

Practice Recommendations
for the Nutritional Management of
Anorexia Nervosa in Adults

Developed by

Alison Wakefield APD & Hazel Williams APD

Contents

Executive Summary 1

Introduction 6

Recommendations and Evidence 14

General Practice Recommendations 17

Summary of Practice Recommendations 17

Appendix 1: Background to Practice Recommendations and Practice Tips..... 19

Appendix 2: Assessment details 36

Appendix 3: Diagnostic Criteria 38

Appendix 4: Psychology of starvation 40

References..... 41

List of Tables

<i>Table 1: Consultation and Development of Recommendations</i>	9
<i>Table 2: NHMRC levels of evidence 1999 Definition of Evidence Categories¹</i>	14
<i>Table 3: NHMRC Additional Levels of Evidence and Grades 2005-2007 Pilot Program²</i>	14
<i>Table 4: Summary of papers reviewed for evidence in nutritional management of AN</i>	15
<i>Table 5: Biochemical measurements for diagnosis¹⁹</i>	20
<i>Table 6: Other medical parameters for diagnosis¹⁹</i>	22
<i>Table 7: Anthropometric, biochemical and medical intervention¹⁹</i>	24
<i>Table 8: Dietary History and Nutritional Assessment</i>	36
<i>Table 9: Some of the abnormal eating behaviours in anorexia nervosa</i>	37

Executive Summary

These recommendations aim to support dietetic practice, identify gaps in knowledge and evidence based practice, and to indicate potential areas in need of research for the dietetic management of adults diagnosed with anorexia nervosa. The recommendations can also be adapted for use with people who have sub-clinical AN or Eating Disorders Not Otherwise Specified (EDNOS). The expected health benefits of the recommendations are to minimise nutritionally related medical complications of the illness and facilitate nutritional and medical recovery. Anorexia nervosa is part of a wider spectrum of eating disorders such as Bulimia Nervosa (BN) and Binge Eating Disorder (BED) which are not covered in these practice recommendations.

Management of adult anorexia nervosa is across many settings from inpatient to community-based clinics. Nutritional management should always be provided in collaboration with medical and psychological therapies.

A number of clinical questions were developed during a series of workshops with dietitians working in the area of anorexia nervosa. These questions are:

- What specific measures best reflect nutritional status, abnormal eating behaviours and abnormal attitudes in patients with anorexia nervosa?
- What are the defining diagnostic characteristics that describe the nutritional status, abnormal eating behaviours and abnormal attitudes in adult anorexia nervosa patients?
- What are the requirements of the dietitian treating anorexia nervosa in adults?
- What are the appropriate nutritional interventions to optimise nutritional status?
- What are the ways that dietitians can help patients achieve normal eating behaviour and normal attitudes to food?
- What are the outcomes to be monitored and evaluated to determine the progress of nutritional care in adult patients with anorexia nervosa?

Despite a wide literature search very little research was found associated with dietetic practice in the management of anorexia nervosa. No levels of evidence (NHMRC 1999, 2005)^{1,2} could be assigned to any of the clinical questions, due to the lack of suitable research studies. The literature search generated 947 articles but after exclusion criteria only four are used in these recommendations. The lack of randomized clinical trials (RCT) for any type of clinical management of anorexia nervosa makes the writing of evidence based guidelines for dietetic practice impossible. Therefore these recommendations are based on universal standards of best practice developed through a process of extensive consultation with dietitians and health professionals working in this area and related consumer associations to create recommendations, based on consensus of expert opinion.

The recommendations cover three main areas:

1. Appropriate access to care
 - Nutritional Status
 - Eating behaviours
 - Attitudes
2. Quality nutrition care
 - Diagnostic characteristics
 - Requirements dietitian treating AN in adults

- Nutritional interventions
 - Ways to achieve normal eating behaviours and attitudes to food
3. Nutrition monitoring and evaluation
- Monitoring and evaluation nutritional care

Evidenced based research is needed for improved treatment outcomes, along with identification of effective primary and secondary interventions³. To develop evidence based practice guidelines more research is needed. Suggested areas of research could include:

- An assessment tool to rate degree of nutritional and behavioural abnormalities in AN, and to link degree of severity with appropriate intervention.
- Best practice for delivering nutritional management of AN, to achieve optimal outcomes for weight gain, changes in eating attitudes, and normalisation of eating behaviours.
- Accurate assessment for risk of re-feeding syndrome, in order to better guide prescription of preventative measures.
- The optimal rate of weight gain for recovery.
- Appropriate training for dietitians to competently manage AN.

Nutrition research is confounded by the overlap with psychological and medical interventions. This can make data difficult to extrapolate and interpret.

The development of these recommendations was unfunded and commenced in 1999. Many dietitians working in the area of eating disorders have been involved in supporting the two authors in creating this document.

Introduction

Scope and Purpose

These recommendations address the nutritional management of adults^a with anorexia nervosa. The expected health benefits of the recommendations are to minimise nutritionally related medical complications of the illness and facilitate nutritional and medical recovery. The recommendations can also be adapted for use with people who have sub-clinical AN, or Eating Disorders Not Otherwise Specified (EDNOS), where it relates to AN. These conditions may not meet all the diagnostic criteria for AN, but where the symptoms are the same they should be treated with a similar approach.

AN in children and adolescents, Bulimia Nervosa (BN), Binge Eating Disorder (BED) and other atypical eating disorders are not covered by these recommendations.

Due to a lack of supporting evidence it was not possible to develop evidence based practice guidelines. Instead universal standards of best practice in nutritional management of AN, or consensus of best practice are described in the absence of evidence based treatments.

The aim is to provide standardised recommendations to support dietetic practice, identify gaps in knowledge and evidence based practice, and to indicate potential areas in need of research.

The recommendations can also be adapted for use with people who have sub-clinical AN, or Eating Disorders Not Otherwise Specified (EDNOS), where it relates to AN. These conditions may not meet all the diagnostic criteria for AN, but where the symptoms are the same they should be treated with a similar approach.

Target Users

The recommendations have been designed for use by dietitians in various health settings including hospital wards, specialist units and outpatient settings, in urban or rural environments.

Recommendation Development Process

The Appraisal of Guidelines for Research and Evaluation (AGREE) instrument⁴ was used to ensure that the recommendations were developed according to high standards.

The following steps were identified as central to the process of identifying sources of rigorously objective, peer-reviewed information: and reviewing, grading, and synthesising the literature to generate recommendations.

^a The definition of “adult” in this context is intended to incorporate physical maturity and relative independence from parental supervision, although the person may reside in the parental home. The legal adult age is usually taken as 18 years.

Recommendations Authors

Alison Wakefield and Hazel Williams oversaw the project and ensured that there were contributions from many other dietitians working in the eating disorders area. Input was obtained from several doctors of medicine and consumer representatives.

Defining recommendations topics and clinical questions

The clinical questions facing dietitians working with AN patients were brainstormed in the Dietitians Association of Australia (DAA) Eating Disorders Interest Group (EDIG), in 1999 for the Royal Australian and New Zealand college of psychiatrists (RANZCP) AN guidelines⁵. Dietetic clinical questions were brainstormed by the NSW EDIG in 2004 and 2005 and in a workshop at the 24th National DAA Conference in 2006. The clinical questions for dietetic treatment were also made available on the EDIG list-serve for review and comment. Due to the large number of clinical questions generated, feedback from the DAA Practice Advisory Committee (PAC) and a DAA advisor was to streamline the clinical questions to fit the format of the Nutrition Care Process⁶

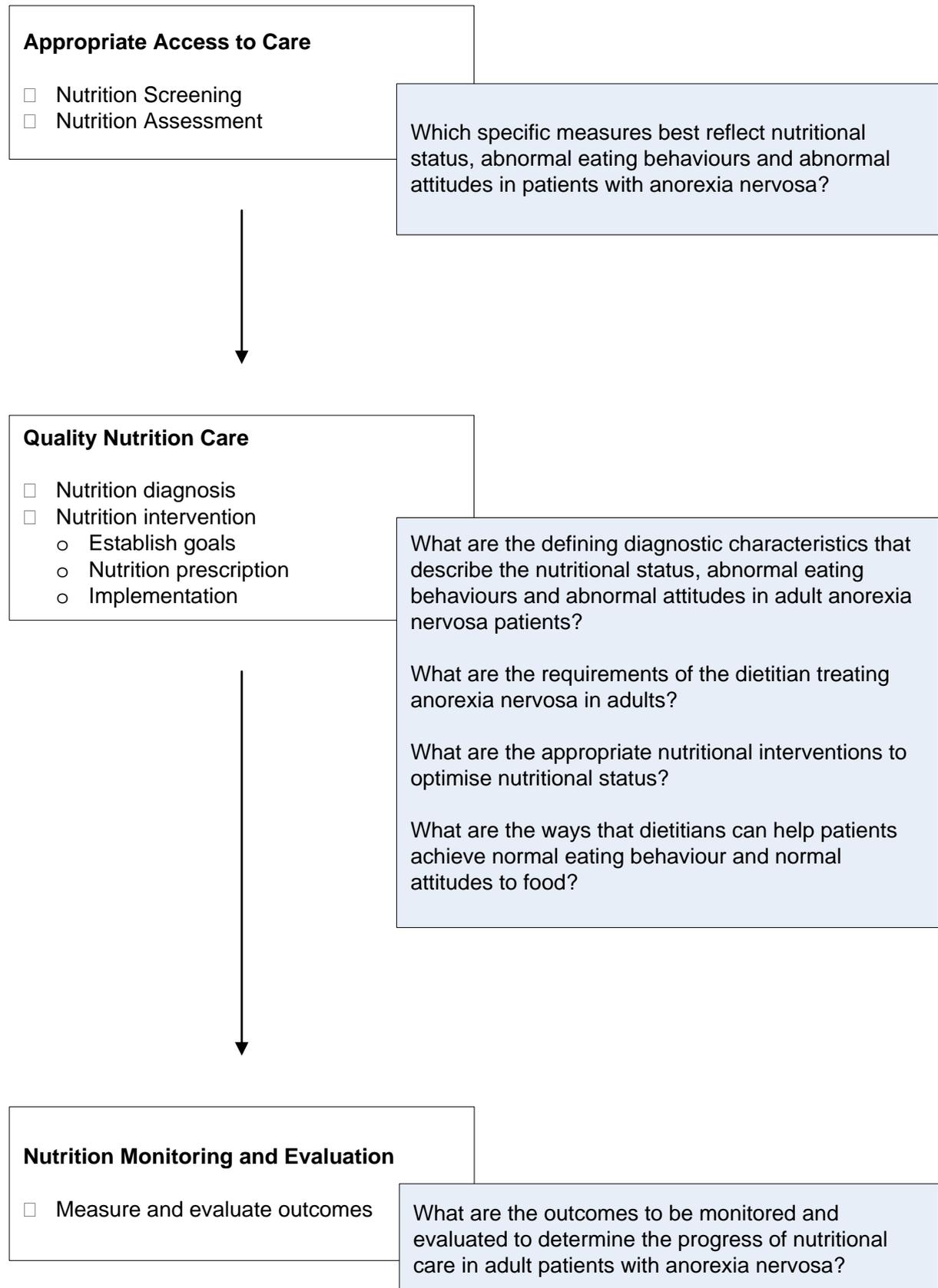
Six major clinical questions were selected for inclusion in these recommendations taking into consideration the findings of the surveys and workshops. The first two questions address nutrition assessment and diagnosis as well as monitoring and evaluation of nutrition management. The third question considers the competencies of the dietitian involved on the treatment of anorexia nervosa in adults. Questions 4 to 6 address nutrition intervention, monitoring and evaluation.

The major clinical questions were:

- Which specific measures best reflect nutritional status, abnormal eating behaviours and abnormal attitudes in patients with anorexia nervosa?
- What are the defining diagnostic characteristics that describe the nutritional status, abnormal eating behaviours and abnormal attitudes in adult anorexia nervosa patients?
- What are the requirements of the dietitian treating anorexia nervosa in adults?
- What are the appropriate nutritional interventions to optimise nutritional status?
- What are the ways that dietitians can help patients achieve normal eating behaviour and normal attitudes to food?
- What are the outcomes to be monitored and evaluated to determine the progress of nutritional care in adult patients with anorexia nervosa?

These clinical questions formed the basis for the development of the evidence based practice guideline framework.

EVIDENCE BASED PRACTICE GUIDELINE FRAMEWORK ⁶



Literature search strategy

A systematic review of the literature was undertaken.

A search utilising Cinahl, Ovid, International Journal of Eating Disorders, PsyINFO, Embase, Medline, Pubmed, Psych lit current contents, EXTRAMED and CCCTR – 1967 -2007 was implemented using the key words: anorexia nervosa and: enteral/nasogastric feeding; dietitian; nutrition; re-feeding; treatment; weight gain; weight; diet; diet composition; malnutrition.

The search bases for other evidence based guidelines were reviewed for studies relevant to nutritional management of anorexia nervosa: Eating Disorder Guidelines from NICE, UK⁷; Position of the American Dietetic Association (ADA), Nutrition intervention in the treatment of anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified^{8, 4}; American Psychiatry Association Practice guidelines for the treatment of patients with eating disorders⁹; Australian and New Zealand clinical practice guidelines for the treatment of anorexia nervosa⁵. Hand searches of the literature were also made with the research working party.

A literature review was also undertaken, in collaboration with PhD students specialising in the presentation and nutritional management of AN, to establish leading nutrition papers missed by the search base.

Critical appraisal and grading of evidence

Evidence based statements and recommendations were developed using consultation with key others, literature searches and grading of evidence. Due to the lack of evidence the practice recommendations have been developed in the place of evidence statements.

Consultation process

Table 1: Consultation and Development of Recommendations

Date	Process	Outcome
1999 - 2003	Approximately 260 persons, professionals and consumers, were involved in the development of the RANZCP clinical practice guidelines for AN 1999–2003. This document had a number of sub committees, one devoted to nutrition guidelines.	A summary of the Australian and New Zealand clinical practice guideline for the management of AN (2003) was published in the Australian and New Zealand Journal of Psychiatry in 2004 ⁵ .
2003	Draft I Correspondence with DAA to publish Nutrition Management of AN in adults, developed for RANZCP.	10.11.2003 DAA initially noted the guidelines needed minor edits and could then be published on DAA's resource database, Dietetic Information and Nutrition Education Resource (DINER).
2004		03.02.2004 Communication that DAA guideline endorsement process was under review and to progress guidelines

		utilising the NHMRC checklist. A number of consultation steps needed to be taken before guidelines would be considered for endorsement.
2004	NHMRC protocol was followed for re-writing the guidelines. Re-reviewed published literature on nutrition management of AN. Draft II was circulated to EDIG members for comment and submitted to DAA PAC.	Draft II endorsed by EDIG 20.07.2004 Areas not meeting the NHMRC guidelines were defined by PAC.
2004-2005	One of the authors attended a DAA workshop on writing and formulating guidelines to meet DAA standards. Formed research review group. Reviewed literature and hand-selected journals from relevant articles and PhDs. Number of meetings with DAA officer to review guidelines against requirements for DAA endorsement.	Clinical questions streamlined using Hakei-Smith & Lewis ⁶ . Developed Draft III guidelines. Plan to submit guidelines nationally to DAA members. Two evaluation forms were developed to assess the clinical questions and guideline format.
May 2006	A workshop "Dietetic practice guidelines for anorexia nervosa in adults – a review" was held at the DAA 24 th National Conference, Sydney. Fourteen people attended and reviewed guideline recommendations. Twenty one clinical questions were generated by attendees at the workshop.	The 2 workshops and 2 web-based requests generated 13 completed evaluation forms on proposed evidence statements. There were 23 forms on overall evaluation received. There was a high consensus of agreement with statement made regarding expert opinion.
13.06.2006	The guidelines were put on the DAA website for consultation with all DAA members.	
30.06.2006	A workshop was run by NSW EDIG Branch in June 2006 to review the guidelines using evaluation forms. There were 10 attendees.	
18.07.2006	The guidelines were circulated on the Australian and New Zealand Academy of Eating Disorders (ANZAED) website for comment.	
22.12.2006	New template for writing DAA guidelines circulated. Complete rewrite of guidelines to match new template. New literature search conducted.	
2007-2008	Guideline discussions with DAA officers overseeing guideline endorsement process.	Draft IV of guidelines developed. Evaluation forms devised to assess reliability and validity of the guidelines using a standardised case

		study and a questionnaire.
2008	Accredited Practising Dietitians piloted the guidelines (draft IV) with a case study on the DAA website.	There were 10 responses. Draft V of guidelines was developed integrating comments from DAA members.
2008	The two consumer guidelines for clinical practice guidelines in Psychiatry ⁷ were reviewed.	Review of the two consumer guidelines noted that Draft V guidelines met consumer recommendations, as developed by two working consumer committees for the RANZCP guidelines ⁵ .
2008	An email was sent out in 2008 to the consumer groups found on the NSW Eating Disorders Foundation (EDF) web page for Australia, in NSW, Victoria, Tasmania, South Australia, Queensland and the Butterfly Foundation, requesting interest for providing feedback for the nutritional guidelines.	EDF (NSW), EDFV (Victoria) and the Butterfly Foundation responded to the invitation, and guidelines were sent to them for comment. A few grammatical changes to the document were integrated.
2008	Draft V of the guidelines were sent to reviewers by DAA National Office using the AGREE tool for review. Methodology of the guideline development reviewed by DAA Associate Editors.	Review gave positive comments. Comments from DAA integrated into draft guidelines. Draft VI of guidelines developed. Re-write of document based on practice recommendations.
January 2009	Draft VI submitted to DAA	Review by DAA Board recommend name change and addition of an executive summary.
May 2009	Revised Draft VI submitted to DAA Board	Guidelines endorsed by DAA Board and named 'Practice Recommendations'.

Implementation and Audit

It is recommended that the nutritional management of adult anorexia nervosa is reviewed against these recommendations. Evaluation is necessary to determine whether or not the recommendations have an effect on improving clinical practice.

Applying the Recommendations

Application of these recommendations in a service or a clinic depends upon the expertise of the dietitian and the willingness of the organisation or managing doctor to incorporate nutritional management. In in-patient settings these recommendations would be most successfully applied within a specialist program with suitably trained dietetic, nursing and psychological staff. A structured team approach in any setting is always the preferred option due to the complex and recalcitrant nature of the illness, but is limited by the availability of appropriate professionals.

The cost implications of treatment would be in setting up structured specialised units in metropolitan and rural areas. The cost of providing nutritional management would be in the advanced training or mentoring required for the level of expertise; also the

extended consultation times and frequency of consultations that are often required for these patients.

Recommendation Updates

These recommendations should be reviewed in 2012 or earlier, should pertinent information become available from studies currently underway.

The next review may identify new RCTs to support the development of evidence based practice guidelines rather than practice guidelines.

Responsibility and Support for the Recommendations

Editorial independence

The recommendations were developed without the assistance of external funding. Therefore there is no external influence on the content of the recommendations. Neither of the main authors has any conflict of interest to declare relating to the development of these recommendations. There are no known conflicts of interest for the other contributors.

Acknowledgements

Name	Position	Location
Kate Beckett	Dietitian	NSW
Ali Almawal	Dietitian	NSW
Georgina Boston	Dietitian	NT
Terrill Bruere	Dietitian	VIC
Sarah Card	Dietitian	NSW
Anjanette Casey	Dietitian	NSW
Elesa Crowley	Dietitian	NSW
Jo Cumarasamy	Dietitian	NSW
Anita Darby	Dietitian	QLD
Dr Jane Elmslie	Dietitian	NZ
Claire Fitzgerald	Dietitian	SA
Elizabeth Frig	Dietitian	NSW
Sue Gehrig	Dietitian	NSW
Deanne Harris	Dietitian	NSW
Mel Hart	Dietitian	NSW
Susan Hart	Dietitian	NSW
Tanya Hazelwood	Dietitian	NSW
Shane Jefferies	Dietitian	QLD
Deanna Jenkins	Dietitian	QLD
Sally Johnson	Dietitian	SA
Julie Kennedy	Dietitian	NSW
Sally Livock	Dietitian	QLD
Megan Lorimer	Dietitian	NSW
Tara MacGregor	Dietitian	NSW
Rachel Martin	Dietitian	VIC
Kelly Monger	Dietitian	NSW
Julie Norton	Dietitian	QLD
Maureen O'Connor	Dietitian	VIC

Vicki Paulin	Dietitian	NZ
Jennie Pomplun	Dietitian	NSW
Sue Scarlet	Dietitian	NZ
Nerrisa Soh	Dietitian	NSW
Helen Storey	Dietitian	NSW
Wendy Swan	Dietitian	VIC
Claire Toohey	Dietitian	NSW
Julie Viney	Dietitian	VIC
Katherine Warth	Dietitian	QLD
Jemma Watkins	Dietitian	QLD
Melissa Whitelaw	Dietitian	VIC
Paul Wilkinson	Dietitian	QLD
Julie Williams	Dietitian	TAS
Melissa Wood-Baker	Dietitian	TAS
Sue Zbornik	Dietitian	NSW
Laird Birmingham	Professor of Medicine	Canada
Phillipa Hay	Professor of Mental Health	University of Western Sydney, NSW
Justine Turner	Paediatrician	WA
Romy Roth	Consumer representative	Direct Relief Project Officer, The Butterfly Foundation, VIC
Telle Meridith	Consumer representative	Consumer, Eating Disorders Foundation of Victoria. CEED
Natalie Wild	Consumer representative	Recovery Support Officer, Eating Disorders Foundation Inc, VIC
Greta Kretchmer	Consumer representative	Eating Disorders Foundation Inc NSW

Recommendations and Evidence

Levels of evidence and recommendation grading

The strength of the evidence was assessed using the level of evidence rating system recommended by the National Health and Medical Research Council (NHMRC) publication, A Guide to Development, Implementation and Evaluation of Clinical Practice Guidelines¹. See Table 1.

Table 2: NHMRC levels of evidence 1999 Definition of Evidence Categories¹

I	Evidence obtained from a systematic review of all relevant random controlled trials (RCTs).
II	Evidence obtained from at least one properly designed RCT.
III – 1	Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method).
III – 2	Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case controls or interrupted time series with control.
III – 3	Evidence obtained from comparative studies with historical control, two or more single arm studies or interrupted time series with a parallel control group.
IV	Evidence obtained from case series, either post test or pre test and post test.

NHMRC Additional Levels of Evidence and Grades of Recommendations for Developers of Guidelines-Pilot Program 2005 were used to assess the body of evidence and provide an indication to the strength of each recommendation².

Table 3: NHMRC Additional Levels of Evidence and Grades 2005-2007 Pilot Program²

Level A	Body of evidence can be trusted to guide practice
Level B	Body of evidence can be trusted to guide practice in most situations
Level C	Body of evidence provides some support for recommendation(s) but care should be taken in its application
Level D	Body of evidence is weak and recommendation(s) must be applied with caution

Appropriate evidence found relating to nutrition management of AN was assessed for suitability. A core research group evaluated the literature search. Literature exclusion criteria were: studies of adolescents; individual case studies; studies irrelevant to nutrition-dietetic practice; and non-English translated papers. All other studies relevant to dietetic practice were included.

Health benefits, side effects and risks

Known benefits of nutritional management of AN are that re-feeding and rehydration will improve medical status. However, there is the risk of re-feeding syndrome unless appropriate precautions are taken (see re-feeding syndrome). Psychological symptoms also usually improve with improved nutrition but are not necessarily resolved. Nutritional management should always be provided in collaboration with medical and psychological therapies³. The risk of providing nutritional management alone is that medical and psychological issues are not addressed and can escalate.

Ongoing nutrition intervention is dependent on the patient's continued motivation to change. Steinhausen (2002) found that less than one half of cases have a good outcome, a third intermediate and the remainder poor¹⁰.

Current evidence on treatment:

Two dietary counselling random controlled trials (RCTs) have been highlighted in the literature^{11,5}.

- I. In comparing Cognitive Behavioural Therapy (CBT) and dietary advice all members of the dietary group dropped out of treatment. Anorexic, depressive symptoms and body mass index (BMI) improved with CBT¹².
- II. A trial of outpatients with severe AN compared dietary advice with combined individual and family therapy. Patients in both conditions improved overall, with better weight gain in the dietary advice group and enhanced sexual and social adjustment in those receiving therapy¹³.

A Cochrane review on efficacy of various forms of outpatient individual therapy for adults with AN could not draw any conclusions because of insufficient evidence¹⁴. Few RCTs have examined treatments for AN¹⁵. The lack of research evidence has rendered National Institute for Health and Clinical Excellence: Eating Disorders⁷ (NICE) guidelines in the UK only able to conclude that no specific treatments can be recommended for AN treatment.

Guidelines from America: Position of the American Dietetic Association: Nutrition Intervention in the Treatment of Anorexia Nervosa, Bulimia Nervosa, and Other Eating Disorders 2006; American Psychiatry Association: Practice guidelines for the treatment of patients with eating disorders 2000, and the UK: NICE: Eating Disorders⁷ have all noted a lack of RCTs to support evidence based guidelines for AN per se.

Only two dietary counselling RCTs have been highlighted in the literature^{12, 13} and have been discussed above. There was minimal relevant evidence to all clinical questions. The literature search generated 947 articles. After exclusion criteria, only 4 were referenced in the recommendations^{3, 16, 17, 18}. Two did not answer any clinical questions but substantiated gastric delay and debated the validity of supplementary nutrition drinks in treating AN¹⁶. One article was of interest, as the position paper of the ADA³; the paper was referenced as Expert Opinion. The fourth paper supported zinc supplementation for weight gain in AN¹⁷.

Table 4: Summary of papers reviewed for evidence in nutritional management of AN

Study details	Participant details	Summary of research methods	Study outcomes
Zipfel et al 2006 ¹⁸	Review of the literature on the gastrointestinal disturbances in eating disorders	Review of observations	Patients with AN experience substantial delays in gastric emptying as well as constipation

Imbierowicz et al 2002 ¹⁶	58 inpatients of specialist ED clinics in Germany, 29 each from 2 different clinics. Patient BMIs were between 14 and 16. No difference between matching variables of the patients.	A retrospective study. One group received 3 bottled high energy supplements a day (6,300kj) in addition to 3 meals a day and optional snacks. The other group had no supplements; they were encouraged to increase their food intake.	Patients receiving supplements had significantly greater weight gain and rate of weight gain, but no significant difference in BMI at catamnesis.
ADA ³	Review of epidemiology, presentation and treatment of eating disorders.	Not a research paper.	The position of the ADA is that nutrition intervention is by a registered dietitian. The dietitian needs to understand the complexities of the illness and be part of the collaborative, multidisciplinary team of psychological, nutritional and medical specialists. More research is required to improve treatment outcomes.
Birmingham et al 1994 ¹⁷	35 female patients admitted to the eating disorder wards of 2 university teaching hospitals in Canada.	16 patients were randomised to a zinc-supplemented group, 19 randomised to a placebo group. Supplementation was discontinued when a 10% weight gain above baseline was achieved on two consecutive bi-weekly weigh-ins.	Only 19 patients completed the trial, 6 in the zinc-supplemented group, and 10 in the placebo group. The rate of increase in BMI of the zinc-supplemented group was twice that of the placebo group. This was statistically significant.

Expert judgment based on consensus of nutrition management was collated using standard questionnaires with dietitians specialising in the treatment of eating disorders (see Table 3).

The level of evidence was mainly Expert Opinion and has been referenced appropriately in the document. Expert Opinion was derived by a Delphi process. Questionnaires were given to reviewers to develop consensus-based recommendations, when evidence was unavailable. When comments were made, changes were incorporated into the document. Using a Delphi process and pilot testing, statements were refined and total agreement achieved with expert opinion for the final draft.

NHMRC do not ascribe an evidence level to expert opinion.

General Practice Recommendations

The intention was to develop evidence based practice guidelines for the nutritional management of adults with anorexia nervosa. No levels of evidence (NHMRC 1999, 2005)^{1,2} could be assigned to any of the clinical questions, due to the lack of suitable research studies. The authors have therefore developed Practice Recommendations, based on consensus of expert opinion.

Summary of Practice Recommendations

1 Nutrition Assessment

Clinical question: *Which specific measures best reflect nutritional status, abnormal eating behaviours and abnormal attitudes in patients with anorexia nervosa?*

Practice recommendation 1a

Minimum biochemical data required for assessment includes haematology, phosphate, potassium and magnesium (taking into consideration the hydration status of the patient)¹⁹

Practice recommendation 1b

A detailed nutritional assessment and diet history should be taken to identify BMI, weight history, abnormal eating behaviours, attitude to weight loss, and the relationships between the patient's emotions and food.

2 Nutritional Diagnosis

Clinical question: *What are the defining diagnostic characteristics that describe the nutritional status, abnormal eating behaviours and abnormal attitudes in adult anorexia nervosa patients?*

Practice recommendation 2a

A patient with AN has a BMI of 17.5 or less. Their weight loss is self-induced by under-eating and avoiding "fattening foods", with or without one or more of the following: self-induced vomiting; self-induced purging; excessive exercise; use of appetite suppressants, and/or diuretics. There is a dread of fatness which persists as an intrusive, overvalued idea and the patient imposes a low weight threshold on himself or herself^{20,21}.

Practice recommendation 2b

Abnormally low levels of magnesium, phosphate and potassium, with normal hydration, can indicate an acute state of malnutrition²²⁻³¹.

3 Dietetic intervention

Clinical question: *What are the requirements of the dietitian treating anorexia nervosa in adults?*

Practice recommendation 3a

Advanced training and a mentor or clinical supervision is preferable for any dietitian treating this condition^{3,8}.

Practice recommendation 3b

The dietitian should not work as the sole therapist in treating AN^{3,4,7,8}.

Clinical question: *What are the appropriate nutritional interventions to optimise nutritional status?*

Practice recommendation 3c

Appropriate interventions are restoration of body weight to a normal range (BMI 19 – 25 ± 2kgs), normal body composition, normal range biochemistry and medical status by increasing energy intake from a nutritionally balanced intake³².

A low level of blood glucose < 3.0mmol/l, potassium <3.5mmol/l, phosphate <0.8mmol/l and sodium <125mmol/l, with appropriate hydration, are critical and need immediate intervention. Thiamine, zinc, calcium and iron status need to be monitored^{3,4,8,32,33}.

Practice recommendation 3d

All equations for estimating energy requirements are inaccurate when calculated for individuals with AN. Most overestimate requirements^{34,35} in the acute phase of re-feeding, energy requirements then increase disproportionately during the course of re-feeding^{34, 36-40}.

Adjust energy intake gradually beyond homeostasis to achieve regular weight increments, depending on risk of re-feeding syndrome^{3,7}.

Clinical question: *What are the ways that dietitians can help patients achieve normal eating behaviour and normal attitudes to food?*

Practice recommendation 3e

Nutritional interventions should include education about the medical, physical and psychological consequences of excessive dieting and weight loss behaviours, weight gain, changes to metabolism and culturally appropriate eating behaviour^{8, 41}.

4 Monitoring and Evaluation

Clinical question: *What are the outcomes to be monitored and evaluated to determine the progress of nutritional care in adult patients with anorexia nervosa?*

Practice recommendation 4a

Regular monitoring of weight, aiming for a weight gain of 0.25–1.5kg/week after establishing medical stabilisation^{3,7,41}.

Practice recommendation 4b

Regular monitoring of potassium, magnesium, phosphate, glucose, thiamine, zinc and hydration, to assess risk of development of the re-feeding syndrome²²⁻³¹.

Appendix 1: Background to Practice Recommendations and Practice Tips

1 Nutrition Assessment

A detailed assessment of dietary intake, biochemistry, weight history, endocrine history, anthropometry, family food beliefs, abnormal food behaviour and brief life history will provide information about nutritional status and identify associations between emotional issues and eating (consensus from DAA ED workshops 2006/7, see Appendix 2).

From the patient assessment, different treatment settings need to be considered according to the severity of the illness and the patient's motivation and medical insurance.

Treatment options

Outpatient

Acute and chronic patients who are medically stable, motivated to change and willing to make progress with weight change are seen in an outpatient setting. NICE guidelines⁷ note most patients should be treated as outpatients.

Day-patient

Patients suitable for referral to a day programme may have been former inpatients or outpatients. These patients should not be medically unstable and fit the specific programme's admission criteria⁴².

Inpatient treatment

These patients are usually medically and psychologically compromised and unable to control weight loss^{7,8}. They can present with variable motivation, but usually poor; these patients are in need of admission to a specialised unit for medical stabilisation and weight gain.

Clinical question and recommendations

Which specific measures best reflect nutritional status, abnormal eating behaviours and abnormal attitudes in patients with anorexia nervosa?

Practice recommendation 1a

Minimum biochemical data required for assessment include haematology, phosphate, potassium and magnesium (taking into consideration the hydration status of the patient)¹⁹.

Practice recommendation 1b

A detailed nutritional assessment and diet history should be taken to identify BMI, weight history, abnormal eating behaviours, attitude to weight loss, and the relationships between the patient's emotions and food.

Practice tips

- Assessment may take place over a number of sessions
- Individuals with AN may overestimate their energy intake³

- Referrals can come from various sources: medical practitioners; psychologists; counselors; teachers; parents or self-referrals. For best practice the referral would be received prior to the first consult, no later than the second consult
- Referral should be based on the diagnostic criteria (see Appendix 3). The referral should include information about age, diagnosis, recent weight change, biochemistry, BMI and GP contact details
- A medical consultation to assess medical stability is recommended prior to the first appointment with the dietitian

2 Nutrition Diagnosis

There are 2 classification systems in use world-wide to diagnose AN:

- The diagnostic criteria of the International Classification of Diseases, Tenth Edition (ICD -10) for anorexia nervosa²⁰
- Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM IV), Text Revision; 2000; American Psychiatric Association²¹ (See Appendix 3)

The diagnosis of AN can be complex because of the variable severity of the disorder, the medical status, co-morbid illness and additional psychiatric diagnoses (axis I: depression, chemical dependency, anxiety, body dysmorphic disorder, and axis II: personality disorders)³.

The nutritional diagnosis (including BMI, rate of weight loss, biochemistry, clinical observation and overall nutrient intake) forms part of the psychiatric diagnosis. With normal hydration, low levels of magnesium, phosphate and potassium can indicate acute starvation (see Table 4).

Table 5: Biochemical measurements for diagnosis¹⁹

BIOCHEMISTRY	ASSESSMENT ISSUES
Urea	Elevated urea levels can be a sign of dehydration or catabolism of muscle. Dehydration will confound or distort all other blood levels
Iron Studies i.e. B12, red blood cell folate and serum ferritin	Elevated urea or dehydration will confound results
Blood sugar levels	Early morning asymptomatic hypoglycaemia with ketonuria ³² needs to be anticipated and managed. An early morning BSL would be desirable. Repeat if low. Monitor BSL as part of standard tests on weekly basis for inpatients. Rich et al ³³ noted seven cases of severe hypoglycaemia and death were cited in the literature.
Potassium	Monitor potassium regularly as an outpatient and in-patient. Low potassium can indicate: 1) Purging 2) A re-feeding problem where urgent medical attention is required Elevated levels can indicate kidney dysfunction. Potassium less than 2.5mmol/l is severe, less than 2.0mmol/l is critical and will require urgent medical treatment. Chronic

	deficiency at whole normal body level may not be reflected by serum values.
Magnesium	<p>Low serum magnesium always indicates magnesium deficiency; normal serum magnesium does not exclude deficiency.</p> <p>Birmingham et al³⁷ found that hypomagnesemia could occur as late as the third week of re-feeding. Sixty per cent of the anorexic population studied presented with low serum magnesium during the admission.</p> <p>General protein energy malnutrition, endurance runners, persons abusing laxatives or diuretics, or those who engage in vomiting are all likely to have increased risk of magnesium deficiency.</p> <p>Low magnesium can be an indicator of the re-feeding syndrome. A magnesium load test is required if the test magnesium serum is normal and symptoms of muscle cramping, muscle fatigue, fatigue of focus of the eye or impaired memory are present.</p> <p>Monitor regularly for abnormal levels.</p>
Phosphate	<p>Low phosphate can be an indicator of potential re-feeding problems. Hypophosphataemia is a risk factor for sudden death. Phosphate levels can decrease upon re-feeding in severely malnourished persons This can occur very rapidly so levels ideally should be measured daily for the first fortnight of re-feeding with inpatients with BMIs less than 14 or rapid weight loss (approx 1kg/ week over a 3 month period with a diagnosis of AN) Carney et al⁴³.</p> <p>A reading less than 0.32mm is extremely critical, medical intervention prior to this point is required.</p> <p>It is of note that the re-feeding syndrome can occur with oral intake in an outpatient setting³⁰.</p>
Sodium	<p>Low sodium may mean fluid overload.</p> <p>Mild – 125mm to bottom of normal range</p> <p>Severe - <125mm.</p>
Pre-albumin	<p>Pre-albumin levels taken on assessment will reflect adequacy of nutrient intake. <110mg/l can be an indicator of developing the re-feeding syndrome²⁸.</p>
Thiamine	<p>Awareness of low thiamine and Wernicke's Encephalopathy is important. This is most likely to manifest during re-feeding especially with high carbohydrate intake. Wet Beri Beri is also a possible consequence of low thiamine.</p> <p>Thiamin requires magnesium and phosphate to function in humans, as such correct magnesium and phosphate deficiencies with thiamin supplementation.</p>
Cholesterol	<p>Elevated levels are relatively common and do not need dietary restrictions. Cholesterol levels resolve with weight gain in anorexia nervosa.</p>
Zinc	<p>Low zinc status can lead to</p> <ol style="list-style-type: none"> 1) Decreased taste receptors and taste sensitivity 2) Thinning of hair 3) Dry skin <p>If red meat is excluded from the diet, zinc intake is likely to be below the RDI.</p>

Calcium	Low calcium can solely reflect a low blood albumin and does not need to be treated. Low ionized calcium is usually due to total body magnesium deficiency, as such treat the coexisting hypomagnesaemia.
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Table 6: Other medical parameters for diagnosis¹⁹

MEDICAL PARAMETER	ASSESSMENT ISSUES
Blood pressure	Low blood pressure can indicate dehydration and will need urgent medical attention.
Congestive heart failure	Reduced ventricular mass and increased cardiovascular volume when re-feeding can lead to congestive heart failure.
QTc interval	A prolonged QTc interval can be an indicator of developing the re-feeding syndrome.
Bone density	Prolonged anorexia nervosa can lead to osteoporosis, as a result of low weight, reduced hormone levels and inadequate calcium intake. <u>Mild:</u> (osteopaenia) is T score <-1 <u>Severe:</u> (osteoporosis) T score <-2.5

Clinical question and recommendations

What are the defining diagnostic characteristics that describe the nutritional status, abnormal eating behaviours and abnormal attitudes in adult anorexia nervosa patients?

Practice recommendation 2a

A patient with AN has a BMI of 17.5 or less. Their weight loss is self-induced by under-eating and avoiding “fattening foods”, with or without one or more of the following: self-induced vomiting; self-induced purging; excessive exercise; use of appetite suppressants, and/or diuretics. There is a dread of fatness which persists as an intrusive, overvalued idea and the patient imposes a low weight threshold on himself or herself^{20,21}.

Practice recommendation 2b

Abnormally low levels of magnesium, phosphate and potassium, with normal hydration, can indicate an acute state of malnutrition²²⁻³¹.

Practice tips:

- The Keys et al study⁴⁴ demonstrates significant physical and psychological consequences of starvation, irrespective of the presence of AN (see Appendix 4).
- Nutritional intervention before full diagnostic criteria are reached is preferable, to help prevent behaviours becoming entrenched

3 Nutrition Intervention

In this section, recommended interventions are referenced wherever they are available. Where there are no references available, recommendations are derived from consultation and expert opinion.

Dietitians as sole therapists in outpatient treatment of AN

The dietitian should not be the sole therapist in treating AN because of the complex psychological and medical nature of the illness^{3,5,7,8}. Successful dietetic intervention that removes the patient's usual coping strategy (food restriction) might trigger underlying psychological issues and lead to further deterioration in mood. However, a dietitian can be the first health professional to whom a person with AN is referred. Dietitians can play an important role in recommending and facilitating referral to other health professionals and working in collaboration with them. Dietitians should also ensure that patients referred to them keep in regular contact with a medical practitioner and a mental health professional^{3,8}.

The team approach

It is recommended that patients with AN are treated by a multidisciplinary team of professionals from medical, nutritional and mental health disciplines^{3,5,7,8}. Dietetic intervention is integral to the team treating anorexia nervosa⁷.

The specialist clinical dietitian, as part of the team, is the most appropriately qualified person to provide accurate education about nutrition, weight gain, weight maintenance, and the resumption of normal eating. The dietitian is also able to assess the risk of re-feeding syndrome and advice on subsequent dietary prescription. Ideally, the dietitian has continuous contact with the patient during the course of treatment^{3,8}.

Appropriate training for dietitians treating anorexia nervosa

Dietitians treating anorexia nervosa need to understand the illness complexities, such as co-morbid illness, medical and psychological consequences of starvation and boundary issues⁶. Working with this population therefore requires advanced level skills, which can be achieved with either mentoring or clinical supervision (by an experienced psychotherapist or dietitian), continued education course attendance and self-study^{3,8}.

Psychological issues and treatment boundaries

Psychological considerations in nutritional intervention are of central importance from the very first meeting with the anorexic patient. Restrictive eating may be a way of coping with life stressors or be a reflection of poor self-esteem⁴⁵.

Engaging the patient

Engaging with the patient and developing a good rapport from the initial consultation will facilitate trust, openness and co-operation in the therapeutic relationship^{1,6}. Trust, rapport, respectful interactions, hope, an equal collaborative relationship, humour, warmth and self-responsibility are all effective tools to engage patients^{45, 46}.

Psychological tools for dietetic intervention

CBT can be an effective technique for the dietitian to utilize^{3,8}.

Motivational interviewing skills are effective when engaging the patient and determining how the patient perceives the problem. Hearing the patient's story will help define the fundamental problems^{3,45,47}. Five important principles in trying to motivate the unmotivated patient are: express empathy; develop discrepancy; avoid arguments; roll with resistance and support self-efficacy⁴⁸.

Anthropometric, biochemical and medical intervention

Decisions about biochemical and medical interventions will be made in conjunction with a medical practitioner. The following table indicates appropriate measures to be taken.

Table 7: Anthropometric, biochemical and medical intervention¹⁹

PARAMETER	INTERVENTION
Weight	Intervention – restore to appropriate BMI level
Urea	If dehydrated, promote adequate daily fluid intake to at least 2.1L for females and 2.8L for males ³² . Use intra-venous saline drip if the patient is unable to drink sufficient fluids. Intravenous (IV) dextrose is contra-indicated.
Iron Studies (B12, red blood cells, folate and serum ferritin)	If low, supplementation with iron, B12 and folate; take dietary measures to increase intake from appropriate foods and to maximise absorption.
Blood sugar levels	Hypoglycaemia can occur during re-feeding, with insulin production stimulated and insufficient carbohydrate stored in the liver to maintain a safe blood glucose level. A regular carbohydrate intake and balanced diet during the day is essential to prevent hypoglycaemia. An evening carbohydrate and protein snack will prevent early morning asymptomatic hypoglycaemia with ketonuria ⁴⁹ . If the patient is hypoglycaemic (i.e. blood glucose less than 2.5 mmol/l) consider administering thiamine, phosphate and a continuous dextrose drip if the patient is unable to eat ¹⁹ .
Potassium	Low potassium levels require supplementation with potassium, medical monitoring and cessation of purging behaviours (see risk of Re-feeding Syndrome).
Magnesium	Low magnesium levels require supplementation with oral, intramuscular or IV magnesium and medical monitoring. Oral supplements are poorly absorbed when presenting as magnesium deficient. Oral magnesium supplementation can cause diarrhoea and should be decreased if it does. Magnesium less than 0.6mmol/l is severe and requires urgent, usually IV attention ¹⁹ (see Re-feeding Syndrome).
Phosphate	Assess for the risk of the re-feeding syndrome (see re-feeding syndrome). Consider administering prophylactic phosphate before re-feeding. With severely low phosphate levels (0.32mmol/l) consider IV phosphate and reducing or ceasing total enteral feeding to facilitate containment of phosphate levels, until biochemistry returns to normal. Continue oral phosphate

	supplementation until biochemistry and eating is consistently adequate ¹⁹ .
Sodium	Low sodium may require fluid restriction or sodium supplementation ¹⁹
Pre-albumin	A low pre-albumin reflects sub optimal nutrient intake. Nutrient intake will need to be increased ²⁸ .
Thiamine	Thiamine deficiency is most likely to manifest during re-feeding especially with high carbohydrate intake. Thiamine requires magnesium and phosphate to function, hence correct magnesium and phosphate deficiencies with thiamin supplementation. Supplement with multivitamins and promote thiamin-rich foods. If at risk of the re-feeding syndrome supplement with 100mg thiamin a day for the first 5 days. Avoid dextrose drips ¹⁹ .
Cholesterol	Elevated levels are relatively common following extreme weight loss and do not need dietary restrictions. Cholesterol levels resolve with weight gain in anorexia nervosa ¹⁹ .
Zinc	Birmingham et al ¹⁷ , RANZCP guidelines ⁵ , support zinc supplementation.
Bone mineral density	Promote weight gain to a normal range as the optimal strategy for bone density improvement ⁵⁰ so: 1) Aim for dietary calcium to reach 1,500mg/d ^{49, 51} . 2) Consider calcium and Vitamin D supplement. 3) Bone density scans recommended for patients with illness longer than one year. 4) Endocrine review is essential for all anorexia nervosa patients.

Normalisation of food intake

Patients should be encouraged to eat a balanced, wide variety of foods⁵² within regular meals and snacks, appropriate for their home and social environment.

Most Australian dietitians working in eating disorders aim to meet patients' nutritional requirements by oral food and liquids, without artificial feeding^{3, 41}.

Normalisation of fluid intake

Some patients may restrict their fluid intake while others may drink excessively⁵³. Both behaviours have potentially serious medical consequences. Assessment of daily fluid intake is essential, as well as utilising guidelines for normal fluid consumption³².

Oral supplementation and naso-gastric (NG) feeding

ADA position paper^{3,8} supports using normal food in the diet rather than parenteral or enteral feeding. RANZCP guidelines⁵ note lack of evidence to support any specific approach for achieving weight gain.

High-energy supplements used in the treatment of AN result in significantly higher weekly weight gains and higher BMI on discharge, but no significant difference in weight at 2.5 years follow-up¹⁶.

If patients cannot cope with adequate oral intake and are medically at risk, NG feeding may need to be considered⁵⁴. The Guardianship Board or the Mental Health Act will be required to permit NG feeding for severely medically compromised patients not consenting to treatment⁴³.

Total Parenteral Nutrition (TPN) should not be used, unless there is significant gastrointestinal (GI) dysfunction⁷.

Energy requirements for weight gain

Medical stabilisation of the patient must be established before weight gain³⁶. The Harris-Benedict equation is inaccurate for the early weeks of re-feeding to predict BMR in the acute phase of AN^{34, 35}, overestimating energy requirements.

Energy intake should therefore be determined by the individual patients' rate of weight gain, with the daily energy intake being gradually increased to prevent oedema, congestive heart disease and the re-feeding syndrome²⁸. Ideally energy intake should not go below 5040kJ/day but it can be reasonable to start below the ideal and gradually increase kilojoules each week to the preferred level⁵⁵. Initially energy requirements will be low and will increase disproportionately during the course of re-feeding^{34, 36-40}. Once reaching target weight, resting metabolic rate (RMR) returns to that expected of a normal population³⁷. A history of bulimic symptoms and a higher pre-morbid weight usually result in lower kilojoule requirements for weight gain³⁶. The NICE guidelines⁷ suggest 14,700-29,400 extra kilojoules per week to gain 1kg/week. ADA 2006³ position paper proposes gradual adjustments in nutrient intake and weight progress, such as stepping up energy intake from a baseline level between 125-170 kJ/kg/day to achieve weight gain of 0.25-0.50kg per week.

The majority of Australian dietitians working in eating disorders recommend "variable energy levels depending on the patient"⁴¹.

Protein and fat requirements

Protein and fat requirements are at the same level as recommended for the general population³².

Calculating normal body weight

Most clients will present wanting to lose further weight or to maintain a weight too low for their height. In order to ascertain where the patient's normal weight range lies, it is important to consider the difference between the patient's minimum healthy weight that is necessary for normal bodily function, and their genetically determined "set point" weight⁴⁴. Some specialist units consider that restoration of minimum healthy weight is an adequate definition of recovery whereas others encourage patients to return to their pre-morbid set point weight, taking into account stage of development (see practice tips).

In females, one measure of minimum healthy weight is the weight at which normal menstrual cycles resume and are maintained⁵⁶, although some patients do not lose their periods even at very low weights, and others do not regain their periods at previously normal weights. Bone health is another indicator of healthy weight; Gross

et al (2003)⁵⁷ promoted an initial target BMI of 19 for healthy bone status (refer to practice tips for setting initial weight and target weight goals).

Nutrition education

The most common topics used by at least 50% of Australian dietitians who use group education sessions for treating eating disorders are: general nutrition and core food groups; menu planning; gut function; consequences of restriction and dieting; dietary iron requirements; calcium requirements and osteoporosis; metabolism and energy requirements; consequences of binge eating and vomiting; food outings and social eating; the binge eating cycle; shopping skills; cooking skills; family meal plans; strategies for preventing relapse⁴¹.

Relevant evidence based information for the dietitian to know and discuss with the patient includes the following:

GI discomfort

Patients with anorexia nervosa usually experience delayed gastric emptying and slower peristalsis^{7,18,58,59}.

Constipation and laxative abuse

Patients with AN are often constipated from malnutrition^{7,18,60}. GI symptoms improve significantly with re-feeding, specific investigations needed only for patients with independent indicators of digestive disease or who are not gaining weight⁵⁹. Vantini et al⁶⁰ found colonic transit time normalised after a 4-week re-feeding programme, although pelvic floor dysfunction did not normalise.

Many patients abuse laxatives, erroneously believing that laxatives promote weight loss. Laxative abuse causes loss of bowel muscle tone; cessation of laxatives therefore results in constipation. Chronic laxative abuse may lead to faecal impaction, so a stepped program of laxative reduction is advisable.

Bulimic episodes or binge eating

Major triggers for binge eating are food restriction and avoidance of feared foods, as well as stress. Eating regular meals and snacks, and having a variety of foods which include the patient's feared foods, should help to prevent binge eating¹⁵.

Exercise

40-80% of patients will engage in excessive activity, as well as food restriction, to lose weight. Formalised exercise, as well as incidental activities, should both be considered and evaluated. Some guidelines and limits should be provided since hyperactivity can obstruct weight gain⁶¹.

Clinical questions and recommendations

What are the requirements of the dietitian treating anorexia nervosa in adults?

Practice recommendation 3a

Advanced training and a mentor or clinical supervision is preferable for any dietitian treating this condition^{3,8}.

Practice recommendation 3b

The dietitian should not work as the sole therapist in treating anorexia nervosa^{3,5,8}.

What are the appropriate nutritional interventions to optimise nutritional status?

Practice recommendation 3c

Appropriate interventions are restoration of body weight to a normal range (BMI 19 – 25 ± 2kgs), normal body composition, normal range biochemistry and medical status by increasing energy intake from a nutritionally balanced intake³².

A low level of blood glucose < 3.0mmol/l, potassium <3.5mmol/l, phosphate <0.8mmol/l and sodium <125mmol/l, with appropriate hydration, are critical and need immediate intervention. Thiamine, zinc, calcium and iron status need to be monitored^{3,5,8,32,33}.

Practice recommendation 3d

All equations for estimating energy requirements are inaccurate when calculated for individuals with AN. Most overestimate requirements^{34,35} in the acute phase of re-feeding, energy requirements then increase disproportionately during the course of re-feeding^{34,36,37-40}.

Adjust energy intake gradually beyond homeostasis to achieve regular weight increments, depending on risk of re-feeding syndrome^{3,7}.

What are the ways that dietitians can help patients achieve normal eating behaviour and normal attitudes to food?

Practice recommendation 3e

Nutritional interventions should include education about: the medical, physical and psychological consequences of excessive dieting and weight loss behaviours; weight gain; changes to metabolism, and culturally appropriate eating behaviour^{8,41}.

Practice tips:

- *Boundaries*

There will inevitably be some overlap between nutritional, medical and psychological issues in therapy sessions, and the dietitian should be aware of these inter-relationships. The connections between emotions, such as anxiety or anger, and disordered eating, are not always apparent to the patient. One way in which the dietitian can highlight these connections and help patients accept the need for psychological counseling is with the use of food diaries. Patients are encouraged to keep a record of their food intake and concurrent thoughts, feelings and emotions.

It is essential that regular communication occurs between other therapists and the dietitian to ensure a consistent approach.

- *Collaborative and facilitated goals*

Collaboration between the dietitian and patient when setting goals is recommended. However, dietetic decisions may need to be taken and implemented without the full agreement of inpatients. By virtue of their need for hospitalisation, inpatients are usually more seriously medically compromised, and more poorly motivated than outpatients.

- *Feared foods*

Diet foods should be discouraged and feared foods included in the meal plan. In order to reduce or manage patient anxiety, it can be helpful to work out a hierarchy of feared foods with the patient as a way of incrementally incorporating these into their normal eating pattern.

- *Normalisation of food intake*

In the home environment, encourage eating regular meals together as a family, with the patient eating the same meals as the rest of the household. Family members, or an agreed “buddy”, can be supportive by reminding the patient to eat snacks and sitting with them at meal and snack times. Meals should be time-limited, times varying according to the context. Time spent talking about food should also be limited, particularly at meal times.

Suggest supermarket trips should be time-limited or not attended by the patient, and that reduced-energy diet foods are not appropriate purchases. If other family members use them, non-diet products must also be readily available. A specific meal plan, provided by the dietitian, is usually recommended.

- *Energy requirements*

The new dietitian working in the field may wish to use a standardised equation upon which to base their food plans. However, these equations have limitations in AN. The calculation of an adequate energy intake for re-feeding is difficult because of disturbed patient behaviours, such as hiding food, purging and water loading. Food diaries, regular weighing and monitoring blood biochemistry will assist the dietitian in the construction of an appropriate dietary regimen.

- *Weight goals*

A definition of normal weight would be that which is maintained with a nutritionally adequate food intake, and which is culturally and socially appropriate for the patient’s age and lifestyle. Normal weight should be maintained with a food intake that is in line with the patient’s experiences of hunger and fullness and without the need for continued dieting and kilojoule counting. This will usually be within the BMI range 20-25 for adults, and higher than a BMI 20 for most individuals. However, interim weight goals may be appropriate in the short term. Lower weight goals may need to be set for chronically ill patients who have limited capacity for change.

- *Inpatient treatment*

RANZCP (2004)⁵ guidelines promote ‘supported meals’ in inpatient treatment programmes. The most common way of supervising meals in Australian specialist units is to have a group of eating disordered patients eat together, supervised by a health professional⁴¹, who ideally eats with the patients as a role model. It is recommended (DAA workshop group consensus 2005) that dietitians prescribe a meal plan providing three balanced, non-“diet” hospital main meals daily and two to three between-meal snacks. Patients are normally allowed a limited number of “dislikes”, which need substantiation as being avoided prior to the development of the eating disorder. There are usually rules around length of time for eating meals, appropriate conversation at the table and acceptable eating behaviours, with abnormal behaviours corrected by nursing staff. Patients are usually asked to complete an appropriate exchange of a liquid nutritional supplement if the meal is not completed.

- *Education*

Gastro-intestinal changes

Initially, small frequent meals allow the stomach to expand gradually, thus avoiding excessive abdominal pain. As re-feeding progresses, gastric motility should return to normal.

- *Constipation*

A well balanced diet that contains plenty of fluids and sufficient quantities of dietary fibre will help to reduce constipation. Peristalsis may be slow and if laxatives have been used regularly as a form of weight control, it may take many days or even weeks for the previously over-stimulated bowel to respond to normal quantities of dietary fibre. The bowel will usually return to normal functioning.

- *Exercise*

Medical assessment is essential before setting recommendations for exercise. Some patients will need to cease all activity until their medical condition improves.

Planned exercise during treatment should always be moderate, preferably social rather than solitary, and dependant upon the patient eating and drinking adequately. Access to an exercise therapist experienced in advising people with anorexia nervosa is invaluable.

4 Monitoring and Evaluation

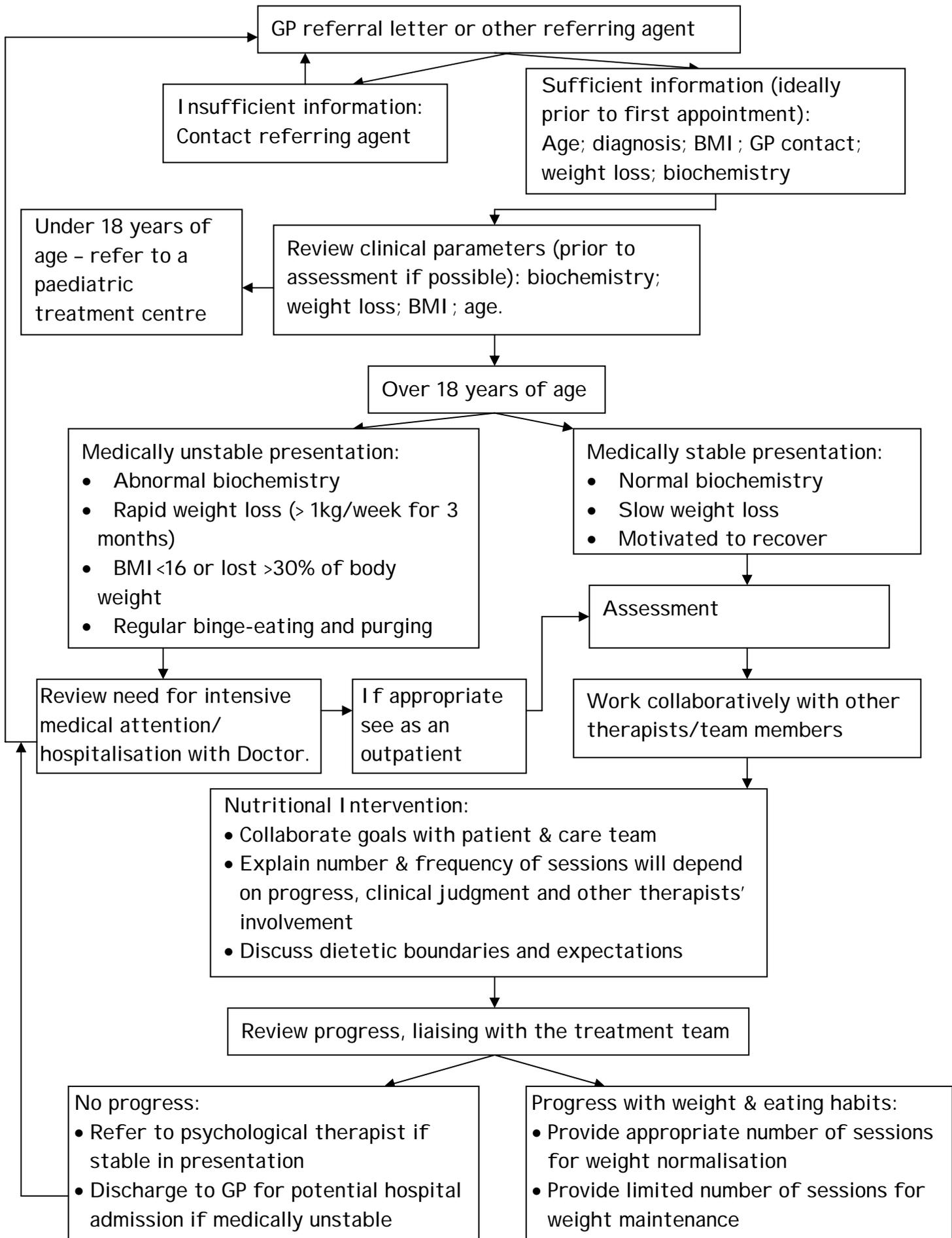
Format of dietetic consultation

The format of the dietetic consultation should include: monitoring of daily food consumption to assess adequacy of nutritional and energy intake; assessment of the cultural appropriateness of eating pattern; monitoring of binge eating and purging behaviour (excessive exercise, vomiting, laxative abuse), (consensus of opinion, IG group). The rate of progress to ultimate recovery will depend on patient motivation. Continued dietetic sessions depend on continued progress. See flow diagrams.

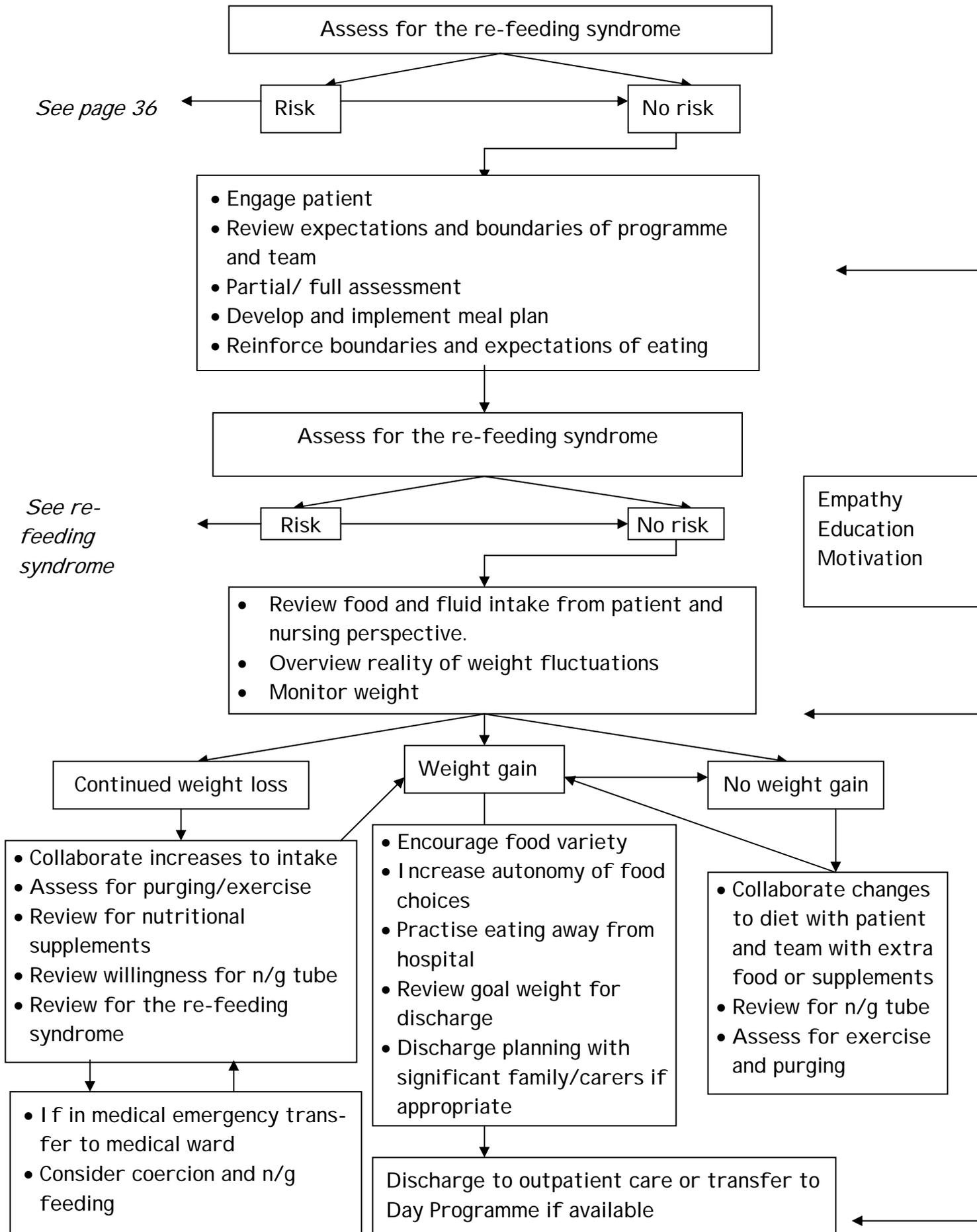
Flow charts of treatment management:

Consensus from DAA ED workshops 2006/7

OUTPATIENT MANAGEMENT FLOWCHART



INPATIENT MANAGEMENT FLOWCHART



Monitoring of weight

Patients should be weighed at each visit in an outpatient setting, and twice weekly weighing is sufficient for inpatients⁵. NICE guidelines⁷ (expert opinion) recommend aiming for an average weekly weight gain of 0.5kg–1kg for inpatients and 0.5kg for outpatients. ADA (2001)⁸ position paper expects 0.5kg–1.0kg weight gain for outpatients and 1.0kg–1.5kg weight gain for inpatients. ADA 2006³ position paper suggests 0.25-0.5kg per week. Hart et al⁴¹ found that weight gains between 0.25 -1.5kg per week are recommended by Australian dietitians.

Once normal weight is achieved, a maintenance weight range of approximately 2kg is recommended because of day-to-day variations in body composition⁶². Patients invariably require ongoing guidance and support from psychological counselors and dietitians for successful weight maintenance and recovery.

The Re-feeding Syndrome

When re-feeding patients with malnutrition, there is a significant risk of development of the re-feeding syndrome, which can be fatal. Predisposing factors include recent rapid weight loss with a low BMI (usually 14 or less), low serum phosphate, magnesium, potassium, glucose and zinc, and high serum urea levels⁴³. Patients should be monitored and treated in an inpatient setting¹⁹. At-risk patients should be prescribed a multivitamin and prophylactic thiamine, phosphate, magnesium, zinc and potassium. Any abnormalities should be corrected immediately prior to and during re-feeding²²⁻²⁹ using IV solutions if unable to correct with oral intake, or to an adequate level in the blood. Reintroduce food, by mouth or NG tube, cautiously^{22,27,29}. Mehler²⁷ suggests starting enteral feeding at 2520kJ-3360kJ per day in high-risk patients and increasing intake by 1260kJ every third day. Stroud et al⁶³ recommends 45 kJ/kg/24h. If the re-feeding syndrome occurs, reduce the feed or nutrient intake (NG or oral) to a previously safer level or stop feeding^{25,29}.

All the above is based on expert opinion, not evidence based. The overall message is caution.

The treatment of anorexia nervosa and legal issues

The use of coercive measures to try to enforce re-feeding of AN patients is usually limited to life threatening scenarios: developing the re-feeding syndrome; developing medical complications of AN (for example cardiac failure); uncontrollable weight loss at a low BMI⁴³. Feeding against the will of the patient should be an intervention of last resort in the care and management of AN⁷ (expert opinion). We endorse the NICE guidelines⁷ that feeding against the will of the patient is a highly specialised procedure requiring expertise in the care and management of those with severe eating disorders, and the physical complications associated with it. This should only be done in the context of the Mental Health Act or Guardianship Act. When making the decision to feed against the will of the patient, the legal basis for any such action must be clear.

Neither Guardianship nor the Mental Health Act can enforce any treatment beyond acute medical recovery. Both laws can only be used to physically and medically stabilise the patient⁵⁴.

Clinical question and recommendations

What are the outcomes to be monitored and evaluated to determine the progress of nutritional care in adult patients with anorexia nervosa?

Practice recommendation 4a

Regular monitoring of weight, aiming for a weight gain of 0.25kg–1.5kg/week, after establishing medical stabilisation^{3,7, 41}.

Practice recommendation 4b

Regular monitoring of potassium, magnesium, phosphate, glucose, thiamine, zinc and hydration, to assess risk of development of the re-feeding syndrome²²⁻³¹.

Practice tips:

- The initial assessment will be a long consultation of usually one hour. Follow up consultations are usually 30–60 minutes in duration. Weekly sessions are recommended at the commencement of nutritional intervention. As the patient progresses and becomes more confident with regular eating and weight gain, sessions may be less frequent.
- The format of the dietetic consultation should include: monitoring of daily food consumption to assess adequacy of nutritional and energy intake; assessment of the cultural appropriateness of eating pattern; monitoring of binge eating and purging behaviour (excessive exercise, vomiting, laxative abuse).
- The weigh-in should only be taken by one member of the team eg doctor/ dietitian/ nursing staff, on the same scales at a consistent time of day and then communicated to the rest of the team. Discourage patients from weighing themselves at home as they can be misled and unnecessarily distressed by day-to-day fluctuations. Once normal weight has been established and for chronic case presentation, intermittent weighing is more appropriate
- Assess weight changes in the context of recent food and fluid intake, biochemistry and clinical presentation, to ensure weight change is justified. Weight may rise sharply, possibly by as much as 1-2kg, at the beginning of re-feeding due to re-hydration, increased glycogen storage, fluid electrolyte shifts and increased contents of the digestive tract. Unexpectedly high weight gains may also be indicative of oedema, binge eating or falsification of weight.
- Patients may choose to not know their exact weight.
- Treatment refusal and patients at medical risk should be referred back to the treating doctor

IMPLEMENTATION AND EVALUATION OF RECOMMENDATIONS

Implementation plan

The recommendations will be made available to dietitians through the DAA website. They will also be available, on application, from the main authors.

Supporting material

Finalisation of supporting material is in progress and will be available on DINER on the DAA website once resources are endorsed. Material is currently available through the DAA EDIG webpage.

Evaluation plan

To be evaluated and updated in 2012, or before if there are significant changes to the nutritional management of AN in adults.

Recommendations for research

Evidenced based research is needed for improved treatment outcomes, along with identification of effective primary and secondary interventions³.

Much research is required in order to make evidence based recommendations. Suggested areas of research could include:

- An assessment tool to rate degree of nutritional and behavioural abnormalities in AN, and to link degree of severity with appropriate intervention.
- Best practice for delivering nutritional management of AN, to achieve optimal outcomes for weight gain, changes in eating attitudes, and normalisation of eating behaviours.
- Accurate assessment for risk of re-feeding syndrome, in order to better guide prescription of preventative measures.
- The optimal rate of weight gain for recovery.
- Appropriate training for dietitians to competently manage AN.

Nutrition research is confounded by the overlap with psychological and medical interventions. This can make data difficult to extrapolate and interpret.

Appendix 2: Assessment details

Table 8: Dietary History and Nutritional Assessment
(Consensus from DAA ED workshops 2006/7)

Attitude	* Client's aims for treatment and motivation to change
Nutrition history	<ul style="list-style-type: none"> * Eating patterns and weight history from childhood, and significant life events * Precipitants of dieting/disordered eating * Recent daily food intake and meal pattern, 'good' and 'bad' days and how this relates to individual lifestyle * Recent daily fluid intake * Dietary methods of weight control used, including foods avoided * Binge eating behaviours: type of food, amount, frequency, triggers, duration, specific days, time, place * Frequency, type and degree of non-dietary weight losing behaviours, present and past * Self-induced vomiting, use of laxatives, diuretics and diet pills * Constipation * Alcohol, drug use * Eating patterns of household
Influences / previous nutrition education	<ul style="list-style-type: none"> * Dietary beliefs and sources * Input from previous therapists * Family beliefs and behaviours
Clinical data	<ul style="list-style-type: none"> * Diagnosis * Current and past history of eating disorders and treatment * Concurrent physical and psychiatric conditions and treatment * Menstrual history * ECG (usually as an inpatient or if rapidly losing weight as an outpatient).
Anthropometric Data	<ul style="list-style-type: none"> * Weight and height * BMI * Highest/lowest weight– occurrence in life history * Pre-morbid weight * Client's desired weight * Frequency of weighing/measuring * Family weight and body type
Biochemical data	<i>See Table 4</i>
Medication and supplements	<ul style="list-style-type: none"> * Laxatives, diuretics * Vitamin and mineral supplements * Prescribed supplements (eg iron, potassium) * Diet pills * Contraceptive pill and other prescribed medication
Social data	<ul style="list-style-type: none"> * Family environment and composition * Education level * Employment and work hours * Living arrangements * Support people

	* Language, cultural and religious background
Activity pattern	* Pre-morbid exercise pattern * Present exercise: type, duration, frequency * Reasons for exercise and relationship to eating patterns * Leisure pursuits
Relevant epidemiology	* Previous physical and psychological conditions * Family history of eating disorders

ANTHROPOMETRY	ASSESSMENT ISSUES
Height	Height to be ideally measured using a stadiometer. Measure with no shoes, early in morning (height decreases during the day due to compression of spinal fluid). For younger adults recheck height every few months as there can be a delayed growth spurt during nutritional recovery.
Weight	Essential. Weigh with no shoes, empty bladder pre weigh and minimal clothes on calibrated scales and on the same set of scales at follow up. Ideally weigh at the same time of the day. Expect up to two kilograms weight fluctuation from fluid changes. Large weight changes during re-feeding can also be a result of oedema.
Body Mass Index/Height for Weight	Essential. Required for calculating minimum healthy weight range.

Table 9: Some of the abnormal eating behaviours in anorexia nervosa
(Consensus from DAA ED IG workshops)

- Abnormal timing of meals and snacks
- Avoidance of specific foods
- Subjective or objective binge eating
- Compensatory purging activity, including exercise
- Difficulty estimating portion size
- Disproportionate time spent thinking about food
- Inability to define or eat a balanced nutrient intake
- Inability to identify hunger or satiety
- Inappropriate food combinations
- Inappropriate food utensils
- Poor food variety
- Purchasing and preparing food for other people, without eating the meal themselves
- Reduced spontaneity and flexibility concerning food intake
- Abnormal speed of eating a meal
- Unusual rigidity and rituals around food
- “Debiting” food intake e.g. with exercise/ food choices
- Excessive use of condiments e.g. salt
- Cutting food into very small pieces before eating

Appendix 3: Diagnostic Criteria

ICD-10 for Anorexia Nervosa (WHO 1992)²⁰

(This classification is preferred by the Australian and New Zealand CPGs⁵)

Body weight is maintained at least 15% below the expected (either lost or never achieved), or Quetelet's body-mass index is 17.5 or less. Pre-pubertal patients may show failure to make the expected weight gain during the period of growth.

The weight loss is self-induced by avoidance of 'fattening' foods and one or more of the following: self-induced vomiting; self-induced purging; excessive exercise; use of appetite suppressants and/or diuretics.

There is a body-image distortion in the form of a specific psychopathology whereby a dread of fatness persists as an intrusive, overvalued idea and the patient imposes a low weight threshold on himself or herself.

A widespread endocrine disorder involving the hypothalamic-pituitary-gonadal axis is manifest in women as amenorrhoea (except where women receive hormonal therapy, most commonly the oral contraceptive pill) and in men as a loss of sexual interest and potency. There may also be elevated levels of growth hormone, raised levels of cortisol, changes in the peripheral metabolism of the thyroid hormone, and abnormalities in insulin secretion.

If onset is pre-pubertal, the sequence of pubertal events is delayed or even arrested (growth ceases; in girls the breasts do not develop and there is primary amenorrhoea; in boys the genitals remain juvenile). With recovery, puberty is often completed normally, but the menarche is late.

The DSM IV Diagnostic Criteria for Anorexia Nervosa

*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision; 2000; American Psychiatric Association*²¹

- A. Refusal to maintain body weight at or above a minimally normal weight for age and height (eg, weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected. 85% of that expected is equated to a body mass index of 17.5).
- B. Intense fear of gaining weight or becoming fat, even though underweight.
- C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.
- D. In post-menarcheal females, amenorrhoea, i.e., the absence of at least three consecutive menstrual cycles (a woman is considered to have amenorrhoea if her periods occur only following hormone, eg oestrogen, administration).

Specific type:

Restricting Type: during the current episode of Anorexia Nervosa, the person has not regularly engaged in binge-eating or purging behaviour (i.e. self-induced vomiting or the misuse of laxatives, diuretics, or enemas).

DSM-IV Technical Criteria for EDNOS (as it pertains to Anorexia Nervosa)

1. All of the criteria for Anorexia Nervosa are met except the individual has regular menses.
2. All of the criteria for Anorexia Nervosa are met except that, despite substantial weight loss, the individual's current weight is in the normal range.

Appendix 4: Psychology of starvation

The Keys study⁴⁴ is of central importance in demonstrating the psychological and physical changes that occur as a result of starvation, irrespective of the presence of AN. Formerly physically healthy, psychologically stable young male subjects, who were conscientious objectors in World War 2, were restricted to half their usual food intake for 6 months, followed by 3 months of gradual re-feeding. Their general behaviour, eating patterns and any changes in mood were studied throughout. Keys found that the main cognitive changes after the subjects lost 25% of their former weight were decreased concentration, poor judgment and apathy. They experienced a dramatic and progressive increase in their preoccupation with food, recipes and cooking. They hoarded food, made unusual food mixtures, used salt and spices excessively and dramatically increased their coffee and tea consumption. These behavioural changes persisted throughout the subsequent re-feeding stage. During the food restriction and weight loss stage, the subjects also became increasingly disinterested in sex and physical activity, most experienced significant deterioration in their mood, with 20% experiencing severe depression. Irritability, anger, anxiety and apathy were common. Mood changes were also slow to reverse following re-feeding. All of these changes are commonly found in AN, indicating that the psychological, as well as physical changes in AN are exacerbated by and may largely be a result of starvation.

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