Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

INSTITUTE OF OBSTETRICIANS & GYNAECOLOGISTS
ROYAL COLLEGE OF PHYSICIANS OF IRELAND

CLINICAL PRACTICE GUIDELINE

HYPEREMESIS AND NAUSEA/VOMITING IN PREGNANCY

Institute of Obstetricians and Gynaecologists,
Royal College of Physicians of Ireland
and the
Clinical Strategy and Programmes Division,
Health Service Executive

Version 1.0 Publication date: Nov 2015

Guideline No: 12 Revision date: Nov 2018

Contents

1. Revision History

Version No.	Date	Modified By	Description
1.0			

2. Key Recommendations

2.1 Hyperemesis gravidarum, a severe form of nausea and persistent vomiting in pregnancy, must be diagnosed and treated appropriately to reduce associated morbidities and mortality.

2.2 Diagnosis of hyperemesis gravidarum is by exclusion. Women who experience nausea and vomiting for the first time after 10 weeks' gestation are more likely to have an alternative diagnosis to nausea/vomiting in pregnancy. Be aware of potential alternative diagnoses.

2.3 There should be a low threshold for admission for women with diabetes, hyper/ hypothyroidism, epilepsy or other pre-existing conditions that may be adversely affected by nausea and vomiting. Women with diabetes should be monitored carefully as dehydration increases the risk of diabetic ketoacidosis.

2.4 The severity of the condition should be assessed using the Modified 24-hour PUQE (Pregnancy Unique Quantification of Emesis and Nausea) score.

2.5 A clear and concise plan of care should be documented. Using the Modified 24-hour PUQE score and the NVP assessment algorithm, the management plan for individual patients will be outlined.

2.6 Treatment includes the correction of hypovolemia, electrolyte imbalances and ketosis and the provision of vitamin supplementation, anti-emetic medication and thromboprophylaxis.

2.7 Consultation with a Dietitian is recommended. There is no evidence to support the effectiveness of dietary restrictions to relieve symptoms and patients are advised to avoid personal triggers of nausea.

2.8 Psychological support should also be offered to affected women with emphasis placed on the self-limiting nature of the condition.

2.9 There are a number of 'Practical Tips' included as an Appendix to the guideline which can be given to women to help them cope with NVP.

3. Purpose and Scope

This guideline is developed to assist the multidisciplinary team in the provision of best practice care for women with hyperemesis gravidarum or Nausea/Vomiting in Pregnancy. These guidelines are intended for healthcare professionals, particularly those in training, who are working in HSE-funded obstetric and gynaecological services. They are designed to guide clinical judgment but not replace it. In individual cases a healthcare professional may, after careful consideration, decide not to follow a guideline if it is deemed to be in the best interests of the woman.

3.1 The Aim of Management

- Assess severity of the condition
- Correct hypovolemia, electrolyte imbalance and ketosis
- Provide symptomatic relief to break the cycle of vomiting and prevent further vomiting
- Provide vitamin supplementation
- Provide psychological support

4. Background and Introduction

Severe vomiting requiring hospitalisation occurs in less than 1% of all pregnant women (Jarvis 2011). Symptoms manifest between 4-7 weeks' gestation, the peak severity for hyperemesis is around 11 weeks with 90% of cases resolved by 20 weeks' gestation (NICE 2013; Bottomley 2009). The cause of nausea and vomiting in pregnancy is unknown, but may be due to the rise in human chorionic gonadotrophin concentration (Festin 2009). Excessive vomiting of both solid food and liquids may lead to dehydration, ketosis, electrolyte imbalance, thyrotoxicosis and rarely vitamin deficiency in pregnancy (Kuscu 2002).

Therapeutic interventions are mainly supportive, in conjunction with anti-emetic medication. Consultation with a dietitian is recommended to obtain an accurate dietary history, advise the woman on coping strategies to optimise nutrient intake, minimise weight loss and recommend nutrition support when necessary. There is no evidence to support the effectiveness of dietary restrictions to relieve symptoms, therefore women should be encouraged to eat small frequent meals of whatever foods appeal to them (Matthews 2014). Women should be offered advice about the self-limiting nature of the condition and advised to avoid personal triggers of nausea. Women with diabetes should be monitored carefully as dehydration increases the risk of diabetic ketoacidosis.

5. Methodology

A search of PubMed from 1966 to January 2015 was carried out. Relevant MeSH terms for pregnancy and keywords, including "nausea and vomiting in pregnancy", "hyperemesis", and relevant medication names were used.
This guideline was initially developed by Fiona Dunlevy, Frances Richardson and Brian Cleary. The updated guideline was developed by Laura Harrington, Paula Byrne, Mary O'Reilly and Brian Cleary.

The guideline was reviewed by Dr Carmen Regan (CWIUH), Prof John Morrison (Galway), Dr Maire Milner (Drogheda), Dr Meabh Ni Bhuinneain (Mayo), Dr Orla Sheil (NMH), Dr Sharon Cooley (Rotunda), Dr Keelin O'Donoghue (Cork), Dr Sam Coulter Smith (Rotunda), Dr Joe Quigley (Drogheda), Dr Brigette Byrne (CWIUH), Prof Louise Kenny (Cork), Triona O'Sullivan, (Cork), Ms Mary Doyle (Limerick), Dr Michael Brassil (Portiuncula), Dr Miriam Doyle (Portlaoise), Dr Niamh Hayes (Rotunda), Dr Jennifer Donnelly (Rotunda), Dr Ann McHugh (TCD).

6. Clinical Guidelines on Hyperemesis and Nausea/Vomiting in Pregnancy

Nausea and vomiting are common in pregnancy, affecting 70% of women in the first trimester (NICE 2013). Hyperemesis gravidarum is a severe form of nausea and persistent vomiting in pregnancy which occurs in 1% of all pregnancies (Jarvis 2011; Jewell 2003).Care must be planned to meet the individual needs of the women concerned.

Hyperemesis is associated with:

- Weight Loss
- Ketonuria
- Electrolyte imbalance and dehydration
- Vitamin and mineral deficiencies
- Thyroid/renal/hepatic dysfunction

6.1 Diagnosis of Hyperemesis Gravidarum

Diagnosis is by exclusion. A thorough clinical assessment should be carried out. Women who experience nausea and vomiting for the first time after 10 weeks' gestation are more likely to have an alternative diagnosis to NVP (Ebrahimi 2010).

6.2 Be Aware of Potential Differential Diagnoses or Pre-disposing Conditions

- Urinary tract infection

- Multiple pregnancy
- Gastrointestinal (for example, infection including *Helicobacter pylori*, reflux oesophagitis, gastritis, cholecystitis, peptic ulceration, hepatitis, appendicitis, pancreatitis, complications after bariatric surgery)
- Neurological (for example, migraine, raised Intracranial pressure, central nervous system diseases)
- Molar pregnancy
- Ear, nose, and throat disease (for example, labyrinthitis, Ménière's disease, vestibular dysfunction)
- Drugs and supplements (such as opioids and iron- some prenatal multivitamin preparations contain iron which may exacerbate NVP)
- Metabolic and endocrine disorders (such as hypercalcaemia, Addison's disease, uremia, and thyrotoxicosis)
- Persistent vomiting in diabetic women which may suggest autonomic neuropathy
- Psychological disorders (such as eating disorders)

6.3 Complications

6.3.1 Maternal Complications

- Dehydration
    - increases the risk of diabetic ketoacidosis in those with type 1 diabetes
    - increases the risk of thromboembolism along with immobilisation
- Electrolyte disturbances as seen in any patient with persistent vomiting – hypochloraemic alkalosis, hypokalaemia and hyponatraemia
- Protein-calorie malnutrition
- Vitamin/mineral deficiencies and accompanying problems – e.g. thiamine deficiency can cause Wernicke's encephalopathy, a serious neurological disorder associated with acute mental confusion, short term memory loss, ataxia, ocular abnormalities such as nystagmus and peripheral neuropathy. Wernicke's encephalopathy can lead to irreversible neurological impairment (Tan 2001; Selitsky 2006).
- Folate deficiency, leading to iron deficiency
- Thyroid dysfunction – e.g. "pseudo-thyrotoxicosis" – suppressed TSH with high free thyroxine resulting from thyroid stimulation by HCG
- Renal dysfunction – (reversible) elevated urea and creatinine
- Hepatic dysfunction accompanying hyperemesis – elevated ALT, AST, low albumin, elevated bilirubin, due to malnutrition and catabolic changes
- Ulcerative oesophagitis
- Psychological morbidity e.g. post-traumatic stress disorder
- Mallory –Weiss tears

6.3.2 Fetal Complications

- Fetal loss as a result of maternal Wernicke's encephalopathy (Selitsky 2006)

- Intrauterine growth restriction (IUGR) or small for gestational age infants associated with prolonged hyperemesis /multiple admissions and loss of >5% body weight (Bailit 2005)
- Undernutrition in early pregnancy during fetal programming increases risk of chronic illness in adult life of the offspring (Novak 2002; Godfrey 2000; Barker 1998)

6.4 Assessment

6.4.1 Take a detailed history

The PUQE (Pregnancy Unique Quantification of Emesis and Nausea) scoring index is a validated assessment tool to determine the severity of nausea vomiting in pregnancy (NVP), taking into account feelings of well-being (Lacasse 2008; Ebrahimi 2009). It is a useful tool for determining treatment course.

Modified 24-hour PUQE Score

1. On average in a day, for how long have you felt nauseated or sick to your stomach?

Symptom	Not at all	1 hour or less	2-3 hours	4-6 hours	> 6 hours
Score	(1)	(2)	(3)	(4)	(5)

2. On average in a day, have you vomited or thrown up...

Symptom	7+ times	5-6 times	3-4 times	1-2 times	Did not throw up
Score	(5)	(4)	(3)	(2)	(1)

3. On average in a day, how many times have you had retching or dry heaves without bringing anything up?

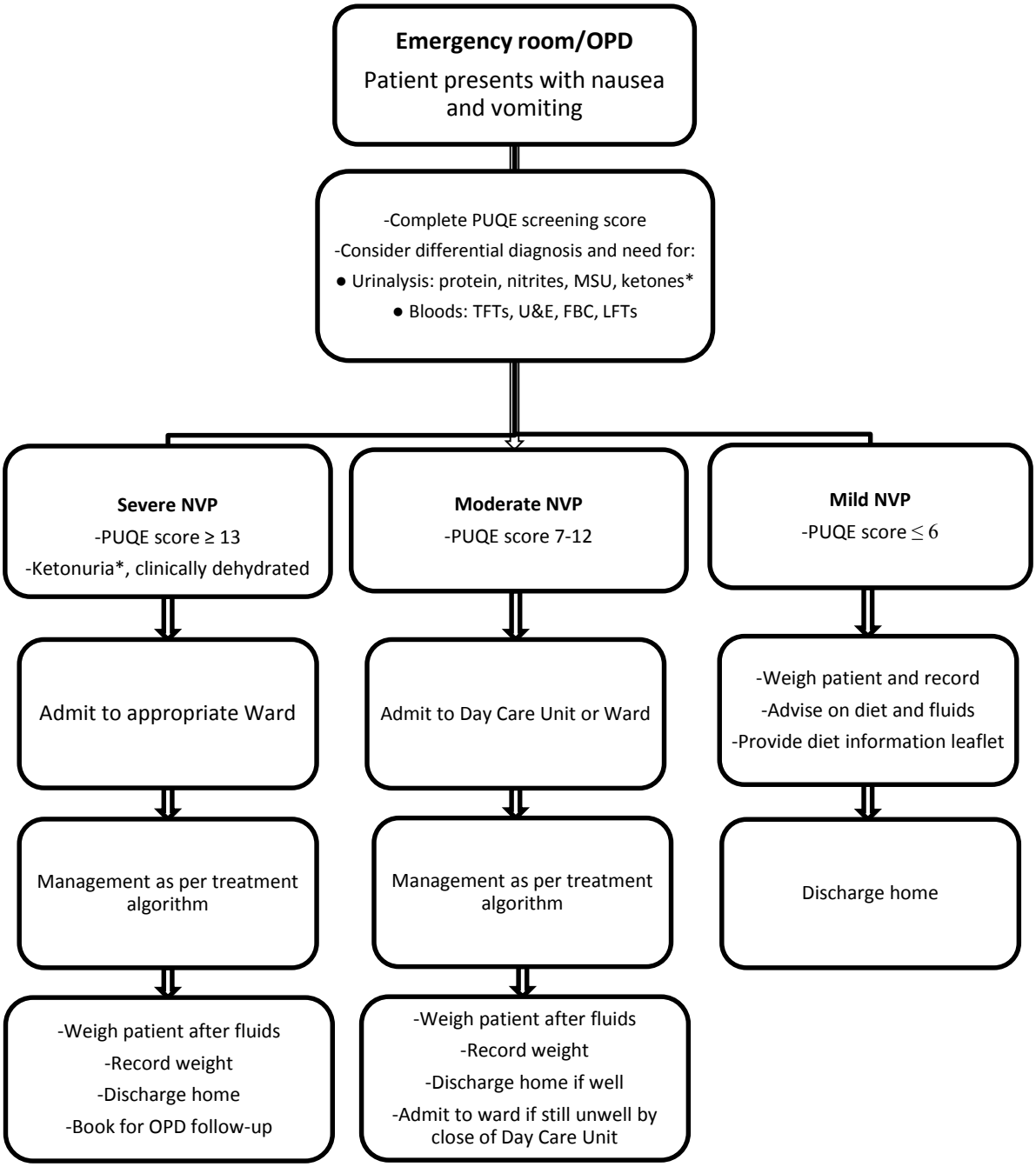
Symptom	Not at all	1 -2	3-4	5-6	7 or more
Score	(1)	(2)	(3)	(4)	(5)

Total Score questions 1-3:_____

Key: Mild ≤ 6
Moderate 7 - 12
Severe ≥ 13

On a scale of 0 to 10, how would you rate your well-being? _____
(0 = worst possible, 10 = best you felt before pregnancy)

NVP assessment algorithm



*Ketonuria may occur sporadically during normal pregnancy (Chez 1987). Ketonuria alone should not be used to assess the severity of NVP, but should be interpreted in light of the overall clinical picture.

6.5 Management

- Correct dehydration and electrolyte imbalance
- Intravenous administration of Pabrinex I/II vitamin solution as prophylaxis against Wernicke's encephalopathy (NICE 2010)
- Provide symptomatic relief (see treatment algorithm)
- Provide psychological support
- Complete assessment and management checklist for each treatment day and re-admission and place in chart (see attached checklist).

Three maternal deaths in women with hyperemesis were reported in the most recent Confidential Enquiry in the UK (Knight et al 2014). One epileptic patient died during a hospital admission. The review highlighted insufficient medical review prior to her death, undiagnosed hypokalaemia and an inability to ingest medications due to vomiting. Two further deaths occurred in women with marked biochemical thyrotoxicosis**.**

The Confidential Enquiry report recommended: "Women with hyperemesis gravidarum should be treated with antiemetic therapy, thiamine, low molecular weight heparin and electrolyte disturbance, particularly hypokalaemia, should be corrected."

There should be a low threshold for admission for women with diabetes, hyper- or hypothyroidism, epilepsy or other pre-existing conditions that may be adversely affected by nausea and vomiting.

6.5.1 Emergency Room or Outpatients Department (mild NVP)

- PUQE score ≤6
- Weight patient and record in chart
- Advise on dietary management and adequate fluids
- Provide diet information leaflet (see Appendix 1) and discharge home

6.5.2 Criteria for admission to the Day Care Unit or appropriate Ward (moderate NVP)

Any of the following:

- PUQE score 7-12
- Weight loss
- Clinical signs of dehydration
- Ketonuria

Investigations

- Obtain full medical history
- Urine dipstick for ketonuria
- Full blood count (FBC), urea and electrolytes for hypokalaemia and hyponatraemia, liver function test, (LFT) and thyroid function (TFT)

- Send MSSU to the laboratory for culture and sensitivity
- Obtain baseline weight/ BMI

6.5.3 Day Care or Out-patient Management (moderate hyperemesis)

PUQE score 7-12 will require management as per algorithm. Adequate hydration is crucial for optimal management.

- If the woman is unable to tolerate oral fluids and ketotic, commence intravenous fluids (Hartmann's or sodium chloride 0.9%). Infuse first litre over 1-2 hours and then reassess the patient, including urine ketone testing. Further IV fluids if required should be run at 1000mls over 4 hours, followed by further assessment.
- Commence fluid balance chart
- Record physiological observations on IMEWS chart
- Reassure the woman and allow to rest
- Encourage oral fluids and dietary intake of small, frequent amounts of preferred foods
- IV fluids should be discontinued when ketonuria has resolved and preferably when the woman is able to maintain oral fluids
- See treatment algorithm for prescribing antiemetic medications
- Arrange an ultrasound to confirm single, viable pregnancy and rule out molar or multiple pregnancy (nausea and vomiting is more common in multiple and or molar pregnancy)
- Weigh the woman and record in the assessment and management checklist. If urinalysis is negative for ketones and the woman is fully hydrated, she can be discharged from day- care with advice on nutrition and lifestyle management. See Appendix 1 for patient information leaflet "Practical tips for coping with nausea and vomiting".
- The woman should be informed to continue taking the antiemetic prescribed and the need to return to hospital if still unwell.
- The woman should be advised to avoid self-medication or the use of treatments outside of those recommended in the treatment algorithm to avoid delays in the appropriate medical assessment and management of their condition.

If the woman is still unwell at close of Day Care, blood electrolytes are abnormal or ketonuria is present, she should be admitted for ongoing treatment.

6.5.4 In-patient management (severe NVP/hyperemesis or transfer or transfer from day care)

PUQE score ≥13 or if insulin dependent diabetic, patient requires admission and management as per algorithm or to tertiary unit if diabetes services do not exist

- Correct hydration as above with IV fluids, whilst maintaining strict fluid balance record.
- Check each urine sample for ketones
- Insulin-dependent diabetics must be managed carefully to prevent hypo- and hyperglycaemia. Seek advice from an endocrinologist or refer to local guidelines for the management of diabetes in pregnancy.

- IV vitamin supplementation (Pabrinex I/II) will be required for all women with prolonged vomiting (e.g. women requiring IV fluids for more than 24 hours) and should be repeated at weekly intervals if the patient remains admitted for treatment of NVP or is readmitted with severe NVP (County Durham and Darlington NHS 2008, Jarvis and Nelson-Piercy 2011, Mid Essex Hospital Service 2013). Mix ampoule 1 and ampoule 2, dilute with 50ml-100ml of normal saline or glucose 5% and administer over 30 minutes (Archimedes Pharma UK Limited 2007). Caution: anaphylactic reactions have been reported rarely during, or shortly after, parenteral administration of Pabrinex. Resuscitation facilities should be available
- Diabetics requiring glucose infusion must be given Pabrinex I/II concurrent with or immediately after commencing dextrose/glucose infusion. Thiamine deficiency followed by glucose infusion precipitates Wernicke's encephalopathy.
- Record full physiological observation at least daily on the IMEWS chart (more frequent depending on general wellbeing)
- Encourage small, frequent oral fluids and foods based on the patient's personal preferences
- If the serum potassium level is found to be less than 3.2mmol/l, potassium supplements should be given. Potassium is a high alert medication. Ready-mixed potassium infusions should be used.
- Refer to dietitian for assessment of nutritional needs
- Provide psychological support
- Administer antiemetics as prescribed. Note patients with severe hyperemesis may require more than one antiemetic to control symptoms. See treatment algorithm
- Apply anti-embolic stockings for women who are bed ridden, risk assess as per hospital guideline for venous thromboembolism (VTE)
- Daily U & E to assess electrolyte balance
- Assess bowel function daily

6.5.5 Criteria for discharge

- No ketones in the urine
- Tolerating oral fluids and food without vomiting
- Appropriate antiemetic prescription provided
- Patient given information leaflet on diet and lifestyle management (see Appendix 1)

6.5.6 Recurrant admissions

Repeat assessment and treatment algorithms

6.5.7 Ongoing management as in-patient

- IV fluids, antiemetic and vitamin supplement as above
- Record PUQE score daily on assessment and management checklist
- Encourage frequent small amounts of oral fluids and meals to patient's taste
- Apply anti-embolic stockings

- Inform dietitian of admission
- Weigh the patient at least weekly, or as directed by the dietitian
- Nutritional support (naso-gastric feeding or total parental nutrition (TPN)) may be required in protracted cases where there is:
    - Significant weight loss or failure to achieve an appropriate gestational weight gain (see Appendix 2 for recommended weight gain)
    - Low body mass index (BMI) or underweight
    - Significant vitamin deficiencies
    - Persistently abnormal LFTs
- If a decision is made for naso-gastric/ TPN feeding close communication will be required with the dietitian and pharmacist for administration. Staff must adhere to strict infection control measures.
- Assess VTE risk as per hospital guideline
- Provide ongoing psychological support
- On discharge from hospital arrange follow-up antenatal care to include monitoring for fetal growth restriction

NVP Treatment Algorithm (Arsenault 2002; NICE 2010; BNF 2015)

If there is no improvement, proceed to the next step

Give Cariban (doxylamine 10mg and pyridoxine 10mg): one capsule in the morning, one in the afternoon and two at bedtime)
Adjust schedule and dose according to severity of symptoms

↓

Add either:
Promethazine (Phenergan) 25mg up to 3 Times daily PO‡
Or
Prochlorperazine (Stemetil) 5mg 8hourly PO†‡
Or
Prochlorperazine (Buccastem) 3mg 12hourly buccally†‡
Or
Cyclizine (Valoid) 50mg 8hourly PO‡

No Dehydration
If not tried already add any of the following
- Prochlorperazine 5mg 8hourly PO **or** 3mg 12hourly buccally **or** 12.5mg 8hourly IM*
- Promethazine 12.5 to 25mg 8hourly IM
- Ondansetron 4 to 8mg 8hourly PO

→

Dehydration
- Start IV fluid replacement with Hartmann's solution or NaCl 0.9%
- IV vitamin supplementation Pabrinex I/II to be given and repeated once weekly if patient remains in hospital or is readmitted with dehydration from NVP.
- Consider need for IV potassium replacement (use ready- mix bottles of NaCl 0.9% with 20mmol or 40 potassium per litre)

↓

If not tried previously,
Add any of the following:
- Promethazine12.5 to 25mg 8hourly IM*
- Prochlorperazine 12.5mg 8hourly IM *
- Metoclopramide 5 to 10mg 8hourly IV*

↓

Consider:
Ondansetron 4mg to 8mg 8 hourly IV
Hydrocortisone 100mg 12 hourly IV

Note:
-Use of this algorithm assumes that other causes of nausea and vomiting in pregnancy have been ruled out.
-At any stage patients may require Ranitidine 150mg 12 hourly for the management of dyspepsia.
-At any step, when indicated, consider enteral feeding via a nasogastric tube or total parenteral nutrition.
-None of the listed medications are licensed for management of nausea and vomiting in pregnancy in Ireland.

‡ Patients should be warned of increased sedative effects possible with combination treatment.

† Extrapyramidal effects and oculogyric crises may occur with prochlorperazine.

*Only use parenteral formulations if oral products are not tolerated.
Consult Summary of Product Characteristics for full prescribing data.

NVP Treatment Algorithm Supporting Information

Pyridoxine/Doxylamine (Cariban®)

The most extensively studied NVP medication with regard to safety in pregnancy is the antiemetic combination of vitamin B6 (pyridoxine) and the antihistamine doxylamine (ACOG 2004). US and UK formulations of the product (Bendectin® and Debendox®, respectively) were withdrawn by the manufacturer in 1983 due to excessive costs of defending non-meritorious lawsuits alleging teratogenicity. Numerous epidemiological studies, performed as a consequence of this litigation, have demonstrated that pyridoxine/doxylamine does not affect the incidence of congenital anomalies (Ebrahimi 2010, McKeigue 1994). The US Food and Drug Administration and the UK Committee on Safety of Medicines have both noted that the product was not withdrawn from sale for reasons of safety or effectiveness (Brent 2003, Patten 1983).

Prior to its withdrawal, 20-30% of US pregnant women used Bendectin (Brent 1995). Millions of pregnant women took Bendectin in this period. A Canadian parliamentary assessment of the safety of pyridoxine/doxylamine in the 1980s led to the Canadian product (Diclectin®) remaining on the market. A Spanish formulation (Cariban®) is also available though not yet licensed in Ireland. Women should be informed that this medicine is not licensed by the Irish regulator (the Health Products Regulatory Authority), but it is licensed by the Spanish regulator for the treatment of NVP. In 2013 the US FDA licensed a formulation of pyridoxine/doxylamine (Diclegis ®) for the treatment of NVP in women who do not respond to conservative management.

The combination of doxylamine and pyridoxine has been demonstrated to reduce NVP in randomised, placebo-controlled trials. (Koren 2010, Koren 2011). This combination has been highlighted as a first line treatment for NVP in Canadian (Arsenault 2002) and US clinical guidelines (ACOG 2004). Agreement on the efficacy of pyridoxine/doxylamine is not universal (Persaud 2014).

Promethazine

There is extensive historical experience of promethazine use in NVP (Lask 1953, Kullander 1976). More recent studies provide reassuring data on pregnancy outcomes after early pregnancy promethazine exposure (Anderka 2012, Asker 2005).Drowsiness, dizziness, dystonia and medication discontinuation were reported more frequently with promethazine in a recent RCT comparing interventions for NVP (Tan 2010).

Prochlorperazine

Data from two cohort studies with a total of approximately 1500 exposed pregnancies did not indicate that prochlorperazine exposure was associated with congenital anomalies (Briggs 2015). A US study indicated that prochlorperazine

is commonly prescribed in pregnancy, though less commonly than promethazine (1.1% vs. 10.9% of all deliveries; Toh 2013).

Cyclizine

Cyclizine is a commonly prescribed antiemetic for NVP in the UK (Bottomley 2009). Data are available from the Swedish Medical Birth Register on pregnancy outcomes for over 2000 women who used cyclizine in early pregnancy (Källén 2009). No association between cyclizine use in early pregnancy and congenital anomalies was found.

Ondansetron

Several studies have provided reassuring data on gestational ondansetron exposure (Pasternak 2013, Colvin 2013, Einarson 2004). Some studies have suggested an association between first trimester ondansetron exposure, cleft palate (Anderka 2012) and possibly cardiovascular defects (Koren 2014). A recent trial demonstrated the efficacy of ondansetron for NVP (Oliveira 2014). Recommendations on the use of ondansetron in pregnancy include reserving it for use where other treatments have failed (Schaefer 2015) and delaying use until after 10 weeks' gestation (Briggs 2014).

Hydrocortisone

Hydrocortisone has been associated with dose-related teratogenic and toxic effects in animal studies (Briggs 2014). Several epidemiological studies support an association between first trimester steroid exposure and orofacial clefts and other adverse outcomes (Park-Wyllie 2000, Anderka 2012). Hydrocortisone should be reserved for cases where other treatment options have failed or are unsuitable.

MANAGEMENT OF NAUSEA AND VOMITING

Assessment and Management Checklist

Complete checklist at all clinical contacts with patients experiencing NVP

ADDRESSOGRAPH

Assessment Date:_____

On average in a day, for how long do you feel nauseated or sick to your stomach?

Not at all	≤1 hour	2-3 hours	4-6 hours	>6 hours
(1)	(2)	(3)	(4)	(5)

On average in a day, how many times do you vomit or throw up?

≥7 times	5-6 times	3-4 times	1-2 times	Do not throw up
(5)	(4)	(3)	(2)	(1)

On average in a day, how many times do you have retching or dry heaves without bringing up anything?

None	1-2 times	3-4 times	5-6 times	≥7 times
(1)	(2)	(3)	(4)	(5)

	Day 1	Day 2	Day 3
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Total	_____	_____	_____
Signed	_____	_____	_____

(Mild NVP ≤ 6, Moderate NVP 7-12, Severe NVP ≥13)

On a scale of 0 to 10, how would you rate your well-being? 0 (worst possible) 10 (the best you felt pre-pregnancy). Well-being score day 1 ___ day 2___ day 3___

☐Urinalysis performed (MSU if indicated)
☐Blood sample for U&E
☐Admit patient **or**
☐Arrange ambulatory care **or**
☐Discharge

Treatment of NVP
☐Oral medication prescribed
☐Parenteral medication prescribed
☐IV Fluids prescribed

Current weight (after fluids) _____

If admitted
☐Fluid balance chart commenced
☐Vital signs charted
☐Pabrinex IV vitamin supplement administered
Date and time of cannulation:_____
Intravenous fluids started at: _____

Upon Discharge
☐If relevant arrange subsequent ambulatory care
☐Provide patient information leaflet "Practical tips for coping with nausea and vomiting"

Last known weight _____

7. References

American Congress of Obstetricians and Gynecologists (2004) 'ACOG Practice Bulletin #52: Nausea and Vomiting of Pregnancy'. *Obstetrics & Gynecology,* 103(4), 803-16.

Anderka M, Mitchell AA, Louik C, Werler MM, Hernandez-Diaz S, Rasmussen SA. (2012) 'Medications used to treat nausea and vomiting of pregnancy and the risk of selected birth defects'. *Birth Defects Research A Clinical and Molecular Teratology,* 94(1), 22-30.

Archimedes Pharma UK Limited (2007) '*Summary of Product Characteristics-Pabrinex Intravenous High Potency Solution for Injection or Infusion* 'Available at: http://www.medicines.ie/medicine/15548/SPC/Pabrinex/. Accessed: 8th April 2015. (Archived by WebCite® at http://www.webcitation.org/6XdjDAwHE).

Arsenault MY, Lane CA, MacKinnon CJ, Bartellas E, Cargill YM, Klein MC, et al. *(*2002) 'The management of nausea and vomiting of pregnancy'. *Journal of obstetrics and gynaecology Canada,* 24(10), 817-831.

Bailit JL. (2005) 'Hyperemesis gravidarum: Epidemiologic findings from a large cohort'. *American Journal of Obstetrics and Gynecology*, 193(3), 811-814.

Barker DJ. (1998) 'In utero programming of chronic disease'. *Clinical Science (Lond)*, 95(2), 115-28.

Bottomley C, Bourne T. (2009) 'Management strategies for hyperemesis'. *Best Practice & Research Clinical Obstetrics & Gynaecology,* 23(4), 49-64.

Brent RL. (1995) 'Bendectin: Review of the medical literature of a comprehensively studied human non-teratogen and the most prevalent tortogen-litigen'. *Reproductive Toxicology*, 9(4), 337-49.

Brent R. (2003) 'Bendectin and Birth Defects: Hopefully, the Final Chapter'. *Birth Defects Research Part A - Clinical and Molecular Teratology*, 67(2), 79-87.

Briggs G, Freeman RK. (2015) *Drugs in pregnancy and lactation: a reference guide to fetal and neonatal risk*. 10th ed: Lippincott Williams & Wilkins.

British Medical Association and the Royal Pharmaceutical Society of Great Britain (2015) *British National Formulary*.

Chez RAM, Curcio FDIM. (1987) 'Ketonuria in Normal Pregnancy'. *Obstetrics & Gynecology,* 69(2), 272-274.

Colvin L, Gill AW, Slack-Smith L, Stanley FJ, Bower C. (2013) 'Off-label use of ondansetron in pregnancy in Western Australia'. *BioMed Research International*. 2013:909860.

County Durham and Darlington NHS. (2008) '*Hyperemesis Gravidarum'* Available at: http://www.cddft.nhs.uk/media/199346/20111129110719649.pdf. Accessed: 8th April 2015. (Archived by WebCite® at http://www.webcitation.org/6XdjSfVOd).

Ebrahimi N, Maltepe C, Einarson A. (2010) 'Optimal management of nausea and vomiting of pregnancy'. *International Journal of Women's Health,* 2, 241-248.

Ebrahimi N, Maltepe C, Bournissen FG, Koren G. (2009) 'Nausea and vomiting of pregnancy: using the 24-hour Pregnancy-Unique Quantification of Emesis (PUQE-24) scale'. *Journal of obstetrics and gynaecology Canada,* 31(9), 803-807.

Einarson A, Maltepe C, Navioz Y, Kennedy D, Tan MP, Koren G. (2004) 'The safety of ondansetron for nausea and vomiting of pregnancy: a prospective comparative study'. *British Journal of Obstetrics & Gynaecology*, 111(9), 940-3.

Erick M. (2004) 'Managing Morning Sickness: A Survival Guide for Pregnant Women'. *Bull Publishing Company*.

Festin, M. (2009) 'Nausea and vomiting in early pregnancy.' *Clinical Evidence BMJ Publishing Group Ltd*. Available at: www.clinicalevidence.com

Godfrey KM, Barker DJ. (2000) 'Fetal nutrition and adult disease'. *The American Journal of Clinical Nutrition* 71(5 Suppl), 1344s-52S.

Haugen M, Vikanes A, Brantsaeter AL et al. (2011) 'Diet before pregnancy and the risk of hyperemesis gravidarum'. *British Journal of Nutrition,* Aug 106(4), 596-602. Epub 2011 Apr 18.

Jarvis S, Nelson-Piercy C. (2011) 'Management of nausea and vomiting in pregnancy'. *British Medical Journal* Jun 17, 342:d3606. doi: 10.1136/bmj.d3606.

Jewell D. (2003) 'Nausea and vomiting in early pregnancy'. *American Family Physician* 68(1), 143-4.

Källén B. (2009) 'Drugs During Pregnancy'. New York: Nova Science.

Knight M, Kenyon S, Brocklehurst P, Neilson J, Shakespeare J, Kurinczuk J J (Eds.) on behalf of MBRRACE-UK (2014). *'Saving Lives, Improving Mothers' Care - Lessons learned to inform future maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2009–12'*. Oxford: National Perinatal Epidemiology Unit, University of Oxford.

Koren G, Clark S, Hankins GDV, Caritis SN, Miodovnik M, Umans JG, et al. (2010)'Effectiveness of delayed-release doxylamine and pyridoxine for nausea and vomiting of pregnancy: a randomized placebo controlled trial'. *American Journal of Obstetrics & Gynecology*203 (6), 571.e1-571.e7.

Koren G, Maltepe C, Gow R. (2011) 'Therapeutic Choices for Nausea and Vomiting of Pregnancy: A Critical Review of a Systematic Review'. *Journal of obstetrics and gynaecology Canada* 33 (7), 733-5.

Koren G. (2014) 'Scary Science: Ondansetron Safety in Pregnancy-Two Opposing Results From the Same Danish Registry'. *Therapeutic Drug Monitoring 36(1)*.

Kullander S, Kallen B. (1976) 'A prospective study of drugs and pregnancy. II. Anti-emetic drugs'. *Acta Obstetricia et Gynecologica Scandinavica* 55(2), 105-11.

Kuscu, N.K. and Koyuncu, F. (2002) 'Hyperemesis gravidarum: current concepts and management'. *Postgraduate Medical Journal* 78(916), 76-79.

Lacasse A, Rey E, Ferreira E, Morin C, Berard A. (2008) 'Validity of a modified Pregnancy-Unique Quantification of Emesis and Nausea (PUQE) scoring index to assess severity of nausea and vomiting of pregnancy'. *American Journal of Obstetrics and Gynecology* 198(1), 71.e1-71.e7.

Matthews A, Haas DM, O'Mathuna DP, Dowswell T, Doyle M. (2014) 'Interventions for nausea and vomiting in early pregnancy'. *Cochrane Database of Systematic Reviews*. Mar 21; CD007575.

McKeigue PM, Lamm SH, Linn S, Kutcher JS. (1994)'Bendectin and birth defects: I. A meta-analysis of the epidemiologic studies'. *Teratology* 50(1), 27-37.

Mid Essex Hospital Service NHS (2013). '*Management of Hyperemesis Gravidarum in Pregnancy'.* Available at http://www.meht.nhs.uk/about-us-/policies-and-guidelines/?assetdet82735=2699&p=22. Accessed: 8th April 2015. (Archived by WebCite® at http://www.webcitation.org/6XdjqlU4n)

National Institute for Health and Care Excellence (NICE) (2010) CG100 'Alcohol-use disorders: Diagnosis and clinical management of alcohol-related physical complications'.

National Institute for Health and Care Excellence (NICE) (2013) 'Clinical Knowledge Summaries: Nausea/vomiting in pregnancy'.

Novak D. (2002) 'Nutrition in early life. How important is it?' *Clinics in Perinatology* 29(2), 203-23.

Oliveira LG, Capp SM, You WB, Riffenburgh RH, Carstairs SD. (2014)'Ondansetron compared with doxylamine and pyridoxine for treatment of nausea in pregnancy: a randomized controlled trial'. *Obstetrics & Gynecology*, 124(4), 735-42.

Park-Wyllie L, Mazzotta P, Pastuszak A, Moretti ME, Beique L, Hunnisett L, et al. (2000)'Birth defects after maternal exposure to corticosteroids: Prospective cohort study and meta-analysis of epidemiological studies'. *Teratology* 62(6), 385-392.

Pasternak B, Svanström H, Hviid A. (2013) 'Ondansetron in Pregnancy and Risk of Adverse Fetal Outcomes'. *New England Journal of Medicine* 368(9), 814-23.

Patten J. Debendox (Withdrawal). In: House of Commons- Written Answers, editor. London, 1983.

Persaud N, Chin J, Walker M. (2014) 'Should doxylamine-pyridoxine be used for nausea and vomiting of pregnancy?' *Journal of Obstetrics and Gynaecology Canada*, 36(4), 343-8.

Schaefer C, Peters PW, Miller RK. (2015)*Drugs during pregnancy and lactation: treatment options and risk assessment*. 3rd ed: Academic Press.

Sechi GP and Serra A. (2007) 'Wernicke's encephalopathy: New clinical settings and recent advances in diagnosis and management. *The Lancet* 6 (5), 442-455.

Selitsky T, Chandra P, Schiavello HJ. (2006)'Wernicke's encephalopathy with hyperemesis and ketoacidosis'. *Obstetrics & Gynecology*107:486–490.

Tan JH, Ho KH. (2001) 'Wernicke's encephalopathy in patients with hyperemesis gravidarum'. *Singapore Medical Journal* 42 (3),124-5.

Tan PC, Khine PP, Vallikkannu N, Omar SZ. (2010) 'Promethazine compared with metoclopramide for hyperemesis gravidarum: a randomized controlled trial'. *Obstetrics & Gynecology* 115(5), 975-81.

Toh S, Li Q, Cheetham TC, Cooper WO, Davis RL, Dublin S, et al. (2013) 'Prevalence and trends in the use of antipsychotic medications during pregnancy in the U.S., 2001-2007: a population-based study of 585,615 deliveries'. *Archives of Women's Mental Health*. 16(2), 149-57.

Wegrzyniak LJ, Repke JT, Ural SH. (2012) 'Treatment of hyperemesis gravidarum'. *Reviews in Obstetrics and Gynecology* 5(2):78-84.

8. Implementation Strategy

- Distribution of the guideline to all members of the Institute and to all maternity units.
- Distribution to the Director of the Acute Hospitals for dissemination through line management in all acute hospitals.
- Implementation through HSE Obstetrics and Gynaecology Programme local implementation boards.
- Distribution to other interested parties and professional bodies.

9. Qualifying Statement

These guidelines have been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. Clinical material offered in this guideline does not replace or remove clinical judgment or the professional care and duty necessary for each pregnant woman. Clinical care carried out in accordance with this guideline should be provided within the context of locally available resources and expertise.
This Guideline does not address all elements of standard practice and assumes that individual clinicians are responsible for:

- Discussing care with women in an environment that is appropriate and which enables respectful confidential discussion.
- Advising women of their choices and ensure informed consent is obtained.
- Meeting all legislative requirements and maintaining standards of professional conduct.
- Applying standard precautions and additional precautions, as necessary, when delivering care.
- Documenting all care in accordance with local and mandatory requirements.

10. Appendices

APPENDIX 1:

Practical tips for coping with nausea and vomiting

Nausea and vomiting is common during the first three months of pregnancy. It usually eases by 16 weeks but can lead to weakness, weight loss and poor nutrition.

The following tips may help you cope and get the benefit of some nutrition, even when you are feeling unwell.

1. Eat little and often:

- Take small snacks and meals every 2 to 3 hours. Try to take food and drinks separately. Often dry meals are better tolerated.

- Try to eat something light such as dry toast, crackers or plain biscuits before getting out of bed in the morning. Then wait about 15 to 20 minutes before getting out of bed.

- Try cold foods or easy to prepare foods such as sandwiches and ready meals until symptoms settle.

- Take whatever food you are drawn to. Think of what flavours, temperature and textures that appeal to you:
    - Sweet, salty, bitter or sour
    - Hot, warm or cold
    - Crunchy, dry or soft
    - Thin, wafer-like slices or small cubes

Ideas for snacks:

- **Breakfast cereals with or without milk**
- **Toast or crackers**
- **Thinly sliced fruit**
- **Plain digestives, Marietta or rich tea biscuits**
- **Hot or cold milky drinks: hot chocolate, Horlick's, Ovaltine, Complan**
- **Sandwiches made with wafer-thin chicken, ham, or cheese**
- **Light, broth-base soup, Bovril or Oxo**
- **Baked beans on toast or a baked potato**
- **Plain thin spaghetti, noodles or rice**
- **Rice pudding**
- **Yogurt**

1. **Take plenty of fluids:**

   - Aim to drink at least 8 cups of fluid per day.
   - If you cannot tolerate tap water, try bottled water, flavoured water, weak tea, diluted fruit juice or fizzy drinks allowed to go flat.
   - Try ice pops, ice lollies, jelly or ice cream if you cannot take fluids.
   - Clear soups or broth and juicy fruits can add to your fluid intake.

2. **Other helpful tips:**

   - Take your folic acid every day until you are 12 weeks' pregnant. It may be best to take a complete vitamin and mineral supplement made for pregnant women after the first 12 weeks.
   - Avoid having to rush in the morning, when symptoms are often worse. Prepare your clothes and shower before bed time rather than in the morning if it is easier.
   - Avoid strong smells such as perfumes and cooking odours.

- Get some extra rest. You need more sleep during the first 3 months of pregnancy and becoming overly tired can make the nausea worse.

- Ask for help from others. Your partner, family and friends can help by doing some shopping, cooking and cleaning to allow you to get more rest.

Do not worry if your diet is not the best while you are sick. Try to eat enough to keep your energy up and prevent weight loss.

Once the sickness fades, aim to eat a healthy, balanced diet. You can read more about healthy eating for pregnancy and food safety advice in the maternity information pack from the outpatient appointments desk.

You should see your doctor if you cannot keep any fluids down and are losing weight. You can ask your doctor or midwife for a referral to see the dietitian as well.

APPENDIX 2:

Audit Tool

Two to three charts of women with NVP who attend the Emergency Room (ER) and/or are admitted to Day Care or Gynaecology Ward will be reviewed quarterly to ensure the guideline is being implemented. The auditor will be a member of the implementation team.

Parameter	Yes	No
Was the PUQE score performed and documented in this treatment episode?		
Was the patient treated in accordance with the NVP treatment algorithm?		
If there was a deviation from the guideline, is this recorded and rationale for same explained?		
Was a clear and concise plan of care documented?		

At the time of the chart review the auditor will interview midwifery, nursing and/or obstetric staff in ER, Day Care or Gynaecology Ward at random:

Parameter	Yes	No
Are you aware that a NVP guideline exists?		
Are you aware of the PUQE scoring tool?		
Do you have access to the guideline?		
Have you read the guideline?		

Auditor:

_____

Ward (circle one): ER Day Care Gynaecology

Staff interviewed (circle one): Midwifery Nursing Obstetric