use of sodium valproate restricted to patients > 55 years.

National guidance, publications and resources

- **NHSE**

- Community pharmacy oral anticoagulant safety audit 2021/22
  - Findings show there is still significant scope to improve the safety of patients who require anticoagulation, with no improvement in patient knowledge since 2017/18 audit. Although pharmacy teams can play a key role, wider discussion is required about the role of the wider MDT.

- Community Pharmacy Quality Scheme: 2019/20 high risk medicines audit report – Lithium, methotrexate, amiodarone and phenobarbital
  - A total of 40,419 patients were audited as part of this PQS scheme by 10,673 pharmacy contractors. Some patients were identified who were not routinely receiving appropriate monitoring for high-risk medicines. Systems should be improved to ensure monitoring is in place for all patients taking these high-risk medicines.

- NHS delivery and continuous improvement review: findings and recommendations
  - Actions from review conducted by Anne Eden are to establish a national improvement board, launch a single, shared 'NHS improvement approach', and co-design and establish a Leadership for Improvement programme.

- **NHS Digital**

- Medicines and Pregnancy Registry - Antiepileptic use in females aged 0 to 54 in England: April 2018 to September 2022
  - An analysis of valproate prescribing in female patients aged up to 55 between April 2018 and September 2022 shows a reduction of over 9,092 in that timeframe (18,349 vs 27,441). Of the women taking valproate in September 2022, over 50% were under 45 years old.

- **NICE**

- Genedrive MT-RNR1 ID Kit for detecting a genetic variant to guide antibiotic use and prevent hearing loss in babies: early value assessment
  - NICE recommends that this can be used while further evidence is generated as an option for detecting the genetic variant m.1555A>G to guide antibiotic (aminoglycoside) use and prevent hearing loss in newborns who are being considered for treatment with aminoglycosides.

National guidance, publications and resources

- **HSIB**
- Safety risk of air embolus associated with central venous catheters used for haemodialysis treatment
  - This report explores factors that affect the ability of staff to safely access haemodialysis catheters, its findings, safety observations, and three resultant recommendations to the General Medical Council and MHRA.
- Failing to communicate: challenges with electronic communication systems
  - Article notes that electronic administrative systems have been chosen to meet organisational needs and the requirement for connectivity with other organisations may not have been predicted at the time of purchase. It discusses potential patient safety problems with this issue.
- **NIHR Alert**
- Combination therapy for painful diabetic neuropathy is safe and effective
  - Commentaries provided on RCT comparing pregabalin, amitriptyline, & duloxetine showing combinations of these drugs are safe, and equally effective at relieving pain, so clinicians can be reassured patients can be started on any one of the 3 and have another added, if needed.
- Antipsychotics are increasingly prescribed to children and teenagers
  - Expert commentaries on findings that 0.3% of children and young people in England were prescribed antipsychotics in primary care at least once between 2000 and 2019, with rates doubling during this period, raise concerns due to lack of safety and efficacy data for this age group.
- **DHSC**
- Government announces national 'swap to stop' scheme designed to encourage one million smokers to swap cigarettes for vapes to reduce smoking rates
  - One in 5 of all smokers in England will be provided with a vape starter kit alongside behavioural support as part of a series of new measures to help the government ambition to be smoke-free by 2030. Pregnant women will also be offered financial incentives to help them quit.

National guidance, publications and resources

- **King's Fund**
- The rise and decline of the NHS in England 2000–20: How political failure led to the crisis in the NHS and social care
    - Report notes NHS has just come through its most difficult winter in living memory. Rather than attributing current situation to some inevitable built-in decay, it draws out the decisions (or lack of them) that have led to the current crisis.
- Pharmacist prescribing – professional revolution or damp squib?
    - From 2026, pharmacy graduates registered with GPhC will automatically become prescribers. In guest blog, former CPO for England fears yet another innovation to help transform patient care could just fall over cliff edge into world of piecemeal & largely unplanned utilisation.
- **Pharmaceutical Services Negotiating Committee**
- Summary Care Record (SCR) to be replaced by National Care Records Service (NCRS)
    - In September 2023, the SCR will be replaced by the NCRS, which enables view of SCR information but additionally view of Personal Demographics Service, National Record Locator, and Reasonable Adjustments Flag; locally held care plans can also be included.

National guidance, publications and resources

- **Pharmaceutical Journal**

- Pharmacy audit finds one in three patients taking lithium unaware of toxicity warning signs
  - In an audit of 40,419 patients under the Pharmacy Quality Scheme, 34% were unable to describe the signs of lithium toxicity. Additional counselling was provided by the pharmacy 23,957 times during the audit, where answers to the audit questions suggested this was required.

- Government warned repeatedly to better regulate supply of drugs online after series of deaths
  - An analysis of coroner's reports by the Pharmaceutical Journal has revealed concerns about the regulation of supply of dugs online have been raised in 20 reports since 2013; including for example that many dangerous drugs are "freely marketed" with "no regulation" in supply.

- Audit finds fewer than one in ten patients carry anticoagulation safety card
  - Latest community pharmacy (CP) oral anticoagulant safety audit, which took place Sept 2021 to Mar 2022, with data from 131,526 patients attending 9,303 pharmacies, found just 8% prescribed an anticoagulant were carrying their yellow anticoagulant card when visiting CP.

- Third of women taking anti-seizure medication unaware of pregnancy risks, survey reveals
  - A survey by Epilepsy Action found that 33% of women and girls taking carbamazepine, phenobarbital, phenytoin, pregabalin or topiramate were unaware of the increased risk of physical birth abnormalities if taken in pregnancy. However, awareness of risks of valproate had improved.

National guidance, publications and resources

- [Prenatal Exposure to Antiseizure Medication and Incidence of Childhood- and Adolescence-Onset Psychiatric Disorders]

  Cohort study (n=38,661 children) found prenatal exposure to valproate was associated with an increased risk of psychiatric disorders (aHR 1.80; 95% CI 1.60-2.03). Associations were also found for topiramate with ADHD (2.38; 1.40-4.06) and levetiracetam with anxiety and ADHD.

  JAMA Neurology

- [Antiseizure Medication Use During Pregnancy and Neonatal Growth Outcomes: A Systematic Review and Meta-Analysis]

  Review (65 studies) found pregnant people exposed to these drugs had increased risk of small for gestational age (RR 1.33, 95% CI 1.18-1.50, I2 74%) and low birth weight (RR 1.54, 95% CI 1.33 to 1.77, I2 67%) babies. Polytherapy was linked to higher risks compared to monotherapy.

  British Journal of Clinical Pharmacology

Prevention of Future Death Reports (Regulation 28)

Courts and Tribunals Judiciary

Ref: 2023-0107

- Propranolol prescribed for anxiety by a locum GP 6 months previously, recently changed to sertraline. An overdose of remaining propranolol was taken as an impulsive act, after which help was sought, the provision of which was delayed. Individual rang the Crisis Team and NHS 111 within 30 minutes of taking the overdose. Two opportunities were missed to send an ambulance sooner which may have meant her reaching hospital at least two hours earlier than she eventually did.

Cause of death

- Intentional Propranolol Overdose
- Anxiety & Mood Disorder

Concerns

- No advice given to safely dispose of propranolol which was no longer required/prescribed – propranolol is known to be cardiotoxic in overdose and the patient was known to be in a potentially fragile mental state (recent prescription of sertraline for depression/anxiety).

Prevention of Future Death Reports (Regulation 28)

Courts and
Tribunals Judiciary

Ref:2023-0106

- The individual inhaled the contents of a number of nitrous oxide cannisters. She started to wheeze and used her blue inhaler. She declined an ambulance and collapsed as she was going outside to get air. An ambulance was called and her friend performed CPR. She was resuscitated but died the next day.

Cause of death

- Inhalation of Nitrous Oxide compounding Asthma

Concerns

- The present legal framework concerning Nitrous Oxide should be reviewed, in the light of this death, having regard to the seemingly increasing use of Nitrous Oxide particularly by young persons.

Primary research- Medication Safety

- Frequency of nursing student medication errors: A systematic review.
  - The frequency of nursing student medication errors is high. The safe administration of medications is an important skill that nursing students should learn. At a theoretical and practical/clinical level, it would be advisable for clinical nurses and academics to jointly develop an educational program to acquire correct knowledge and perceptions regarding safe medication administration. (Greece)
  - medRxiv (In press)
- Is primary care a patient-safe setting? Prevalence, severity, nature, and causes of adverse events: numerous and mostly avoidable
  - Knowing the frequency and characteristics of adverse events is key to implementing actions that can prevent their occurrence. A high prevalence of adverse events (1 in 66 consultations) was observed, which was slightly higher than those reported in similar studies. About three out of four such events were considered to be avoidable and one out of 13 were severe. Prescription errors, drug administration errors by patients, and clinical assessment errors were the most frequent types of adverse events.
  - Int J Qual Health Care
- Medication errors in community pharmacies: Evaluation of a standardized safety program.
  - Using reports to the Canadian AIMS programme the authors found that most frequent event types involved the incorrect drug (19.5%), concentration (17.2%) or quantity (14.5%). Approximately 25% of events were identified by the involved patient or their agent. When looking at medication classes, antihypertensives, opioids and antidepressants were involved in over one-quarter of overall and higher severity events. Environmental staffing problems and interruptions were the contributory factor and sub-factor most frequently reported, respectively.
  - Exploratory Research in Clinical and Social Pharmacy
- The Value of Learning From Near Misses to Improve Patient Safety: A Scoping Review
  - 4,745 articles were identified. Health care assumes that reporting and learning from near misses improves patient safety. The literature provides limited evidence supporting these assumptions and shows that actions as a result of near misses are commonly aimed at the human
  - J Patient Safety

Primary research- Medication Safety

- Implementation status of safety measures to prevent errors with non-oncologic methotrexate: surveys in community and hospital pharmacies.
  - Accidental overdose of low-dose methotrexate can lead to serious patient harm. Safety in relation to methotrexate in pharmacies relies mostly on staff instructions, which are considered weak measures. In light of the serious risk imposed on patients, pharmacies should set a focus on stronger IT-based measures that rely less on human performance.
  - International Journal of Clinical Pharmac (in press)
- Analysis of the nature and contributory factors of medication safety incidents following hospital discharge using National Reporting and Learning System (NRLS) data from England and Wales: a multi-method study.
  - Medication incidents after hospital discharge are associated with patient harm. A total of 1121 medication-related incident reports underwent analysis. More than one in 10 incidents were associated with patient harm. The drug monitoring (17%) and administration stages (15%) were associated with a higher proportion of harmful incidents than any other drug use stages. The most common contributory factors were organisation factors (82%), followed by staff factors (16%).
  - Therapeutic Advances in Drug Safety. (in press)
- "Are we there yet?" Ten persistent hazards and inefficiencies with the use of medication administration technology from the perspective of practicing nurses
  - (1) Compatibility constraints (2) Missing action cues (3) Intermittent communication flow between safety monitoring systems and nurses (4) Occlusion of important alerts by other, less helpful alerts (5) Information required for tasks is not collocated; (6) Inconsistent data organization (7) Hidden medication administration technologies (MAT) limitations (8) Software rigidity causes workarounds (9) Cumbersome dependencies between technology and the physical environment (10) Technology breakdowns require adaptive actions.
  - J Am Med Inform Assoc
- Nursing Student Errors and Near Misses: Three Years of Data
  - Understanding the magnitude of errors and near misses in all health care situations is crucial to preventing them from occurring in the future. Medication errors represented more than half (58.8%) of the total error and near-miss data (n = 1,042) submitted. Errors and near misses were attributed to students not adhering to three major patient safety procedures: checking the patient's identification, checking the patient's allergy status, and following the rights of medication administration.
  - J Nurs Educ