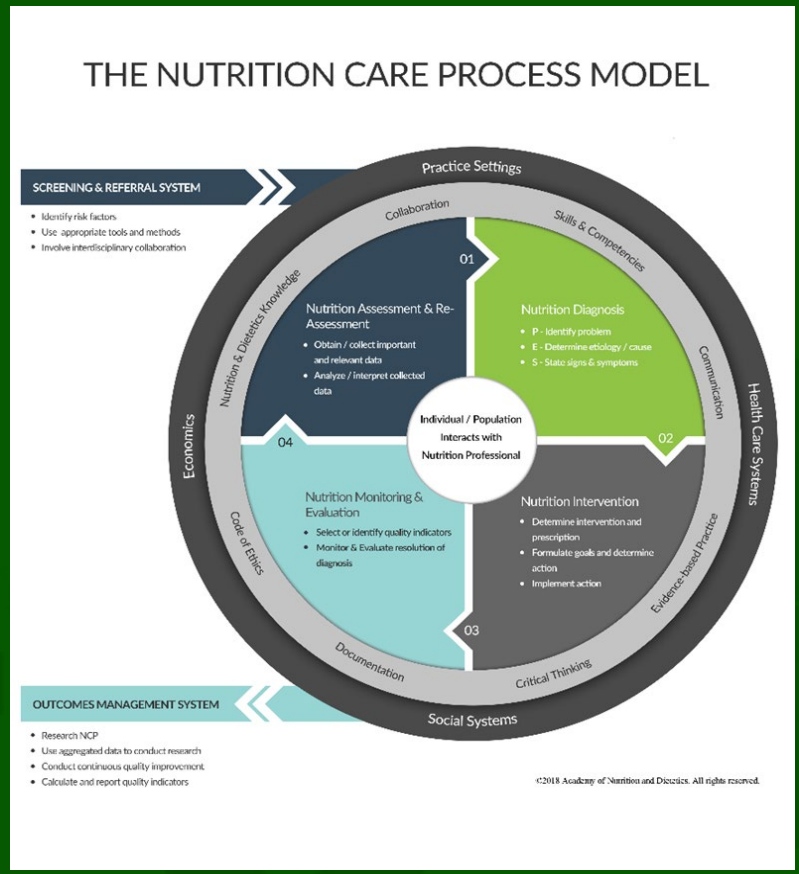
Nutrition Care Process (NCP) **Outcomes**

A primer on

- emerging research and
- best practices



Constantina (Tina) Papoutsakis, PhD, RD
Senior Director, Data Science Center
Research, International & Scientific Affairs
Academy of Nutrition and Dietetics

Objective: Outcomes Primer

The challenges posed by outcomes management are not unique to nutrition and dietetics.

- **Updates** to the Nutrition Care Process (NCP) Model and Terminology (NCPT) that impact outcomes
- Emerging **NCP research** including opportunities and challenges on how practice-based data can be collected and analyzed at scale to demonstrate **outcomes**
- Does the NCP work? **Best practices**

Why use the NCP/T?

Demonstrating dietitians' value through data and outcomes tracking advances the nutrition and dietetics profession.

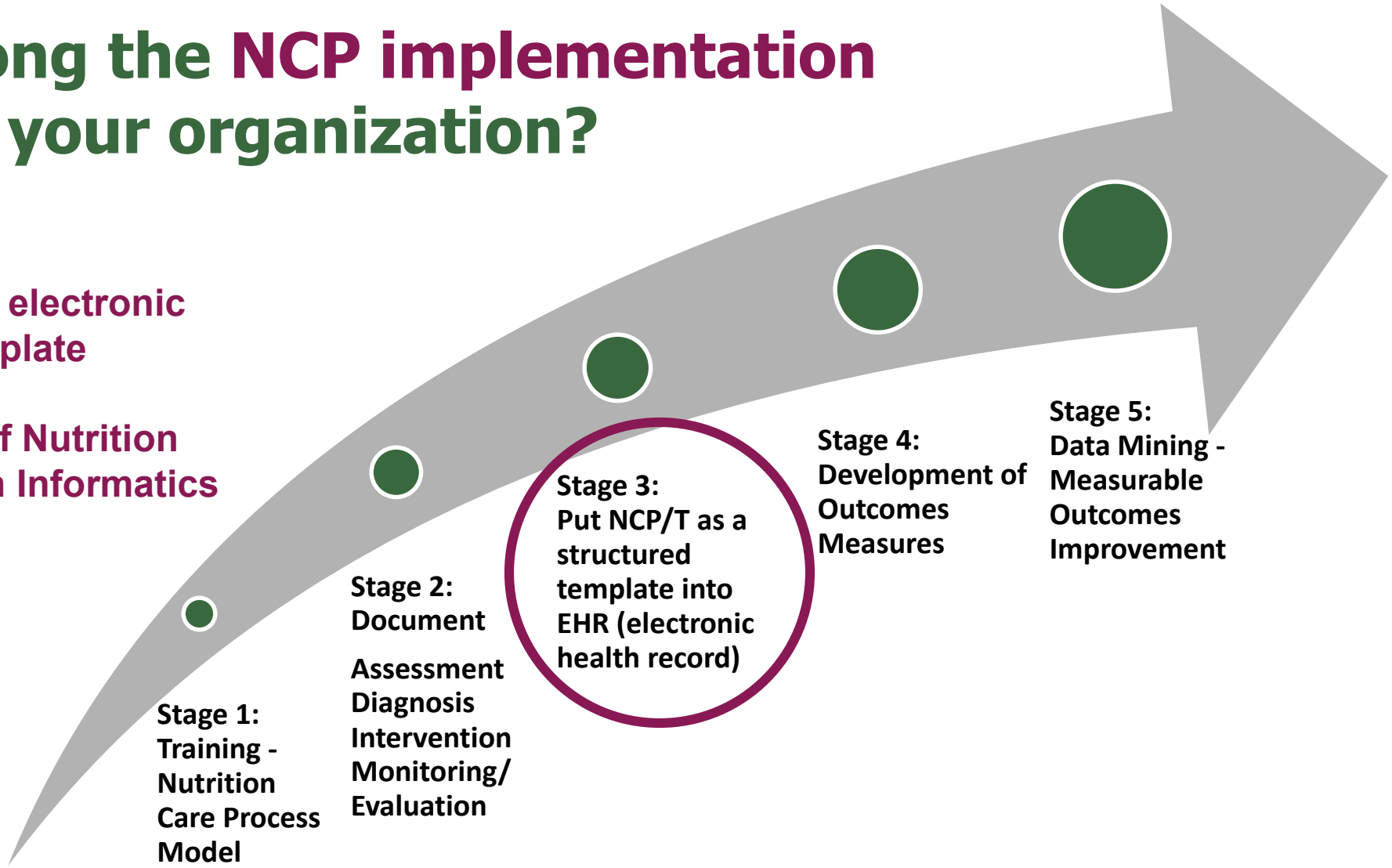
Turning practice into data

How far along the NCP implementation pathway is your organization?

ANDHII provides an electronic structured NCP template

ANDHII=Academy of Nutrition and Dietetics Health Informatics Infrastructure,

www.andhii.org



Structured Nutrition Data: **write by exception**

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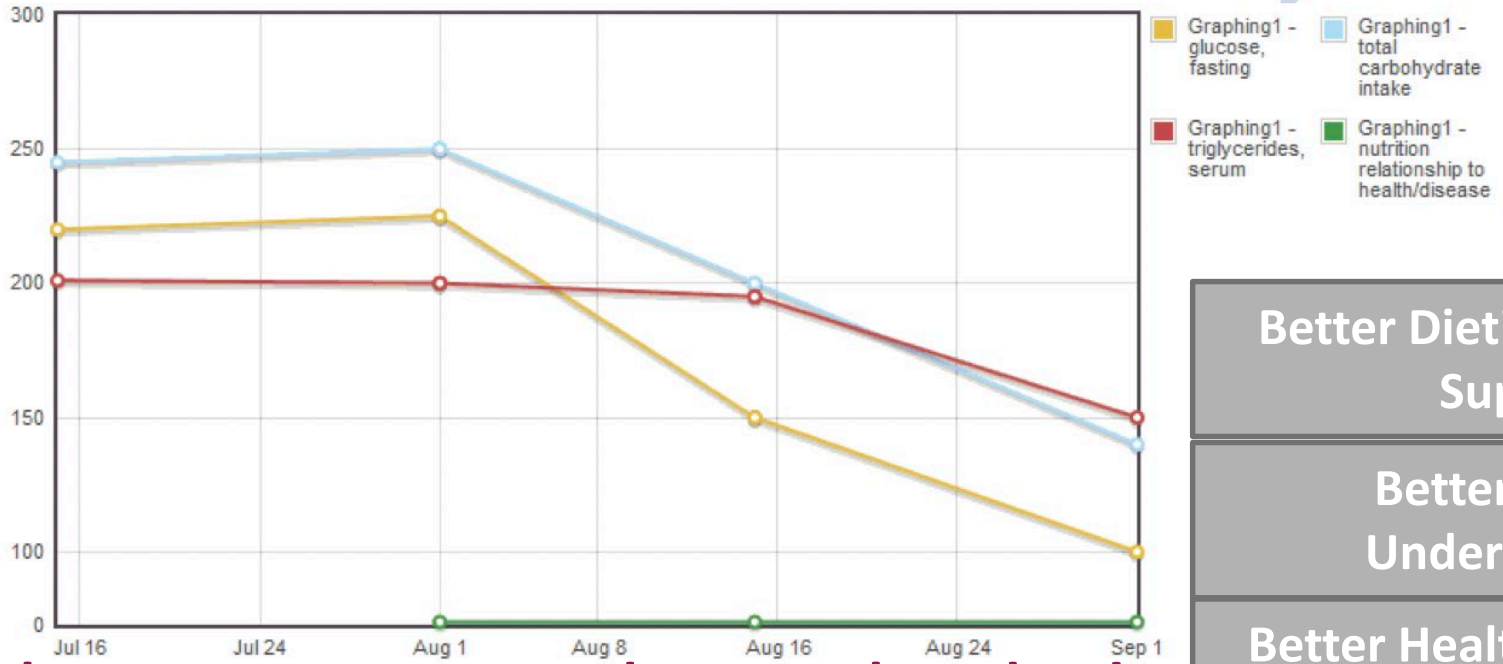
Nutrition Intervention → Lifestyle changes → Outcomes



Better Dietitian Decision Support

Better Patient Understanding

Better Healthcare System Efficiency

It is time to have a more structured approach to data!

Applying the NCP QUEST is a basic step to collect outcomes data

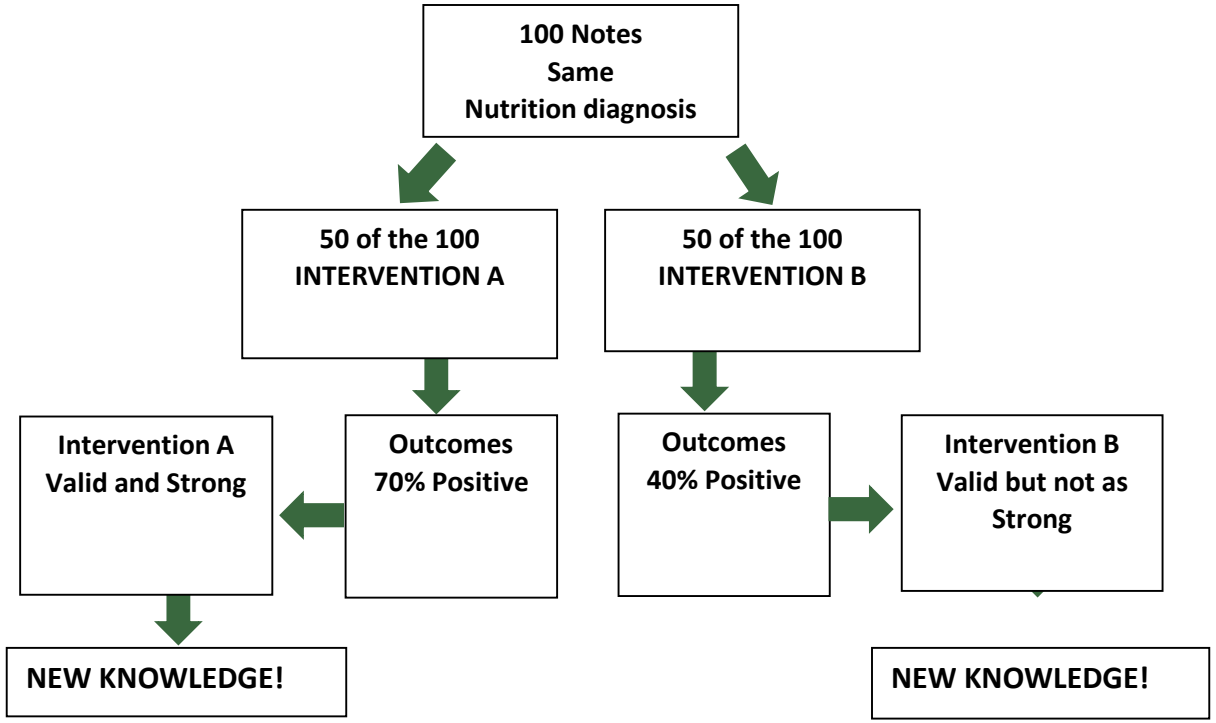
Validated Quality NCP Tool (NCP-QUEST)

Quality documentation increases the reliability of data

Reliable data enhances the ability to assess outcomes based on the effectiveness of the intervention

Identifying and comparing effectiveness leads to the ability to measure the strength and integrity of interventions

Example:



Lewis SL, Miranda LS, Kurtz J, Larison LM, Brewer WJ, Papoutsakis C. Nutrition Care Process Quality Evaluation and Standardization Tool: The Next Frontier in Quality Evaluation of Documentation. J Acad Nutr Diet. 2022 Mar;122:650-60.

What factors predict diagnosis resolution?

Variable	B(Coefficient) (standard error)	Wald	Exp(B) (95% CI)	p value
Mean Number of visits to treat Nutrition Diagnosis	0.282 (0.17)	2.84	1.3 (0.955, 1.839)	.092
Evidence-Diagnosis Link Present	2.98 (1.52)	3.86	19.74 (1.01,386.75)	.049
Etiology-Intervention Link Present	**3.94 (1.42)**	**7.74**	**51.43 (3.21,825.41)**	**.005**
Intervention-Goal Link Present	2.25 (1.24)	3.28	9.46 (0.83,107.93)	.070
Mean NCP Audit Score	0.320 (0.18)	3.29	1.38 (0.975, 1.946)	.070

Number of Visits by RDN

For every added nutrition visit by the RDN, the odds of improving the nutrition diagnosis increased by 33%

NCP Audit Score

for every increased point on the NCP audit score, the odds of resolving or improving the nutrition diagnosis increases by 38%

NCP Linking Chains

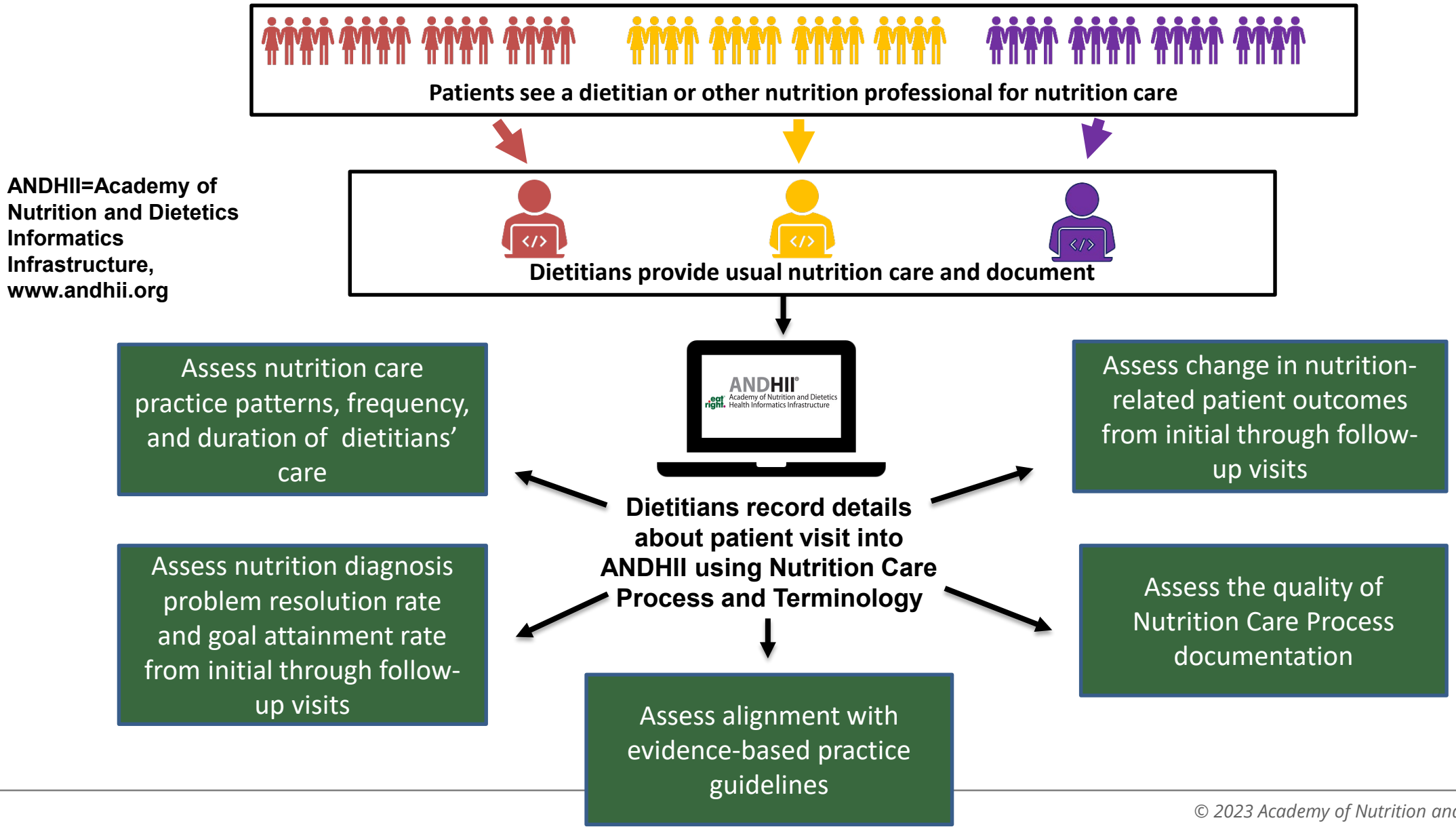
The odds of improving the nutrition diagnosis was 51 times higher when the Etiology-Intervention Link was present after controlling for other variables in the equation.

the odds of improving the nutrition diagnosis was 20 times more likely when the Evidence-Diagnosis Link was present

the odds of improving the nutrition diagnosis was 9 times more likely when the Intervention-Goal Link was present

Lewis SL, Wright L, Arikawa AY, Papoutsakis C. Etiology Intervention Link Predicts Resolution of Nutrition Diagnosis: A Nutrition Care Process Outcomes Study from a Veterans' Health Care Facility. J Acad Nutr Diet. 2021 Sep;121:1831-40.

Registry Study Design-sandbox



Pre-diabetes

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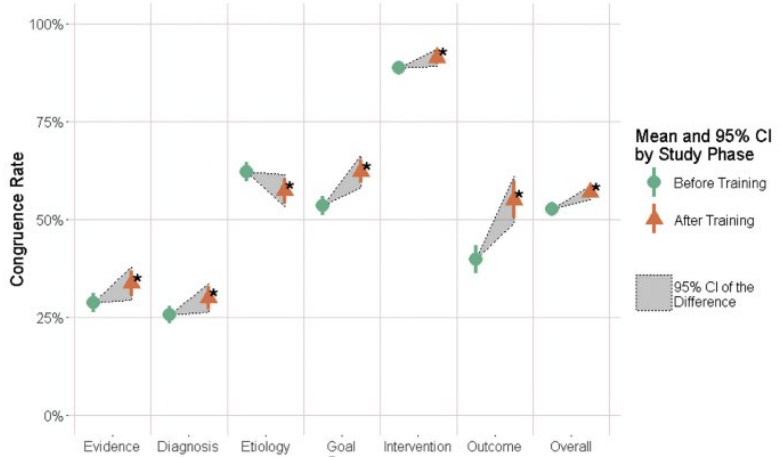
- 10 RDNs provided care to patients phase 1 (pre-training) and 8 RDNs in phase 2 (post-training)
- 102 patients diagnosed with prediabetes were entered into ANDHII
- 95 patients with two or more encounters

Improvement in outcomes

Overall, during this study that included a 3-month follow-up in each phase, reduction of the following outcomes was observed:

- 2% weight reduction
- 1.6% reduction in waist circumference
- 1% reduction in fasting blood glucose
- 1.8% reduction in glycosylated hemoglobin

Improvement in guideline congruence post-training



After training, there was improvement in guideline congruence by **4.1% (P < 0.001)** ↑ 4.1%

Guideline Improvement by NCP component:

Evidence	↑ 5%
Diagnosis	↑ 4.2%
Goal	↑ 8.7%
Intervention	↑ 2.6 %
Outcome	↑ 15 %

Murphy WJ, Hand RK, Abram JK, Papoutsakis C. Impact of Diabetes Prevention Guideline Adoption on Health Outcomes: A Pragmatic Implementation Trial. J Acad Nutr Diet. 2021 Oct;121:2090-100.e1.

Diabetes

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To understand implementation and impact of evidence-based nutrition practice guidelines…

19 RDNs documented

787 patient encounters for

562 patients with diabetes

over **2** years

~75% of patients had **1** RDN encounter

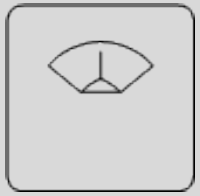
At least **1** guideline recommendation was fully implemented in **67%** of encounters

75% of patients with multiple encounters had an improving or resolved nutrition diagnosis

Patients with multiple dietitian visits had…

-9.8% ± 16.1 percent change in **HbA1c**

-19.9% ± 21.4 percent change in **fasting blood glucose**



-4.5% ± 7.2 percent change in **body weight**

Lamers-Johnson E, Kelley K, Knippen KL, Feddersen K, Sánchez DM, Parrott JS, Colin C, Papoutsakis C, Jimenez EY. A quasi-experimental study provides evidence that registered dietitian nutritionist care is aligned with the Academy of Nutrition and Dietetics evidence-based nutrition practice guidelines for type 1 and 2 diabetes. Frontiers in Nutrition. 2022 2022-September-12;9.

Outcome=result (what happened or what was accomplished because of an intervention)

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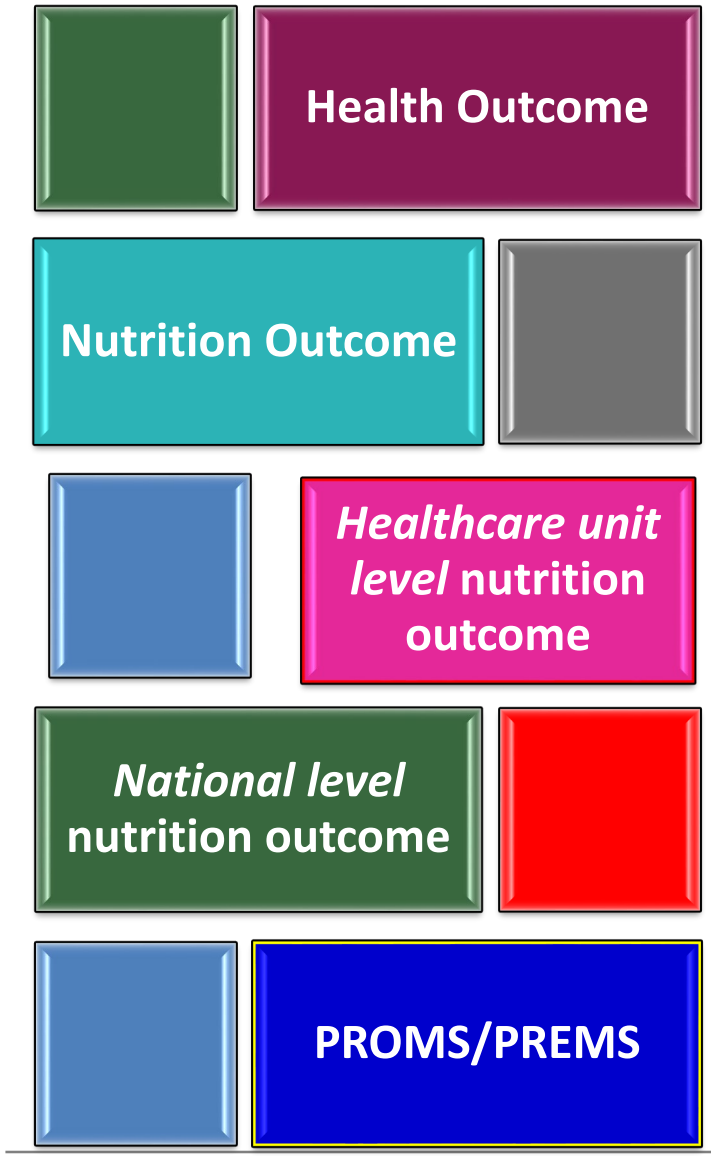

Health outcome - "a change in the health status of an individual, group or population which is attributable to a planned intervention". Examples may include: length of stay, percentage of patients achieving weight loss targets, biomarker improvement (reduction of glycosylated hemoglobin in diabetes), and **quality of life**.

Nutrition outcome - the results of nutrition care that are directly related to the nutrition diagnosis and the goals of the intervention plan.

Healthcare unit level nutrition outcome* – aggregation of results that a healthcare unit aims to achieve

National level nutrition outcome* – defined outcomes to be measured on a national level to assess the success of national healthcare, identify priorities for making improvements and inform the allocation of resources for specific healthcare (eg nutrition care).

Patient Reported Outcome Measures (PROM) -a measure of patients' perceptions of their health such as health status, functional status, and **quality of life**.
Patient Reported Experience Measures (PREM) – a measure of patients' perception of their experience with health care and their own satisfaction.

*depends on institution or environment

Examples

Nutrition Care Outcome (result or change)	Nutrition Care Indicator (variable or marker)
Weight loss or weight gain	Measured body weight
Increased/decreased energy intake	Total energy estimated intake in 24 hours
Reduced carbohydrate intake	Hemoglobin A1c (HgbA1c)

Obesity related to excess energy intake as evidenced by patient BMI of 35, and energy intake: 3500 kcal/d

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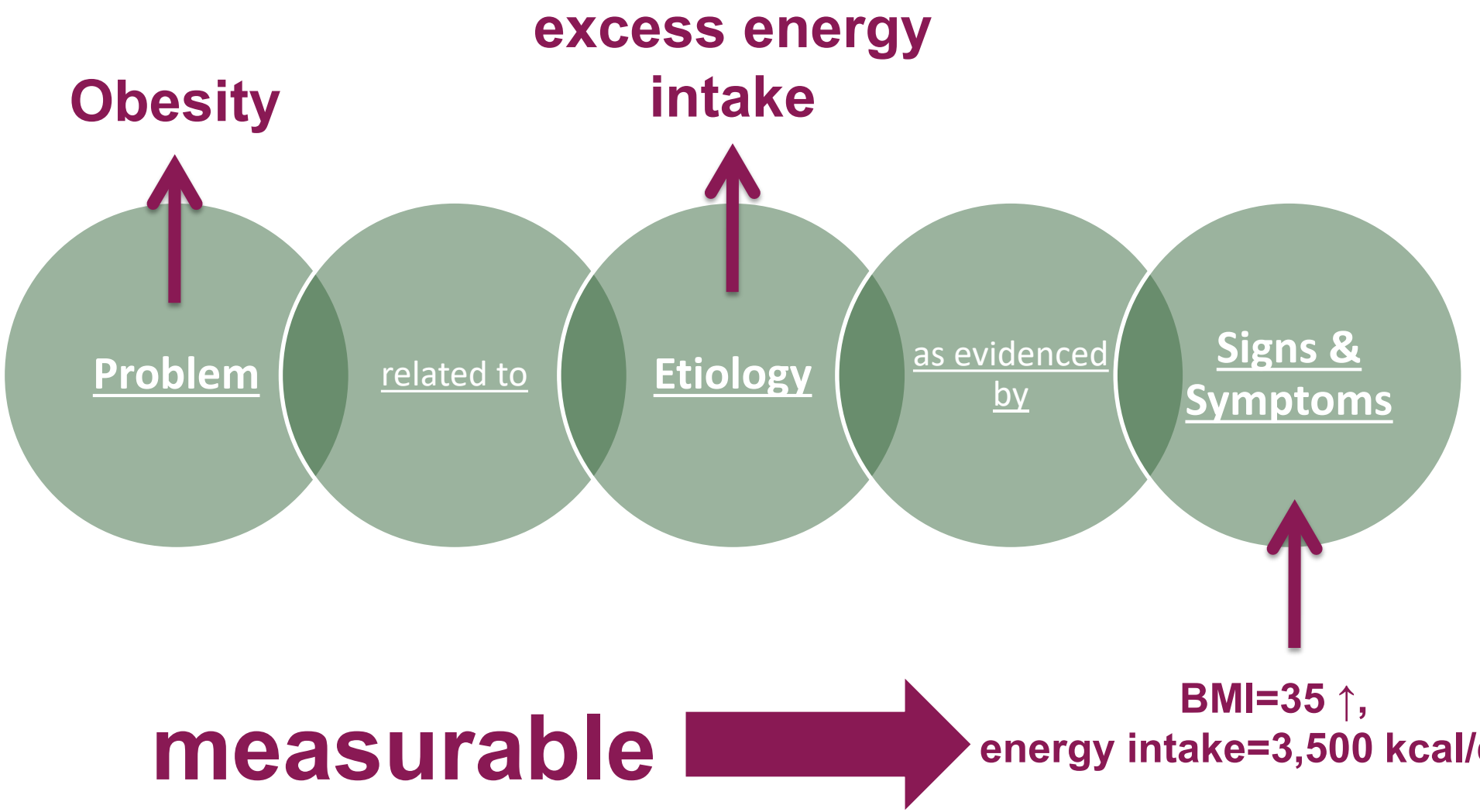


How do you track outcomes?

?

Image from www.ihi.org

What do you want to measure?

How to track outcomes (example)

-Define the problem
-Define the outcome **(begin with the end in mind)**
-Define the indicator

Situation: The patient population is adolescents with type II diabetes who have 3 or more hospital admissions per year for Diabetic Ketoacidosis (DKA).

Problem or Question: Is nutrition education effective in significantly decreasing the number of hospitalizations for adolescents with type II diabetes?

How to track outcomes (example)

Research question: Are adolescents who have Type II diabetes and are provided at least 3 nutrition education sessions per year less likely than other adolescents with type II diabetes to be hospitalized for DKA (diabetic keto acidosis)?

Once the problem is established and question is defined, the next step is to set up the methods:

Each Type II adolescent with diabetes will receive quarterly nutrition education for one year. Assessments and education will be documented in the record using NCPT and track the indicators.

Hemoglobin A1c (HgbA1c)
Number of missed appointments will be tracked.
Number of hospitalizations for DKA will be tracked.
At the end of the year, the outcomes will be measured, and the question answered by comparing data (between adolescents who received the education to adolescents who did not receive the education).

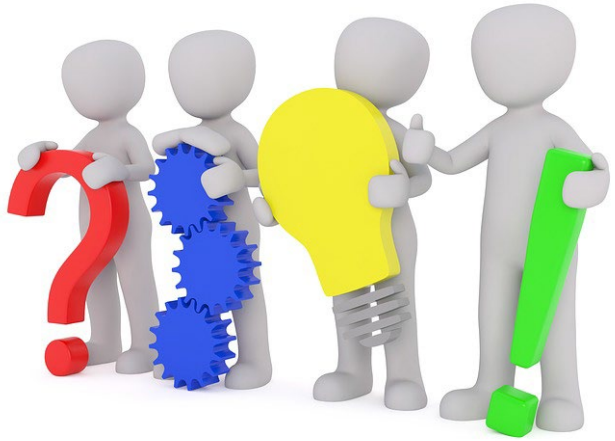
Practical application

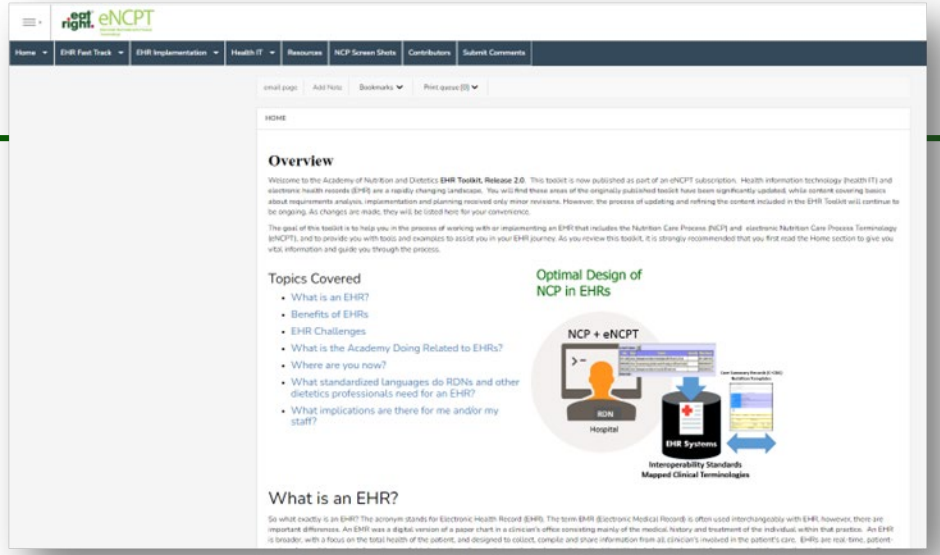
Integration of NCP/T into your electronic template– what are the barriers/facilitators to use at your site?

Use the NCP QUEST tool to better your documentation and your electronic template

Create a focused plan (begin with the end in mind) and enter data into ANDHII or other electronic NCP template & generate reports to understand the care you provide, develop a COS, and **track change (outcomes).**

Questions and Discussion





https://www.ncpro.org/the-ncpt-and-electronic-health-records

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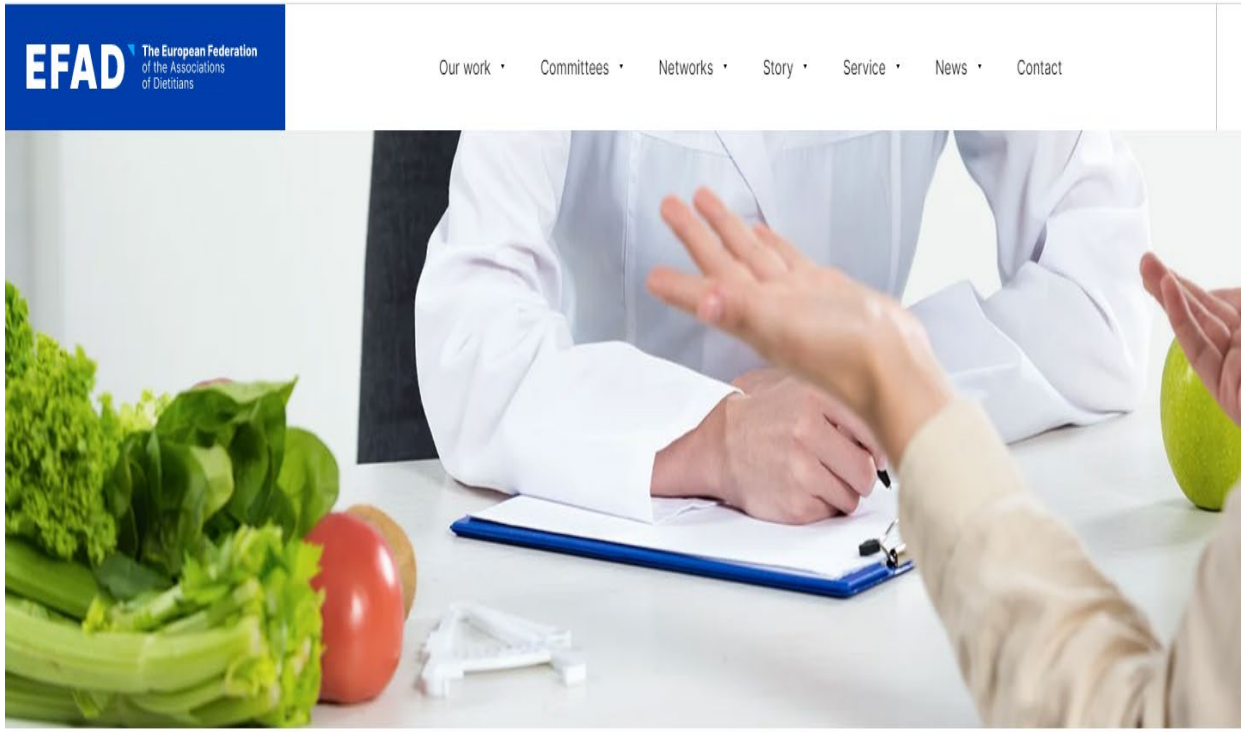
Health Informatics Infrastructure

www.andhii.org

Email: **cpapoutsakis@eatright.org**

Email: **andhii@eatright.org**

www.efad.org



EFAD The European Federation of the Associations of Dietitians
THE VOICE OF EUROPEAN DIETETICS

The importance of Outcomes Management in Dietetics

Policy paper – EFAD Professional Practice Committee – 2020

Index

Professional Practice – Our Work

This Policy Paper had been produced by the EFAD Professional Practice Committee

The mission of the PPC is to support EFAD National Dietetic Associations to enhance the professional practice of its member thereby safeguarding safety and welfare of dietetic service users and building societal trust in the dietetic profession.

EFAD Professional Practice Committee members: Silvia Kurmann, Naomi Trostler, Josie Tiebe, Ana Catarina Moreira, Constantina Papoutsakis, Chair

Want to learn more about recent research using ANDHII? Check out these manuscripts:

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Evaluating the Implementation of Evidence-based Kidney Nutrition Practice Guidelines: The AUGmeNt Study Protocol.
Proaño GV, Papoutsakis C, Lamers-Johnson E, Moloney L, Bailey MM, Abram JK, Kelley K, Steiber A, McCabe GP, Myaskovsky L, Jimenez EY.
J Ren Nutr. 2021 Oct 30:S1051-2276(21)00233-8. doi: 10.1053/j.jrn.2021.09.006. Online ahead of print.
PMID: 34728124

Applying Contemporary Machine Learning Approaches to Nutrition Care Real-World Evidence: Findings From the National Quality Improvement Data Set.
Maduri C, Sabrina Hsueh PY, Li Z, Chen CH, Papoutsakis C.
J Acad Nutr Diet. 2021 Dec;121(12):2549-2559.e1. doi: 10.1016/j.jand.2021.02.003. Epub 2021 Apr 23.
PMID: 33903081

Academy of Nutrition and Dietetics Nutrition Research Network: Validation of a Novel Nutrition Informatics Tool to Assess Agreement Between Documented Nutrition Care and Evidence-Based Recommendations.
Lamers-Johnson E, Kelley K, Sánchez DM, Knippen KL, Nadelson M, Papoutsakis C, Yakes Jimenez E.
J Acad Nutr Diet. 2021 Apr 23:S2212-2672(21)00211-2. doi: 10.1016/j.jand.2021.03.013. Online ahead of print.
PMID: 33903080

Nutrition care practice patterns for patients with COVID-19-A preliminary report.
Ansu V, Papoutsakis C, Gletsu-Miller N, Spence LA, Kelley K, Woodcock L, Wallace TC, Steiber A.
JPEN J Parenter Enteral Nutr. 2021 Nov;45(8):1774-1778. doi: 10.1002/jpen.2106. Epub 2021 Apr 22.
PMID: 33728687 Free PMC article.

Using a web-based platform to apply the Nutrition Care Process and capture nutrition outcomes and patient satisfaction in a student-led dietetic outpatient clinic: a pilot study
Roy R, Sekula J, Papoutsakis C.
Australian J of Clin Nutr. 2021; 10(1).

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Murphy WJ, Hand RK, Abram JK, Papoutsakis C.
J Acad Nutr Diet. 2021 Oct;121(10):2090-2100.e1. doi: 10.1016/j.jand.2020.11.001. Epub 2020 Dec 3.
PMID: 33279465 Clinical Trial.

A Nutrition Care Process Audit of the National Quality Improvement Dataset: Supporting the Improvement of Data Quality Using the ANDHII Platform.
Chui TK, Proaño GV, Raynor HA, Papoutsakis C.
J Acad Nutr Diet. 2020 Jul;120(7):1238-1248.e1. doi: 10.1016/j.jand.2019.08.174. Epub 2019 Oct 23.
PMID: 31668603 No abstract available.

Academy of Nutrition and Dietetics Health Informatics Infrastructure (ANDHII): A Pilot Study on the Documentation of the Nutrition Care Process and the Usability of ANDHII by Registered Dietitian Nutritionists.
Murphy WJ, Yadrick MM, Steiber AL, Mohan V, Papoutsakis C.
J Acad Nutr Diet. 2018 Oct;118(10):1966-1974. doi: 10.1016/j.jand.2018.03.013. Epub 2018 May 24.
PMID: 29804870 No abstract available.

A new breed of evidence and the tools to generate it: introducing ANDHII.
Murphy WJ, Steiber AL.J
Acad Nutr Diet. 2015 Jan;115(1):19-22. doi: 10.1016/j.jand.2014.10.025.
PMID: 25534894 No abstract available.