Foreword

The Duty Room Update highlights two infectious diseases with important public health consequences: Norovirus and Carbapenemase Enterobacteriaceae (CPE). The Norovirus article has some practical information to assist in the management of Norovirus outbreaks. In the second article, the emergence of Carbapenemase Enterobacteriaceae (CPE) in recent years is described and the public health measures to control its spread are outlined.

It is the time of year for the annual flu vaccination programme. We have articles with details of the planned vaccination programme and flu surveillance information from previous years.

Infection with Group A streptococci (GAS) can result in a variety of clinical presentations and may in some instances result in very severe infection. Public Health Action to try to control the most severe form of the disease (iGAS) depends on close cooperation with clinicians and laboratories.

Finally, there is an article on Hepatitis B describing the epidemiology, clinical presentation and outlining the post-exposure management of contacts.

As always, we welcome your feedback on the contents of this issue.

Assistant Director of Public Health (Health Protection)
Duty Room Updates

This section of Transmit aims to bring current Public Health issues and events to the attention of our professional colleagues.

The Duty Room provides specialist health protection advice, guidance and operational support on all health protection matters.

The Duty Team will respond to all enquiries from health professionals and others, including nursing and residential homes, local councils, community health services (including schools and social services). The new contact details for the Duty Room are:

**Health Protection Duty Room**

Tel: 0300 555 0119  
Fax: 02895 363947  
Email: pha.dutyroom@hscni.net

Norovirus (Winter Vomiting Bug)

**Suspected Norovirus outbreaks should be reported to the Health Protection Duty Room in Linenhall Street on 0300 555 0119.** It is important that suspected outbreaks are reported as soon as possible. Health Protection staff will provide support and guidance on how to limit the impact of the outbreak.

**What is Norovirus?**
Norovirus (winter vomiting disease) is caused by a highly infectious virus that results in gastrointestinal symptoms of infection. The virus is easily transmitted from one person to another and outbreaks are commonly reported in connection to hospitals, nursing homes, cruise ships, restaurants and hotels.

**What symptoms do Norovirus cause?**
Symptoms include vomiting (usually projectile) and/or diarrhoea which may also be accompanied by a fever. The onset is usually sudden and lasts a few days. Most people who develop Norovirus infection recover within a short period of time.

**How is Norovirus transmitted?**
It is transmitted following contact with contaminated surfaces or a person infected with the virus. The virus can also be ingested if food or drinks are contaminated by someone recovering from infection.

**How is Norovirus infection diagnosed?**
Symptoms such as sudden onset of projectile vomiting and diarrhoea and recovery within a short period of time are good indicators of Norovirus infection. However, detection of the virus/viral components from a faeces sample is the only way to confirm diagnosis. Faeces samples will only be tested for Norovirus when requested by health protection staff or hospital infection prevention and control staff, as part of an outbreak investigation.
**How is a suspected outbreak reported?**
All nursing homes should report outbreaks of gastro-intestinal infections to the Health Protection Duty Room on 0300 555 00119. They will be provided with verbal advice on how to handle an outbreak and will also receive written guidelines.

**How will sample collection be arranged?**
Instructions on specimen collection for outbreaks in nursing homes and other community settings will be provided by the Health Protection Duty Room officer or on-call Public Health doctor. If a Norovirus outbreak is suspected, Health Protection staff will liaise with the staff in the virology laboratory and the nursing home to ensure that the appropriate samples are collected and tested. This will include submitting faeces samples of staff and residents that are symptomatic. During an outbreak the first six samples of either vomit or faeces that are collected will be tested to determine if the cause is Norovirus. In addition to this samples will be sent for microbiological testing (including the detection of *Clostridium difficile*), to eliminate other possible causes of an outbreak.

**Is there a vaccine available?**
There is no vaccine available to prevent Norovirus infection and it is possible to develop an infection caused by Norovirus more than once in one season. The virus is constantly changing and there are many different types of Norovirus. Infection by one type of Norovirus does not result in immunity from a different circulating type of the virus.

**If the symptoms are mild, why do we take precautions to prevent Norovirus infections?**
Outbreaks of Norovirus in the hospital often reflect outbreaks occurring in the community and they result in ward closures and disruption to service delivery. They may also delay transfers from acute services to nursing home settings.

**What infection control precautions do I need to take if I need to visit a patient with suspected Norovirus infection?**
Symptomatic residents in care homes should be cared for in their own room until they are 48 hours symptom-free. Gloves and aprons should be worn when providing direct care for these residents and hand should be used using the 7-step technique following removal of gloves and aprons. Gloves and aprons should be removed before leaving the resident’s room.

Ms A Quinn, Health Protection Nurse
Carbapenemase Producing Enterobacteriaceae

Over the last 5 years, the UK has seen a rapid increase in the incidence of infection and colonisation by multi-drug resistant Carbapenemase producing Enterobacteriaceae (CPEs). Since 2011, more than twenty cases of CPE infection have been identified in Northern Ireland, with seven cases already reported so far in 2014 (Figure 1).

**Figure 1: CPE confirmed isolates NI by resistant mechanism, 2011-2014**

<table>
<thead>
<tr>
<th>Year</th>
<th>Unknown</th>
<th>VIM</th>
<th>OXA-48</th>
<th>NDM</th>
<th>KPC</th>
</tr>
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<tbody>
<tr>
<td>2011</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>2012</td>
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<td>2013</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2014*</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Updated: 03/07/2014 – Data provisional, subject to change.

Graph produced by G Ross, L Patterson (PHA)

In many countries worldwide CPEs are already endemic. Unless action is taken now, spread of carbapenem-resistant bacteria will pose a significant threat to public health in the future. This article provides information on what these organisms are, why they are so concerning, and what can be done to reduce their spread.

**What are Enterobacteriaceae?**
The Enterobacteriaceae are a large family of bacteria, many of which live harmlessly in the gut of humans and animals. However, they are also among the most common causes of opportunistic urinary tract infections, intra-abdominal and bloodstream infections. Examples of bacteria in this family include *Escherichia coli*, *Klebsiella* spp and *Enterobacter* spp.

**What are Carbapenemase Producing Enterobacteriaceae (CPEs)?**
Carabapenemase producing Enterobacteriaceae (CPEs) are those which have acquired genes that enable them to produce carbapenemase, an enzyme which is able to destroy a group of antibiotics known as carbapenems. This makes the organism resistant to these antibiotics. Other names used for these organisms includes Carababenemase producing Organisms (CPOs) and Carbapenemase Resistant Enterbacteriaceae (CREs).

There are different types of carbapenemase enzymes, which are assigned to classes based on their resistance mechanisms. Some of the more commonly identified enzymes include *Klebsiella pneumoniae* carbapenemase (KPC) and New Delhi Metallo-beta-lactamase (NDM). Different types of resistances are associated with different geographical areas, and can give clues to where the infection may have been acquired.
Note that CPEs are different to Glycopeptide-resistant Enterococci (GREs), which refer to a different group of bacteria (Enterococci) which are resistant to a different family of antibiotics (glycopeptides) which includes vancomycin and teicoplanin.

**What are Carbapenem Antibiotics?**
Carbapenems are a group of powerful, broad spectrum antibiotics that belong to the beta-lactam (penicillin-related) family. Examples include meropenem, imipenem and ertapenem. Carbapenems are a valuable group of antibiotics, usually reserved as a last defence against multi-resistant bacterial infections that have failed to respond to other antibiotics. This makes it particularly concerning that we are beginning to see more organisms in Northern Ireland that are resistant to carbapenems.

There is a lack of alternative antibiotics to treat bacteria that display this type of resistance, so it is extremely important that health care staff and the public work together to minimise the spread of these organisms.

**What kinds of health problems do CPEs cause?**
The effects of CPEs are varied, ranging from asymptomatic carriage to life threatening sepsis. The seriousness of an infection with CPE depends on numerous factors, including the type of bacteria, the health status of the person infected, and what part of the body is affected. Common sites for infection include the urinary tract, blood, lungs, and wounds.

Colonisation with CPE occurs in the gastrointestinal tract and may not cause any symptoms, but has the potential to cause infection if the bacteria spread to other parts of the body, or to another person.

**Are some people more at risk than others?**
People at higher risk of CPEs include those who:

1. have a history of previous colonisation or infection with CPE;
2. have been admitted to a hospital abroad in the last 12 months;
3. have been an inpatient in the last 12 months in a hospital in the UK that has had cases of CPE (London & north-west England especially Manchester);
4. have been identified as a close contact of a known CPE case (infected or colonised).

Generally healthy people are at lower risk of infection by CPEs, and it tends to be individuals who have spent a long time in health care settings, or have had high levels of antibiotic use who are affected. However, it is important to note that some cases have been identified who do not have any of the risk factors above.

**What can be done to reduce the risk from carbapenem resistant organisms?**
Public Health England (PHE) has produced a ‘toolkit’ for Health and Social Care Trusts, to help them take measures to prevent the spread of CPEs, which has been endorsed by the Northern Ireland Chief Medical Officer. It provides advice on best practice for the detection, management and control of CPE infections and colonisations. The resource can be found at:
Hospitals and healthcare professionals must pay careful attention to the correct and appropriate use of antibiotics and observe a high standard of hygiene and infection control measures as CPEs can be spread through direct contact. It is also important to ensure that there is appropriate monitoring and surveillance of antibiotic resistance in Trusts.

Members of the public can also play a part, for example by being careful to use antibiotics as directed by their doctor or pharmacist, by informing their healthcare providers if they have had treatment in a hospital abroad, and also by advising all healthcare staff involved of any infections they have been diagnosed with previously.

**What is the Public Health Agency doing?**

When PHA Duty Room is notified of a CPO infection or colonisation, information is collected from colleagues about the organism and the clinical context. This enables a risk assessment to be undertaken and appropriate advice to be given regarding infection control. The information obtained is collated in a core dataset which is maintained by PHA. This ongoing surveillance enables monitoring of trends, identification of risks factors and can help to alert us to potentially linked cases.

PHA has also provided all trusts with additional information and resources to assist with contingency planning for CPE risk assessment and management, and is working with infection prevention and control teams to agree a standard package of resources that can be used across Trusts in NI to facilitate clear communication and continuity in management.

In conclusion, CPEs pose a significant threat to the health of our population, and it is essential that healthcare professionals at all levels are aware of these organisms and work together to take measures to prevent and control infections.

**References**

- Public Health England - acute Trust toolkit for the early detection, management and control of Carbapenemase-producing Enterobacteriaceae

- Public Health England – Topics: Carbapenem resistance

**Dr J Ewing, Specialist Registrar Public Health (ST1)**
Influenza Surveillance in Northern Ireland

The influenza surveillance programme was established by the Communicable Disease Surveillance Centre Northern Ireland (CDSCNI) in 2000. The overall aim of the programme is to monitor the incidence of influenza in Northern Ireland and aid in the delivery of the public health service through the provision of information about the disease.

The main components in the collection of data for the influenza programme include; in-hours and out-of-hours primary care surveillance, out-of-hours surveillance, virological information, ICU monitoring, emergency department attendances through the EDSSS (Emergency Department Syndromic Surveillance System), surveillance of all-cause and excess mortality, and vaccine uptake monitoring.

The sentinel GP surveillance programme consists of 37 GP practices representing each of the 5 Trust areas and provides the spine of the surveillance programme. Each practice provides weekly data on number of GP flu and flu-like illness (FLI) consultations throughout the year and most practices also submit swabs for virological testing on suspected flu cases during the season. Out-of-hours centres provide weekly data on the number of flu/FLI calls to the service, providing a method of comparing the burden of flu/FLI between the in-hours and out-of-hours services.

Virological data is obtained weekly from Regional Virology Lab (RVL). The frontline service impact and severity of flu during the season is estimated using data on influenza cases in ICU, while the EDSSS provides data on patients presenting to emergency departments with Flu/FLI symptoms in two HSCTs.

Mortality data is collected weekly from NISRA and includes all-cause mortality, mortality related to respiratory conditions, mortality related specifically to influenza enabling calculation of excess mortality from flu over the season.

The influenza surveillance system also monitors uptake of influenza vaccine among cohorts defined by the Chief Medical Officer. This allows for both regular monitoring of uptake during the season and comparison with other regions across the UK.

A bulletin is published regularly throughout the flu season by PHA which provides up to date information on these areas: [http://www.publichealth.hscni.net/directorate-public-health/health-protection/seasonal-influenza](http://www.publichealth.hscni.net/directorate-public-health/health-protection/seasonal-influenza)

2013/14 Influenza Season

In 2013/14 influenza virus began circulating around the beginning of January 2014 and continued until around mid-late April 2014, having peaked in mid-March. The 2013/14 influenza season did not last as long as the previous season and was generally noted at lower levels. Sentinel GP flu/FLI consultation rates peaked in March 2014 with a consultation rate of 39.2 per 100,000 population in comparison with a peak of 87.0 per 100,000 population in January the previous season. GP flu/FLI consultation rates in 2013/14 more closely resembled the trend noted in 2011/12 with community syndromic indicators not exceeding the baseline threshold at any time during the season (Figure 1).

Pandemic influenza A (H1N1) pdm09 was the dominant strain throughout the 2013/14 season, followed by influenza A (H3) which had been the strain most detected in 2011/12 and the co-dominant strain in 2012/13 along with influenza B (Figure 1).

Although there were lower rates of flu circulating in the community and there were only 3 outbreaks in hospitals and care homes, compared to 42 in the previous season; there were similar numbers of admissions to ITU as the previous season and more deaths of those cases on ITU.
Of the ITU cases, most had risk factors making them eligible for the flu vaccine, but only half of those eligible were vaccinated. This reinforces the need for all people with risk factors to be immunised against flu every year.

Figure 1: Sentinel GP consultation rate per 100,000 population for combined flu and flu-like illness 2011/12 - 2013/14 with positive detections of influenza

We are once again about to embark on the seasonal flu vaccination campaign in order to reduce the potential risks associated with influenza infection to those at particular risk and the wider public. Last year we had a relatively mild flu season with the usual good uptake of flu vaccine in most of the eligible groups.

<table>
<thead>
<tr>
<th>Clinical Risk Group vaccinated</th>
<th>% uptake of flu vaccine 2013/14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group ≥ 65 years of age</td>
<td>75.4%</td>
</tr>
<tr>
<td>Clinical “at risk” groups &lt;65 years of age</td>
<td>76.4%</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>58%</td>
</tr>
<tr>
<td>2 &amp; 3 year old pre-school children</td>
<td>55.5%</td>
</tr>
<tr>
<td>Primary School Year 6 children (pilot)</td>
<td>80.5%</td>
</tr>
<tr>
<td>Frontline Health &amp; Social Care workers</td>
<td>24%</td>
</tr>
</tbody>
</table>
It is hoped that this year we can sustain our impressive flu vaccination uptake rates for the clinical “at risk” groups and improve the uptake rates among frontline Health and Social Care staff in whom the uptake rate is relatively low in comparison to other areas of the UK.

The Trusts will be offering a wide range of opportunities for frontline Health and Social Care staff in the community, as well as Trust employed staff, to avail of the flu vaccine. Details of all Trust flu vaccine clinics will be disseminated before the end of September. Immunisation of all frontline healthcare workers is very important to protect themselves, their families and their patients from flu. There are no changes to the clinical “at-risk” groups this year, though the second phase of the implementation of the recommendation to offer flu vaccination to all children aged between 2 and 16 years old inclusive, commences in October.

The second phase involves offering flu vaccine to all pre-school children aged 2, 3 and 4 years old, in Primary Care and to all children in Primary School P1-P7 inclusive, via the School Health Nursing teams. The School Health team will offer vaccines to all Primary School children, including those in “at risk groups” whom the GP would normally have invited into the practice for vaccination in previous years. GP practices will still have to invite all those who are in risk groups, but not at Primary School, for vaccination as usual. In addition any child in Primary School who does not receive flu vaccines on the day the school nurses visit (e.g. due to absenteeism) will be advised to request the vaccine from the GP and the GP will be paid for this. In addition a small number of Primary School children will require a second dose of flu vaccine, and again parents of these children will be advised to contact the Practice for the second dose 4 weeks after the first dose has been given.

The overall aim of the extended programme to vaccinate children against flu is to lower morbidity and mortality associated with flu across all sectors of the community, by directly protecting children and by reducing transmission to others. It is expected that this programme will substantially reduce flu-related illness, GP consultations, hospital admissions and deaths from flu. Initial evidence from the various childhood flu vaccination pilot sites in 2013 across the UK appears to support this assertion. Detailed information on the Seasonal Flu vaccination campaign 2014/15 can be found at:


http://www.publichealth.hscni.net/sites/default/files/HSC_workers_flu_leaflet.pdf

http://www.fluawareni.info/

Ms M Loughrey, Health Protection Nurse
Group A Streptococcal Infection

Group A streptococci (GAS) cause a wide range of illnesses from non-invasive disease such as pharyngitis to more severe invasive infections such as necrotising fasciitis. Invasive group A streptococcal disease (iGAS) is defined as an infection associated with the isolation of group A streptococci (GAS) from a normally sterile body site. The iGAS spectrum includes:

(i) group A streptococcal toxic shock syndrome differentiated from other types of iGAS infections by shock and multi-organ system failure early in the course of infection

(ii) necrotising fasciitis characterised by extensive local necrosis of subcutaneous soft tissues and skin, and

(iii) infections characterised by the isolation of GAS from a normally sterile site in patients not meeting the criteria for streptococcal toxic shock syndrome or necrotising fasciitis. Included in this group are bacteraemia with no identified focus and focal infections such as meningitis, pneumonia, peritonitis, puerperal sepsis, osteomyelitis, septic arthritis, myositis, and surgical wound infections (Health Protection Agency, Group A Streptococcus Working Group, 2004)

Since the beginning of 2014, there have been 44 cases of iGAS reported to the PHA Duty Room. The majority of notifications are reported from laboratories, through laboratory test results or verbal reports from microbiologists or biomedical scientist, however, a hospital clinician can also makes the notification. Occasionally, there is conflict between the laboratory and clinical report, the laboratory isolate indicates an iGAS, but the clinical picture of the patient indicates a differing diagnosis.

IGAS notifications initiate a public health response, whereby the Health Protection team endeavor to prevent further transmission in the community, through identifying close contacts of an iGAS case, advising them to be vigilant for symptoms of GAS such as a sore throat and a load grade fever, and report any symptoms to their GP. In addition, the Health Protection team will liaise with the contact’s GP, advising them of the recommended actions, should their patient present with GAS symptoms.

Health Protection Agency, Group A Streptococcus Working Group (2004) recommends that antibiotics should only be administered:

- to mother and baby if either develops invasive group A streptococcal disease in the neonatal period (first 28 days of life);
- to close contacts if they have symptoms suggestive of localised Group A streptococcal infection i.e. sore throat, fever, skin infection;
- to the entire household if there are two or more cases of invasive group A streptococcal disease within a 30 day time period.

Where chemoprophylaxis is indicated, oral Penicillin V is the drug of choice; however, Azithromycin is a suitable alternative for those allergic to penicillin.

More information on the management of close community contacts of cases of iGAS can be obtained from the links below:


Ms J Farrell, Health Protection Nurse
Hepatitis B Update

The World Health Organisation suggests that up to 780,000 people die every year due to consequences of hepatitis B, such as liver cirrhosis and liver cancer. Although a global health problem, it is the only blood-borne virus which is vaccine preventable. Presently the UK vaccination programme is not universal and pre-exposure immunisation is used for individuals who are at increased risk of hepatitis B because of their lifestyle, occupation or other factors.


Hepatitis B virus (HBV) is a viral infection carried in the blood causing inflammation of the liver and potentially long term damage. The virus is transmitted by contact with an infected person's blood or body fluids. The average incubation period for hepatitis B is 40 to 160 days. Some people with acute infection experience flu-like symptoms including sore throat, tiredness, joint pains and nausea. Acute infection can be severe and cause abdominal discomfort and jaundice. Chronic HBV infection occurs after acute infection among about 90% of infants infected at birth, 25-50% of children infected at 1-5 years of age and about 1-5% of persons infected as older children and adults. Chronic hepatitis is infectious and can lead to liver damage, yet people can be asymptomatic and therefore unaware of their infection for many years. Hepatitis B is a notifiable disease in Northern Ireland.

Where a blood or sexual exposure has led to a perceived HBV risk, post exposure immunisation with hepatitis B vaccine should be offered. High risk exposures to a person known to be infectious for HBV may warrant consideration of hepatitis B immunoglobulin. This should be given as soon as possible and ideally within 48 hours, although may still be considered up to a week after exposure. The Health Protection Duty Room can provide advice on when immunoglobulin may be indicated.

Screening for hepatitis B infection in risk groups

Primary care has an important role to play in relation to screening patients from high prevalence countries. Prevalence of hepatitis B is highest in sub-Saharan Africa and East Asia. Most people in these regions become infected with the hepatitis B virus during childhood and between 5–10% of the adult population are chronically infected. High rates of chronic infections are also found in the Amazon and the southern parts of eastern and central Europe. Practices should consider screening for hepatitis B, particularly among those who have recently arrived from a risk country. This can be done by testing the patient’s hepatitis B surface antigen level (HBsAG). Further country specific advice re assessing migrant health, along with advice on other diseases the patient may be at risk from, e.g. hepatitis C, HIV and TB can be found at [http://webarchive.nationalarchives.gov.uk/20140714084352/http://www.hpa.org.uk/web/HPAweb&Page&MigrantHealthAutoList/Page/1281953108731](http://webarchive.nationalarchives.gov.uk/20140714084352/http://www.hpa.org.uk/web/HPAweb&Page&MigrantHealthAutoList/Page/1281953108731).

Hepatitis B Surveillance update for Northern Ireland

- 2014 to date (31/08/2014)
  - 12 Acute cases; 60 Chronic caseplus
  - 30 Antenatal cases (17 new cases)

for the same period in 2013
- 7 Acute; 51 Chronicplus
- 29 Antenatal cases (10 new cases)

89 total new cases in 2014 compared with 68 total new cases for the same period in 2013
A case of acute hepatitis B
The Health Protection Duty Room was recently notified of a patient who presented to their GP with a flu- like illness and deranged LFTs. Hepatitis B serology was in keeping with acute hepatitis B and a risk factor assessment was completed. The Duty Room issued infection control advice to the case, and recommended referral to hepatology and GUM. Contact tracing identified one sexual partner and a history of unprotected sexual intercourse within the previous 7 days, therefore the contact was at risk of acquiring hepatitis B. The Duty Room recommended urgent serology for hepatitis B (HBsAg); accelerated course of hepatitis B vaccination; and urgent hepatitis B immunoglobulin (HBIG) for the contact. The case will need a blood test in six months to ascertain whether they have cleared the disease or have become chronically infected.

Vaccinations for those with chronic hepatitis B
Patients with chronic hepatitis B are in a risk group for hepatitis A, influenza and pneumococcal infection. The mortality rate for those with chronic liver disease from influenza is 15.8 per 100,000, almost 40 times the background rate. Patients should be offered vaccination against hepatitis A, influenza and pneumococcal infection and referred to the hepatology service at the Royal Victoria Hospital or to a gastroenterologist with an interest in hepatology for follow-up.
PHA Web Links to Surveillance Data

Surveillance data on the main topics of Public Health interest are available through the following web links:

Notifications of Infectious Diseases:

Group B Streptococcus:
http://www.publichealth.hscni.net/directorate-public-health/health-protection/group-b-streptococcus

Vaccination coverage:
http://www.publichealthagency.org/directorate-public-health/health-protection/vaccination-coverage

Avian Influenza:

Brucellosis:

Gastrointestinal infections:

Hepatitis:
http://www.publichealthagency.org/directorate-public-health/hepatitis

Healthcare Associated Infections:

Meningococcal disease:

Respiratory infections:

Sexually transmitted infections:

Tuberculosis:
http://www.publichealthagency.org/directorate-public-health/health-protection/tuberculosis
DHSSPS Web Links

CMO Letters and Urgent Communications relevant to Health Protection, and issued in the three months preceding publication of this edition of Transmit, are accessible through the following web links:

CO Poisoning

We welcome your feedback on the content of Transmit. Please feel free to contact emma.walker@hscni.net with your suggestions or articles that you would like to see included.