## 논문 작성을 위한 Figure 및 Graphic Abstract 정리방법 (adobe 프로그램중심으로)

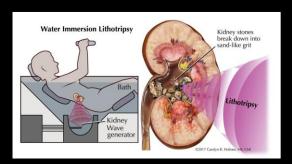
장 동수 Medical Illustrator

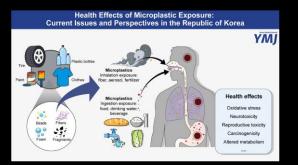


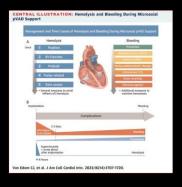
## 의학그림

## 논문그림

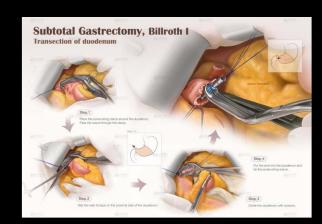


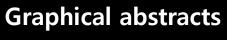




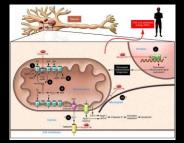




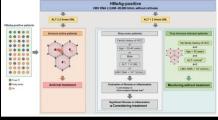




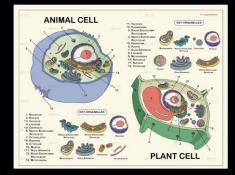
Central Illustration

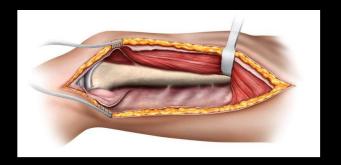


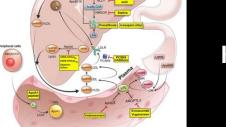
**Summary Figure** 



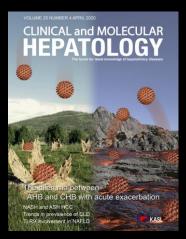
**Snapshot** 

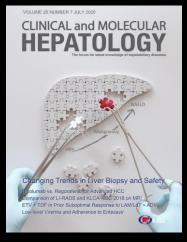


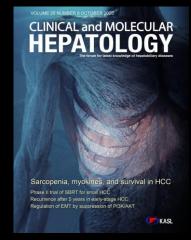


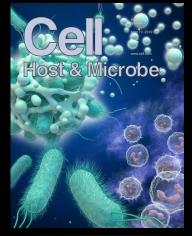


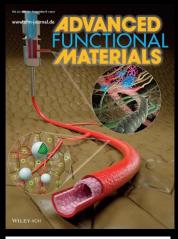
**Key Figure** 

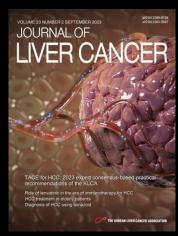


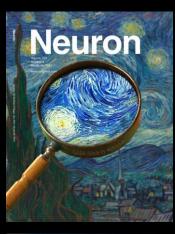




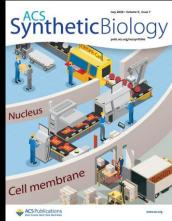


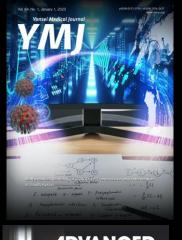


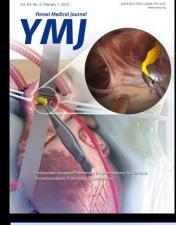


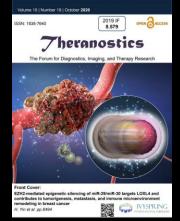


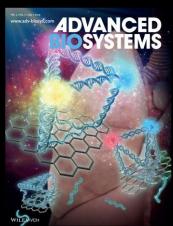




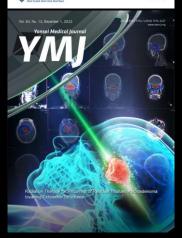


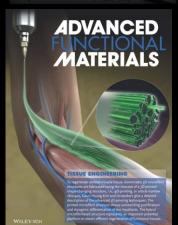


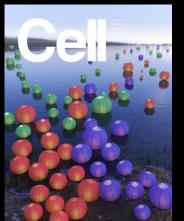


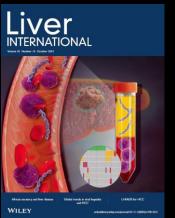






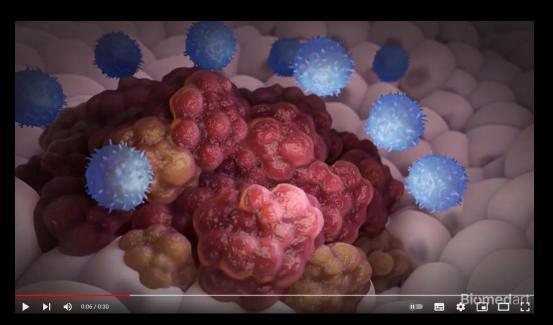




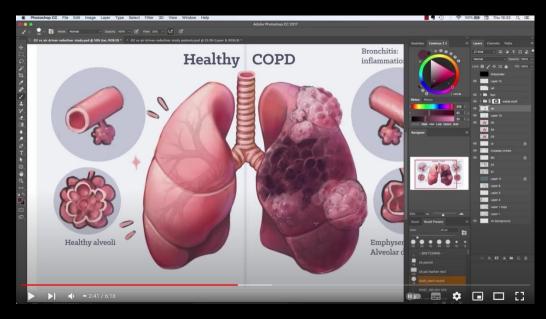


## 영상제작



















정의



아이디어



프로토타입



테스트

## Figure 정리 방법

- Figure types 구분
- Photoshop, Illustrator 차이
- RGB 와 CMYK 구분
- 꼭 필요한 Illustrator 메뉴 확인
- SPSS 그래프 추출하는 방법
- R 그래프 추출하는 방법
- embed/ Ai 이미지포함
- Clipping Mask 기능 및 Align Figure 크기와 논문형식에 맞춰
- Artboards 크기조절
- Tiff, eps 또는 PDF 변환

## Graphical abstract 제작방법

- Graphical Abstract 유형
- GA 필요한 콘티 설정하는 방법
- Adobe Illustrator Tool익히기 (그림관련 Tool)
- 사진 또는 밑그림을 활용한 그림 그리는 방법
- library 를 활용한 이미지 제작방법
- 통계(SPSS, R, Prism) vector
   추출방법
- Target 저널 유형에 맞춰 이미지 추출방법

## Graphical Abstract 제작

Figure 제작





논문의 그래픽 초록 작업이 가능한 프로그램 추천 부탁드립니다.



논문이나 연구 논문의 그래픽 초록 작성은 다양한 그래픽 디자인 및 이미지 편집 소프트웨어를 사용하여 수 행할 수 있습니다. 그래픽 초록을 디자인하는 데 사용할 수 있는 인기 있는 프로그램은 다음과 같습니다.



















crello

- 1. Adobe Illustrator: Adobe Illustrator는 복잡하고 상세한 일러스트레이션을 만드는 데 널리 사용되는 전문 벡터 그래픽 편집기입니다. 모양. 텍스트 및 색상을 정밀하게 제어해야 하는 경우 탁월한 선택입니다.
- 2. Adobe Photoshop: Photoshop은 이미지 및 그래픽 작업에 적합한 또 다른 Adobe 제품입니다. 래스터 기반이므로 이미지와 사진이 포함된 그래픽 추상에 가장 적합합니다.
- 3. Canva: Canva는 다양한 템플릿과 디자인 요소를 제공하는 사용자 친화적인 웹 기반 디자인 도구입니다. 광범위한 디자인 기술 없이도 눈길을 끄는 그래픽을 만드는 데 적합합니다.
- 4. **Inkscape:** Inkscape는 Adobe Illustrator와 유사한 무료 오픈 소스 벡터 그래픽 편집기입니다. 비용 없이 전문가 수준의 기능이 필요한 사람들에게 탁월한 선택입니다.
- 5. **GIMP(GNU 이미지 조작 프로그램):** GIMP는 Adobe Photoshop과 유사한 무료 오픈 소스 래스터 그래 픽 편집기입니다. 이미지와 사진 작업을 위한 탁월한 선택입니다.
- 6. **Microsoft PowerPoint:** 간단하고 널리 액세스할 수 있는 옵션을 찾고 있다면 PowerPoint를 사용하여 그래픽 초록을 만들 수 있습니다. 기본 디자인 도구를 제공하며 대부분의 사람들이 액세스할 수 있습니다.
- 7. **Keynote(Mac 사용자용):** Keynote는 Apple의 프레젠테이션 소프트웨어로, macOS에서 그래픽 초록을 만드는 데 사용할 수 있습니다. 사용자 친화적이며 다양한 디자인 도구를 제공합니다.
- 8. **온라인 도구:** 그래픽 초록을 쉽게 만드는 데 도움이 되는 Piktochart, Visme, Crello와 같은 다양한 온라 인 디자인 도구와 플랫폼이 있습니다. 이러한 도구는 종종 템플릿과 끌어서 놓기 기능을 제공합니다.

소프트웨어 선택은 도구에 대한 친숙도와 그래픽 초록에 대한 특정 요구 사항에 따라 달라집니다. 귀하의 필요에 맞는 프로그램을 선택할 때 복잡성 수준, 예산 및 설계 기술을 고려하십시오. 또한, 귀하의 연구를 제출하려는 기관이나 저널에서 제공하는 그래픽 초록에 대한 지침이나 형식 요구 사항을 따르는 것이 중요합니다.





**CorelDRAW**° GRAPHICS SUITE Designer2



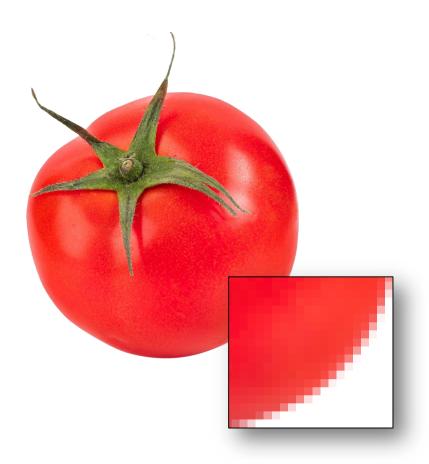


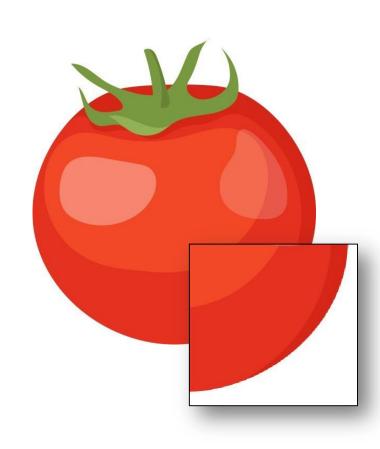
유료프로그램

무료 프로그램

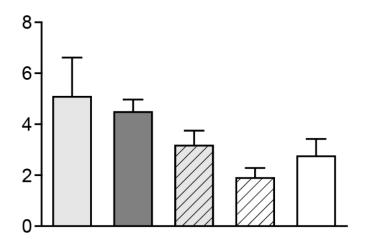
## **Raster Images** (Bitmap)

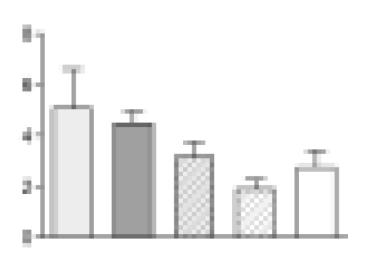




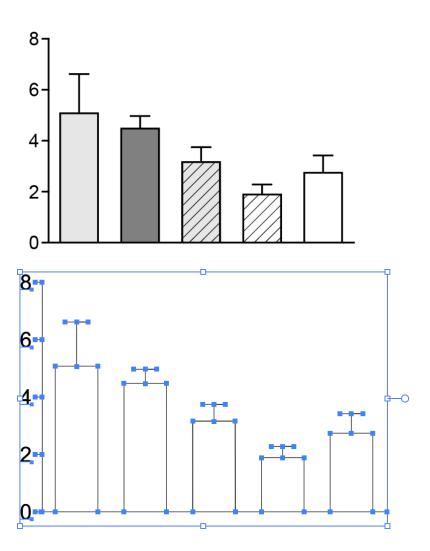


# Raster Images (Bitmap)





### **Vector**

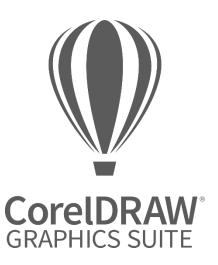


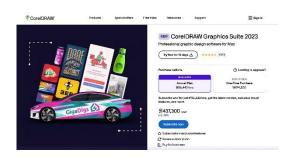
#### 유료프로그램





7일 무료 평가판 (신용 카드 등록후 가능) 첫 해 ₩23,100/ 월, 이후 갱신 시 ₩35,200/월





15일 무료 평가판 (신 용카드 등록 없음) 월 36,442원





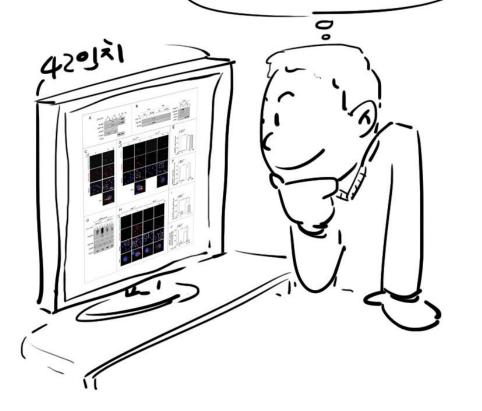
AFFINITY Designer2

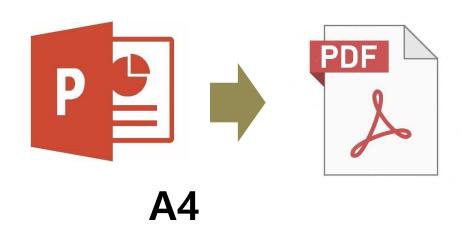
30일 무료 평가판 소장용 99,000원

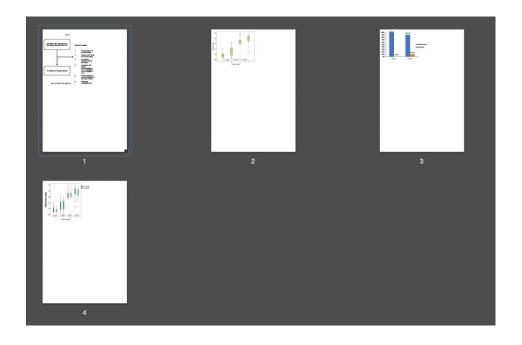


Print Screen SysRq

해상도는 문제 없겠어..!





















#### Fig1 7.5 inch 기준

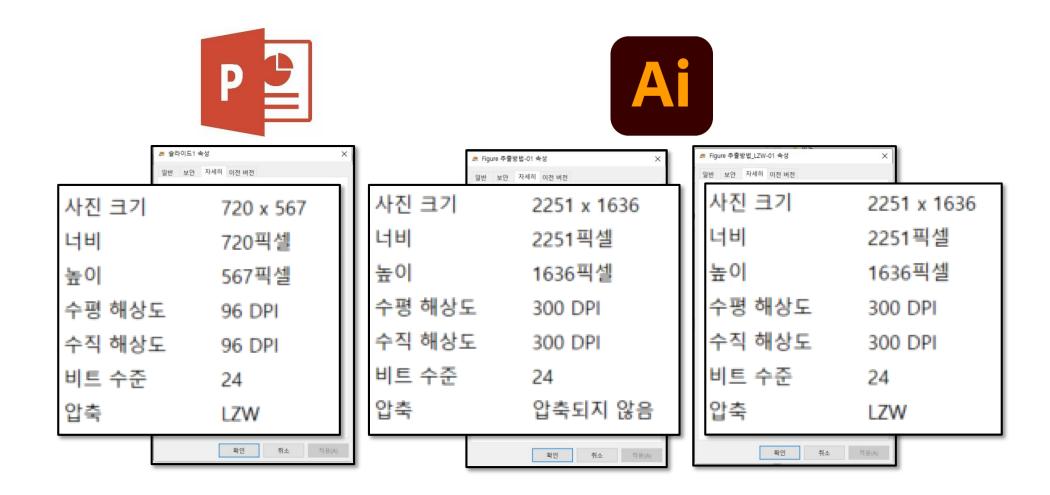


Fig1(크기: 7.5 inch, 용량: 29.4KB) Fig1(크기: 7.5 inch, 용량: 10.8MB) Fig1(크기: 7.5 inch, 용량: 382KB)



## Raster Images



Fig1(크기: 7.5 inch, 용량: 10.8MB)

Fig2(크기: 5 inch, 용량: 7.30MB)

Fig3 (크기: 5.5 inch, 용량: 10.2MB)



LZW(압축파일)

Fig1<del>(크기: 7.5 inch,</del> 용량: 382KB)

Fig2(크기: 5 inch 용량: 292KB)

Fig3 (크기: 5.5 inch 용량: 391KB)

## **Vector Images**



PDF

Fig1(크기: 7.5 inch, 용량: 1.44MB)

Fin2(크기· 5 inch 용량: 1.31MB)

Fig3 (크기: 5.5 inch, 용량: 0.98MB) Fig1(크기: 7.5 inch, 용량: 72.8KB)

Fig2(크기: 5 inch 용량: 73.0KB)

Fig<sup>3</sup> (크기: 5.5 inch, 용량: 73.0KB)



**A4** Fig1 Fig1 Fig2 Fig2 **Artboard tool** 



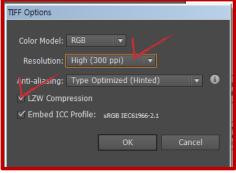






PDF Import Options



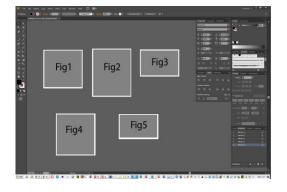








## Tiff & eps





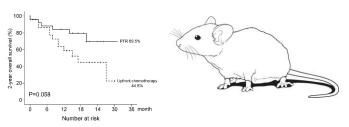






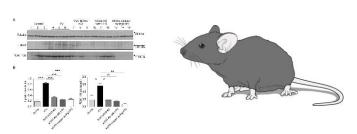
Format: **eps**, **svg**, emf, wmf

## Figure types 구분



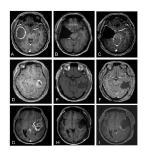
#### **Line Art**

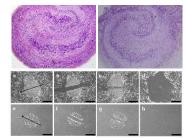
(1000dpi 음영 없는 흑백 그래픽)



### **Grayscale**

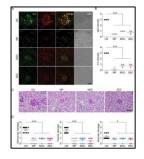
(300 dpi)

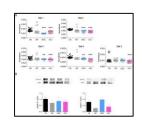




#### **Halftones**

(300dpi 흑백 또는 칼라 글씨 없는 이미지)





## **Combination Figures**

(600-900dpi 흑백 또는 칼라 글씨 있는 이미지)

#### **Format**

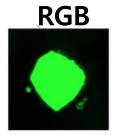
Tiff: Tagged Image File Format EPS: Encapsulated PostScript

**Tiff**(Minimum Resolution: 300 dpi)

**EPS or PDF** 



Differentiating RGB and CMYK





- Statistics(SPSS, R, PRISM, Excel, etc), export(eps, svg)
- Resizing resolution and Artboards based on the journal instructions
- Converting into Tiff, eps, or PDF

Raster Images (Bitmap)

Vector

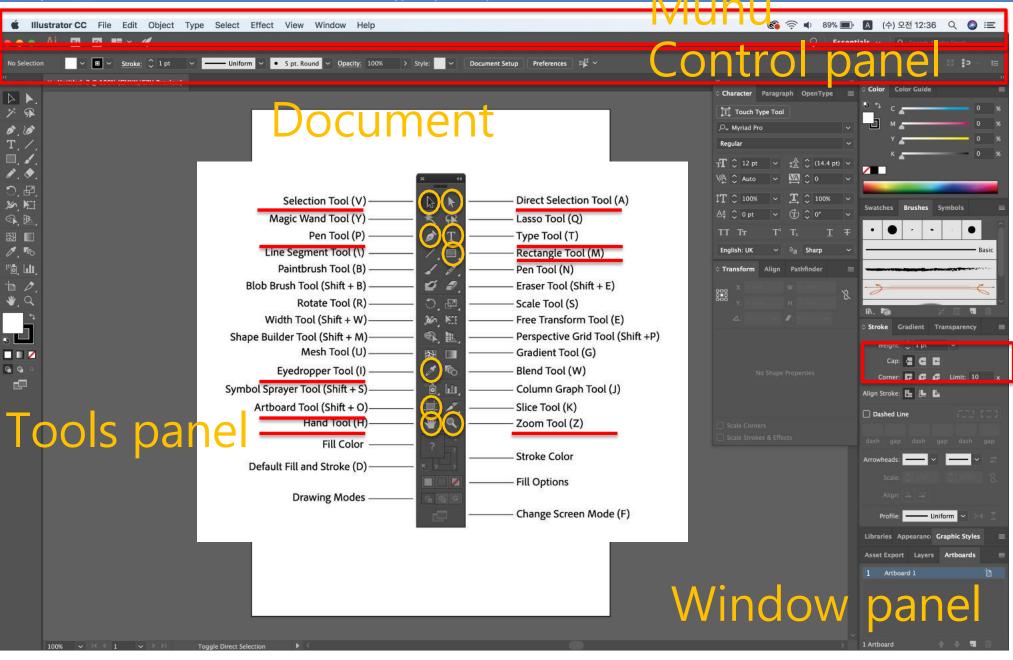
PSD TIFF JPEG GIF PNG

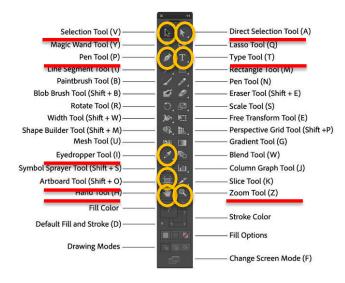
AI EPS SVG EMF WMF

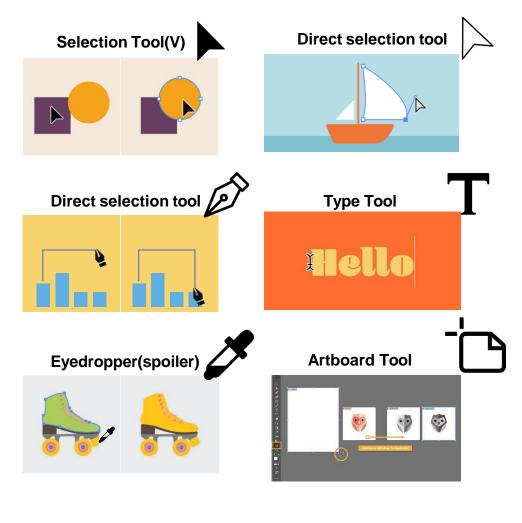
• • •

• • •

#### 꼭 필요한 Illustrator 메뉴 확인











**Zoom Tool** 



### Window 단축키

control + c 복사

control + v 붙여넣기

control + z 실행 취소

control + x 잘라내기

control + f 앞으로 가져오기

control + b 뒤로 보내기

control + 2 고정하기

control + alt + 2 고정해제

control + 3 감추기

control + alt + 3 나타내기

control + G 그룹하기

control + shift + G 그룹풀기

#### Mac 단축키

command + c 복사

command + v 붙여넣기

command + z 실행 취소

command + x 잘라내기

command + f 앞으로 가져오기

command + b 뒤로 보내기

command + 2 고정하기

command + alt + 2 고정해제

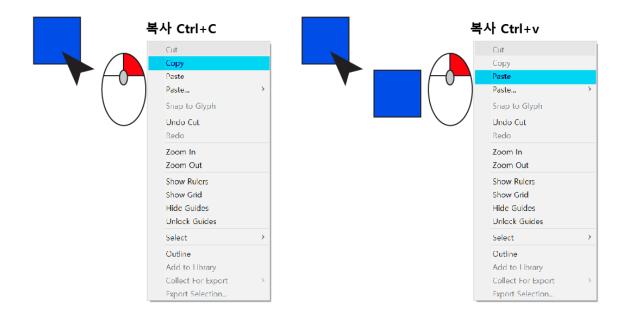
command + 3 감추기

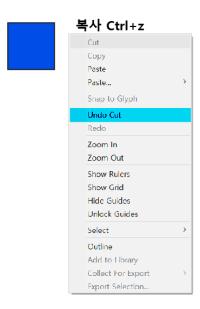
command + alt + 3 나타내기

command + G 그룹하기

command + shift + G 그룹풀기

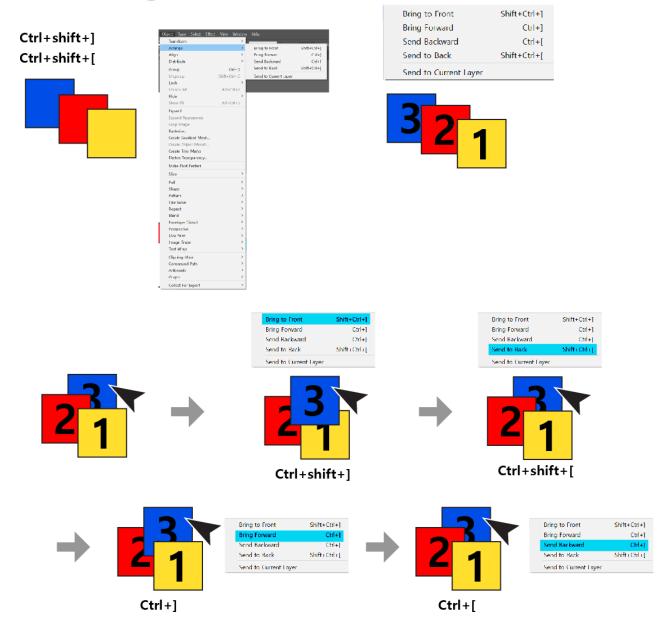
## Copy & Paste

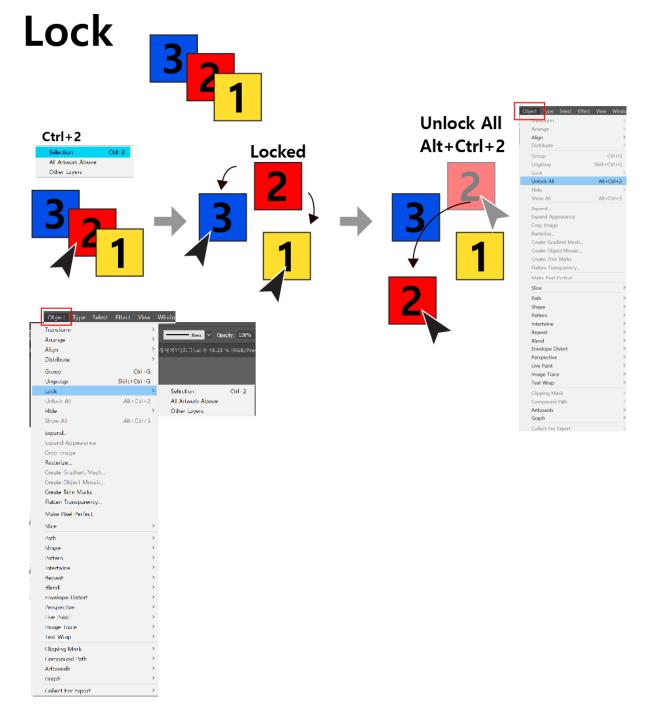




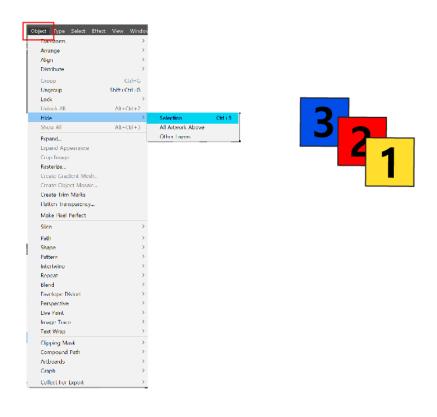


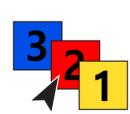
## **Arrange**





## **Hide & Show All**



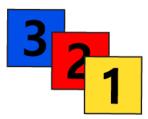


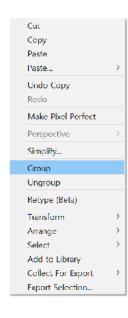




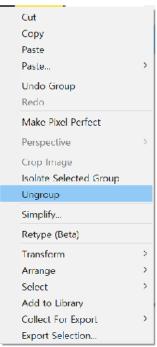
I	Object Type Select	Fffect	View	Windo
	Stroke Weight			>
i	Arrange			>
	Align			>
	Distribute			>
	Group	Ctrl+G		
Ungroup		Shift   Ctrl   G		
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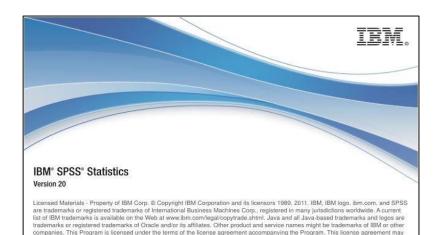








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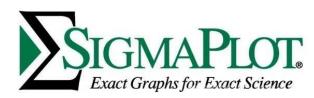
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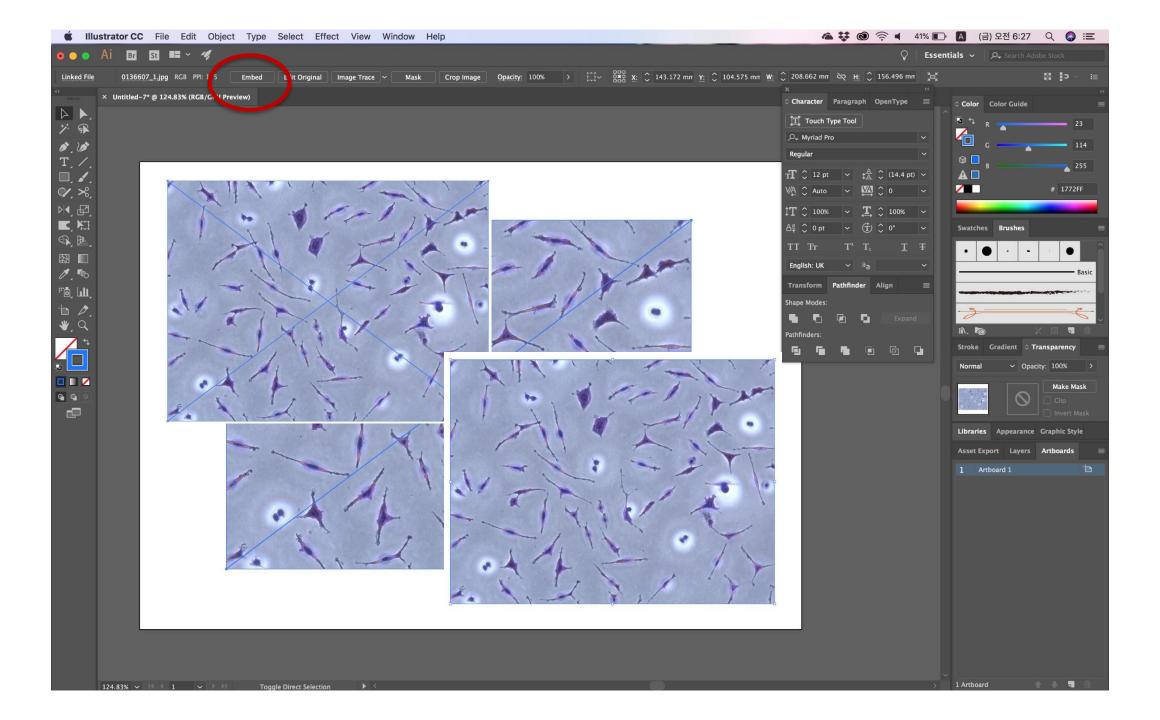




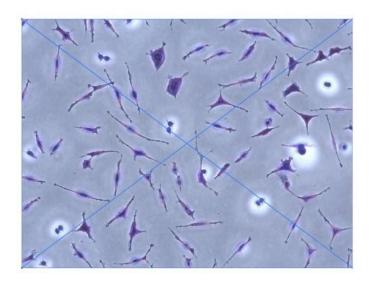


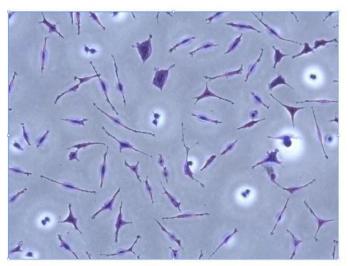


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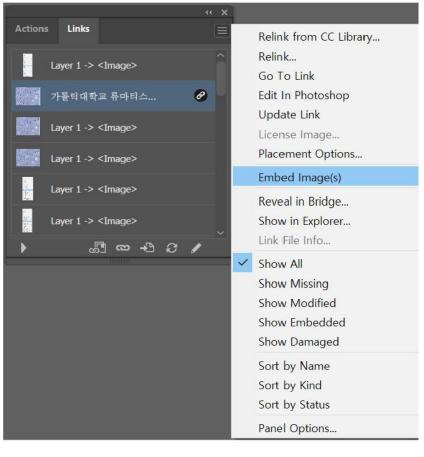


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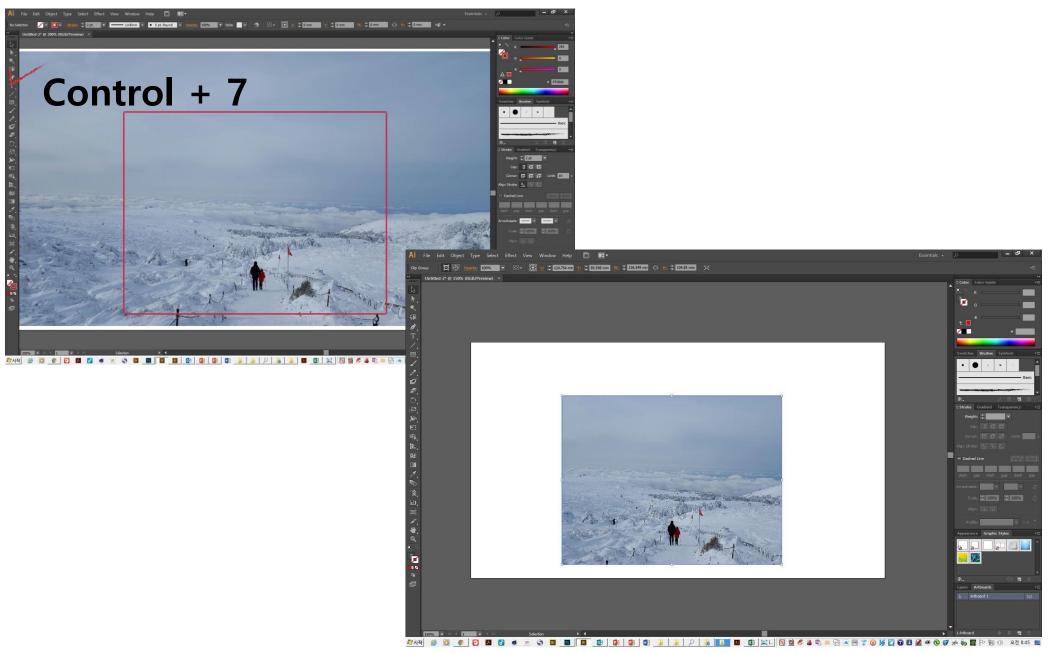


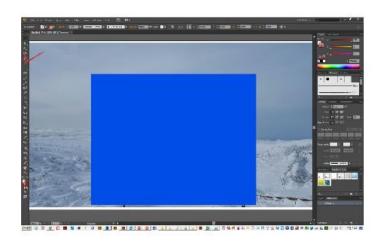






## Clipping Mask 기능 및 Align



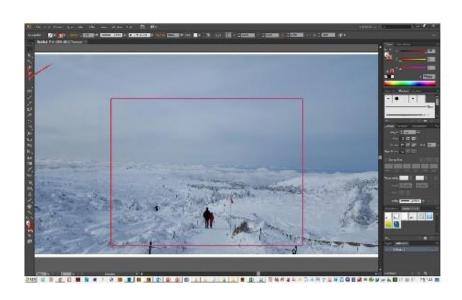




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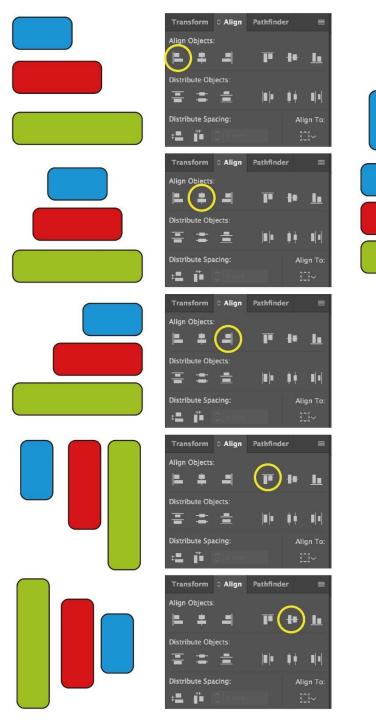


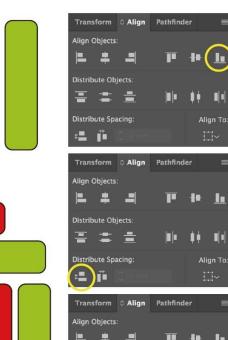


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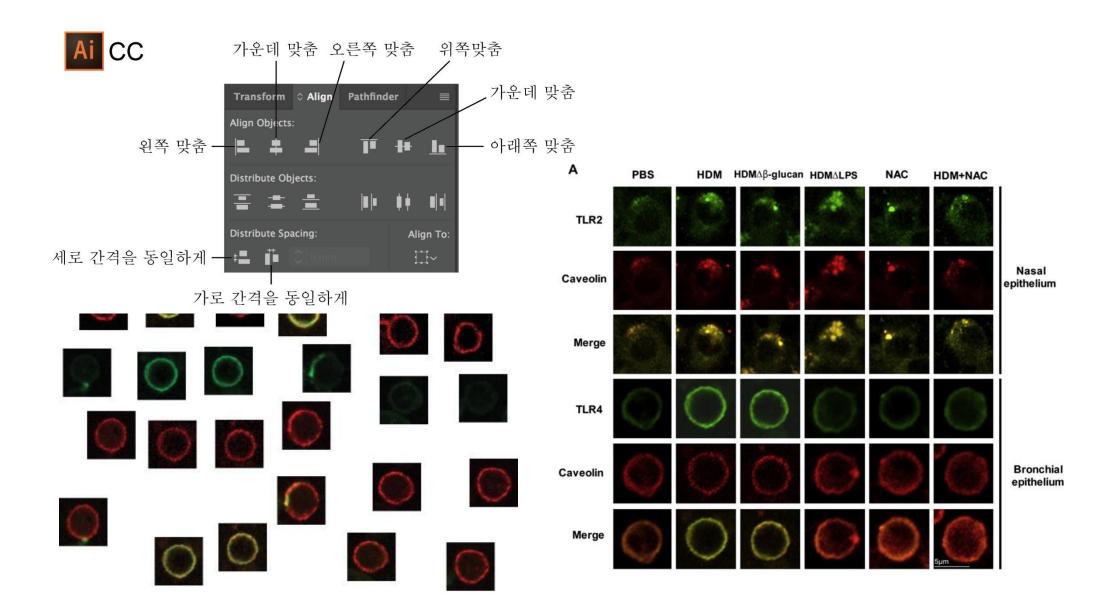




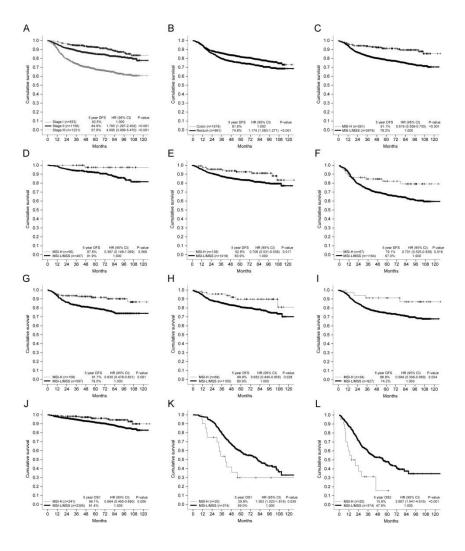




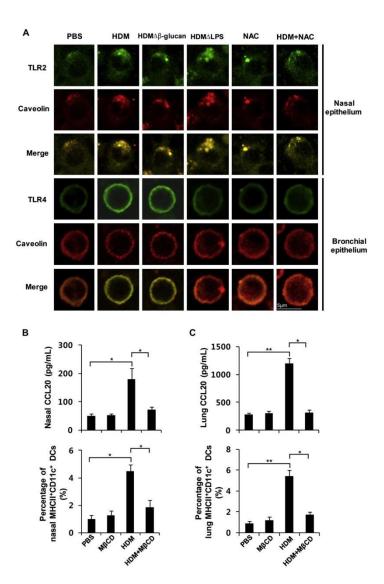


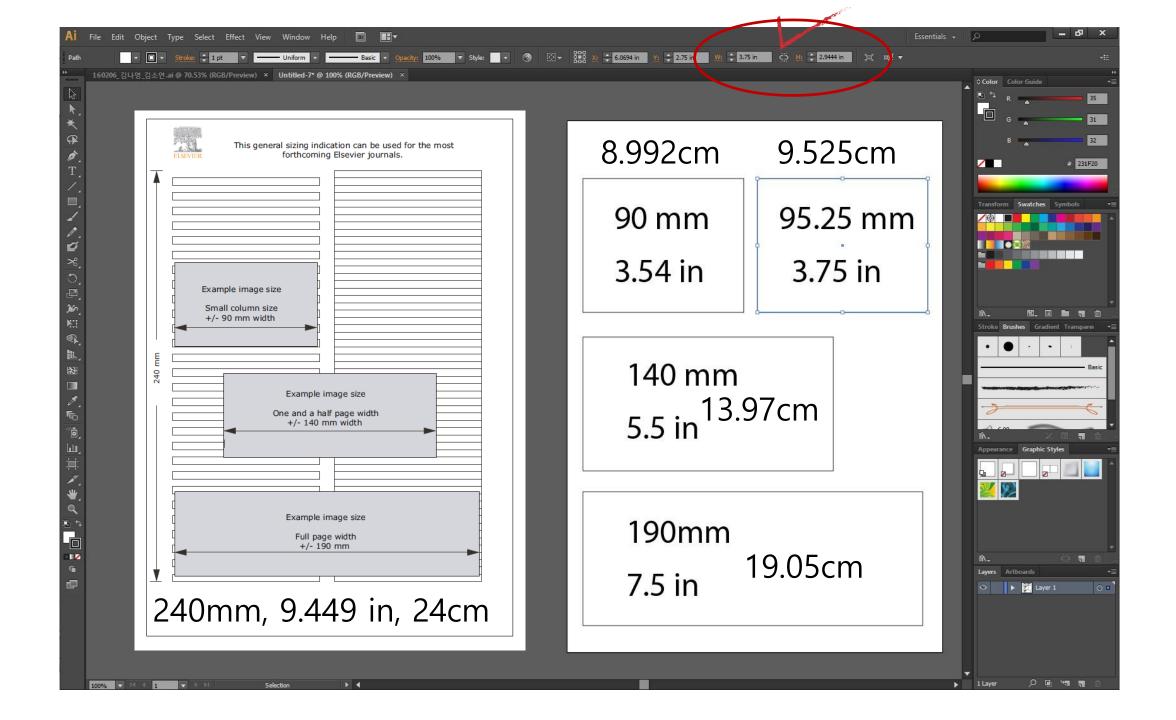


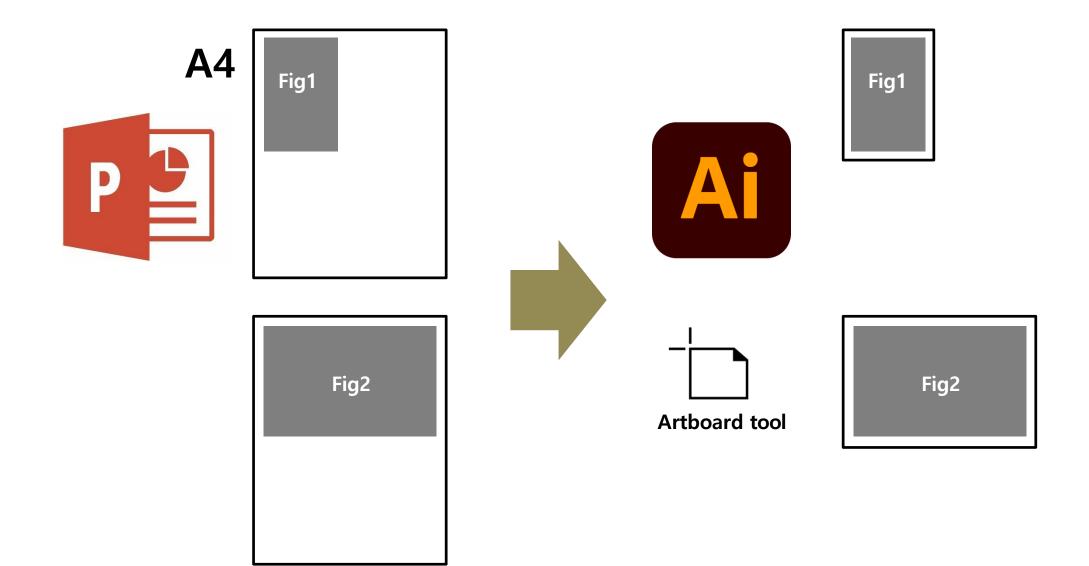
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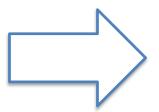
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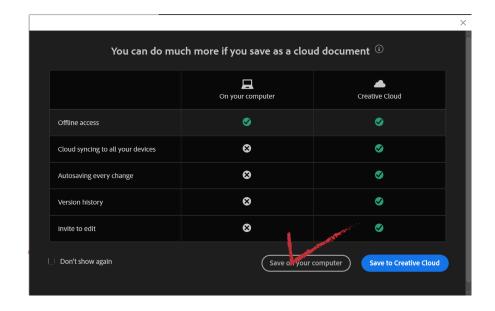


# PDF









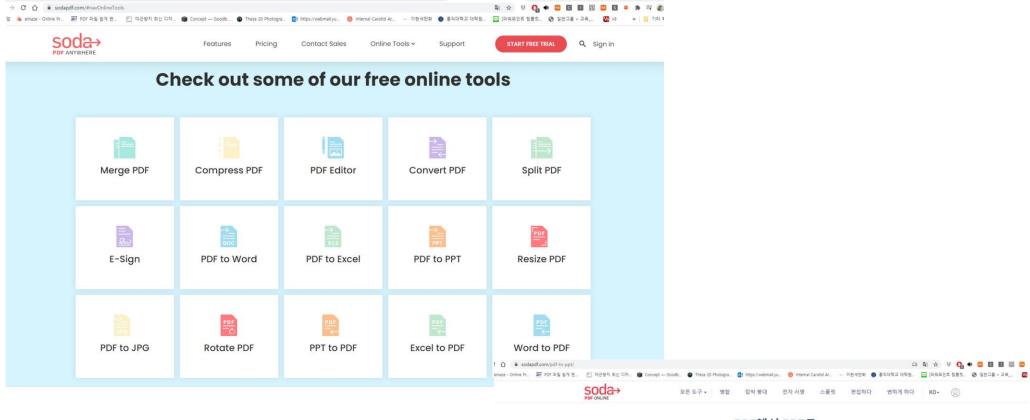






PPT 정기 사 Tiff & PDF PS Wmf, PS emf, 기타 파일 보관



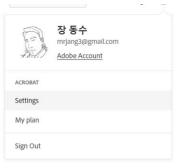


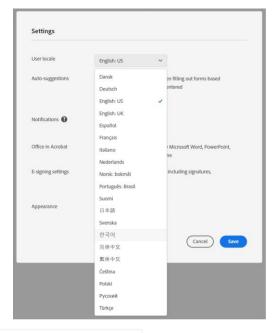




#### PDF를 PPT로 변환하는 방법

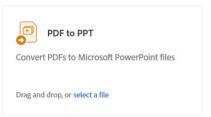
## **Adobe Acrobat**





#### Convert



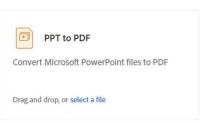


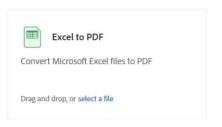








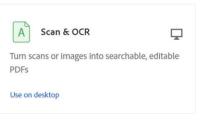




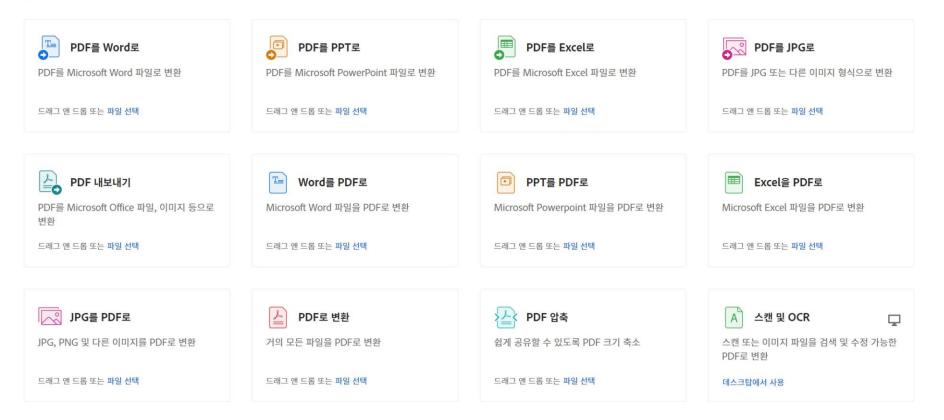


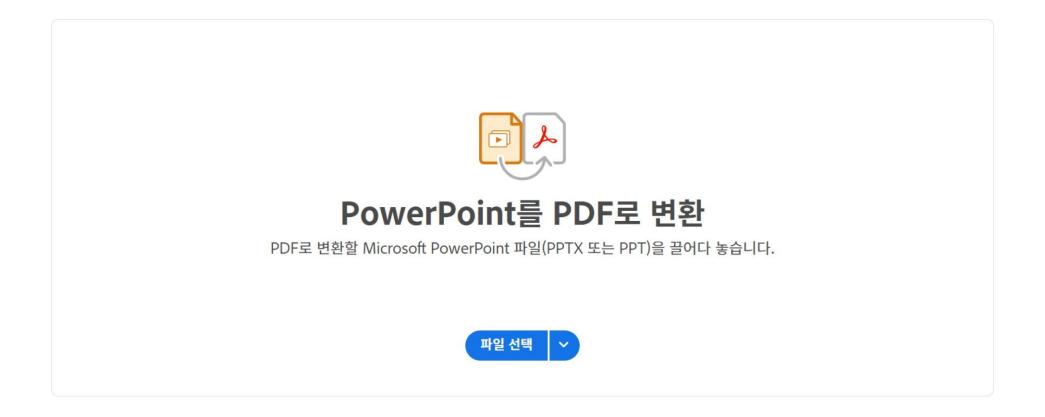




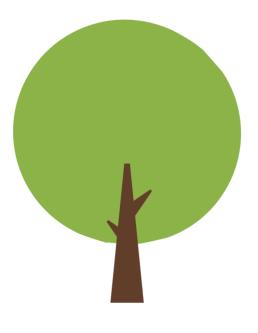


#### 변환









#### **Acute Kidney Injury and Risk of Heart Failure and Atherosclerotic Events**

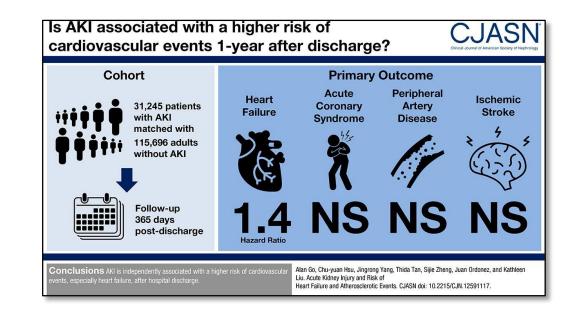
#### Abstract

Baokground and objectives AKI in the hospital is common and is associated with excess mortality. We examined whether AKI is also independently associated with a higher risk of different cardiovascular events in the first year after discharge.

Design, setting, participants, & measurements We conducted a retrospective analysis of a cohort between 2006 and 2018 with follow-up through 2014, within Kalser Permanente Northern California. We identified all adults admitted to 21 hospitals who had one or more in-hospital serum creatinine test result and survived to discharge. Occurrence of AKI was on the basis of Kidney Disease: improving Global Outcomes diagnostic criteria. Potential confounders were identified from comprehensive inpatient and outpatient, laboratory, and pharmacy electronic medical records. During the 866 days after discharge, we ascertained occurrence of heart failure, acute coronary syndromes, peripheral artery disease, and isohemic stroke events from electronic medical records.

Results Among a matched cohort of 146,941 hospitalized adults, 31,245 experienced AKI. At 366 days postdischarge, AKI was independently associated with higher rates of the composite outcome of hospitalization for heart failure and atherosolerotic events (adjusted hazard ratio [aHR], 1.18; 95% confidence interval [95% Ci], 1.13 to 1.25) even after adjustment for demographics, comorbidities, preadmission eGFR and proteinuria, heart failure and sepsis complicating the hospitalization, intensive care unit (ICU) admission, length of stay, and predicted in-hospital mortality. This was driven by an excess risk of subsequent heart failure (aHR, 1.44; 95% Ci, 1.33 to 1.56), whereas there was no significant association with follow-up atherosolerotic events (aHR, 1.06; 95% Ci, 0.98 to 1.12).

Conclusions AKI is independently associated with a higher risk of oardiovascular events, especially heart failure, after hospital discharge.



## Graphical Abstract (그래픽 초록)이란?

- 논문의 주요 발견 사항을 시각적으로 요약
- 빠르게 이해할 수 있도록 가독성 높은 이미지

- 시작과 끝이 명확
- 순서는 위에서 아래로 또는 왼쪽에서 오른쪽으로

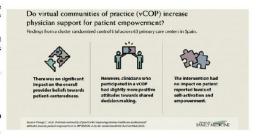
## Graphical Abstract (그래픽 초록)장점

PURPOSE We aimed to evaluate the effectiveness of a virtual community of practice (vCoP) in improving primary health care professionals' (HCPs') attitudes toward empowering patients with chronic disease.

METHODS We conducted a cluster randomized controlled trial. Practices were units of randomization, and primary HCPs and p atients were units of analysis. Sixty-three practices in Madrid, C atalonia, and the Canary Islands were randomly allocated to the intervention or control groups. Randomization of practices was performed after HCP and patient recruitment. The patients and statistician were anonymized to group allocation: it was not possible to anonymize HCPs. The intervention was a 12-month mul ticomponent tailcred vCaP built on the Web 2.0 concept and focused on skills toward patient empowerment. The primary outcome was Patient-Provider Orientation Scale (PPOS) score at baseline and at 12 months. The secondary outcome was the Patie int Activation Measure (PAM) score.

**RESULTS** A total of 321 HCPs and 1,921 patients were assess ed. The intervention had a positive effect on PPOS total score (0.14 points higher in the vCoP arm; 95% CI, 0.03-0.25; P=.01 1) and the PPOS Sharing subscale (0.3 points higher in the vCo P arm; 95% CI, 0.15-0.44; P< 001). No effect was found for the PPOS Caring subscale, and no significant differences were found for PAM scores.

CONCLUSIONS A vCoP led to a minor increase in the PPOS S haring component and the total score but not in the Caring component. However, considerable uncertainty remains, given the observed attrition and other limitations of the study. Further research is needed on the effectiveness of the vCoP model and on how to improve HCP engagement.









공간을 작게 활용하여 간단 명료하게 메시지 전달

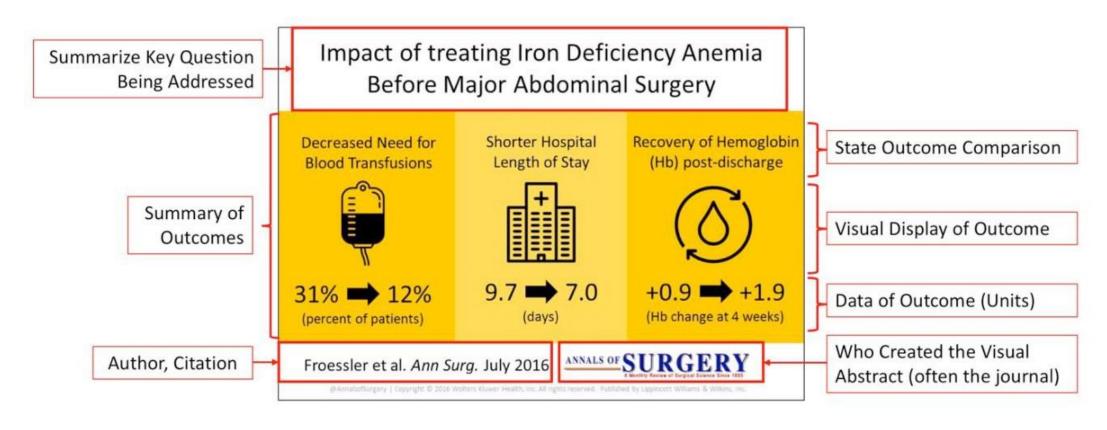
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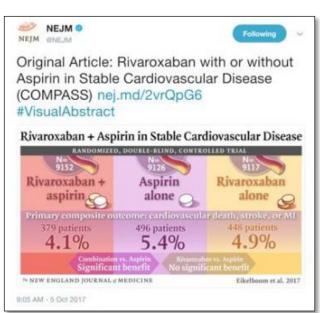
## Graphical abstract 제작방법

- Graphical Abstract 유형
- GA 필요한 콘티 설정하는 방법
- Adobe Illustrator Tool익히기(그림관련 Tool)
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- library 를 활용한 이미지 제작방법
- 통계(SPSS, R, Prism) vector 추출방법
- Target 저널 유형에 맞춰 이미지 추출방법

### **Graphical Abstract**

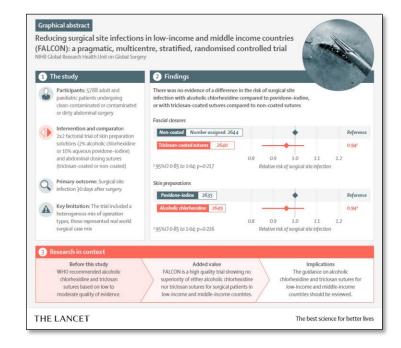
#### COMPONENTS OF AN EFFECTIVE VISUAL ABSTRACT











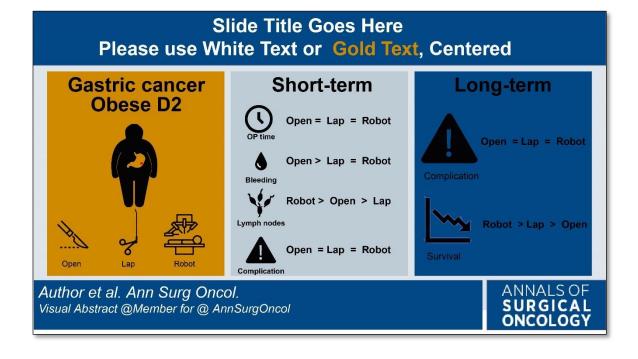
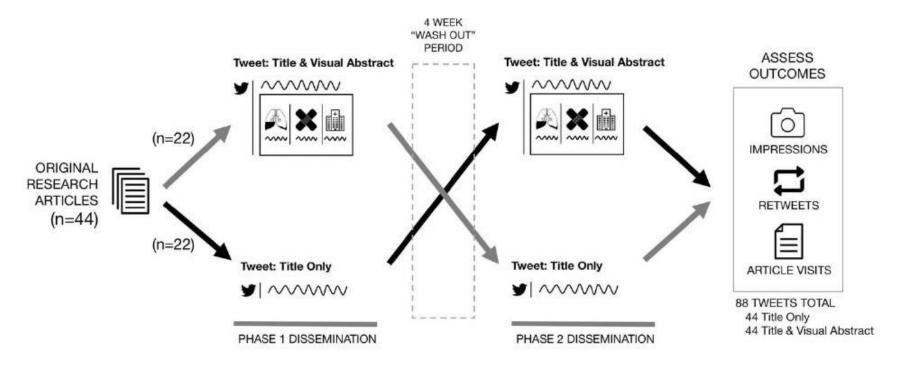


Figure 1. Study Design. Prospective, Case-Control Crossover Study to Evaluate the Impact of Visual Abstracts on Twitter

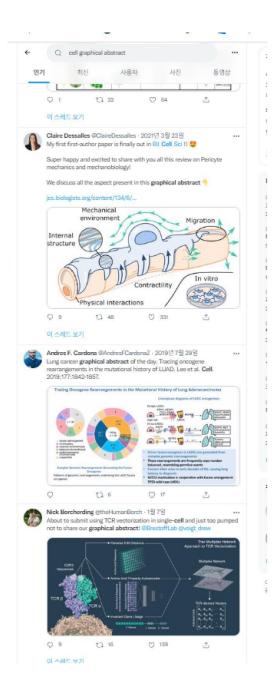


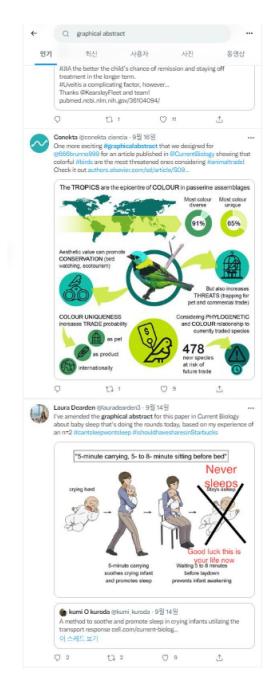
Study conducted between July 2016 and December 2016 using articles published the same year. All articles in this study were tweeted from the Annals of Surgery account (Twitter: @AnnalsOfSurgery). Outcomes data were aggregated from Twitter Analytics and compared using matched-pair t-test analysis.

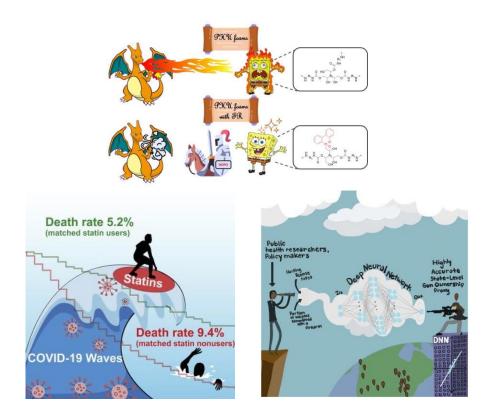
TABLE 1. Case-control Crossover Results: Title Alone Versus Title with Visual Abstract						
Outcomes (Mean)	Title Alone (n = 44)	Title with Visual Abstract (n = 44)	Increase of Outcome with Visual Abstract	P*		
Impressions	3073.3	23611.2	7.7 fold	< 0.001		
Retweets	11.0	92.1	8.4 fold	< 0.001		
Article visits	65.6	175.4	2.7 fold	< 0.001		

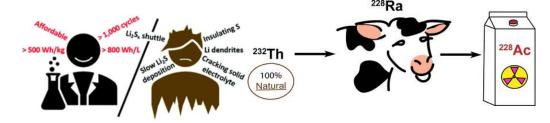
<sup>\*</sup>Comparison of means using matched-pair t test analysis comparing 88 total tweets from 44 articles in the case-control crossover study.

Definitions: Impressions (number of times tweet is seen), Retweets (number of times a tweet is shared), article visits (number of times link to article was clicked from tweet).









Open Access Review

#### New Immunometabolic Strategy Based on Cell Type-Specific Metabolic Reprogramming in the Tumor Immune Microenvironment

by 4 Ji-Yong Sung 1.\* ≥ and 2 Jae-Ho Cheong 2.3.4.\* ≥

- Department of Laboratory Medicine, Yonsei University College of Medicine, Secul 03722, Korea
- <sup>2</sup> Department of Surgery, Yonsei University College of Medicine, Secul 03722, Kcrea
- Yonsei Biomedical Research Institute, Yonsei University College of Medicine, Seoul 03722, Korea
- Department of Biochemistry & Molecular Biology, Yonsei University College of Medicine, Seoul 03722, Korea
- \* Authors to whom correspondence should be addressed.

Academic Editor: Piotr Dziegiel

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Received: 7 January 2022 / Revised: 17 February 2022 / Accepted: 21 February 2022 / Published: 22 February 2022

(This article belongs to the Special Issue New Aspects of Targeting Cancer Metabolism in Therapeutic Approach)

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Citation Export

#### Abstract

Immunometabolism is an emerging discipline in cancer immunotherapy. Tumor tissues are heterogeneous and influenced by metabolic reprogramming of the tumor immune microenvironment (TIME). In the TIME, multiple cell types interact, and the tumor and immune cells compete for imited nutrients, resulting in altered anticancer immunity. Therefore, metabolic reprogramming of individual cell types may influence the outcomes of immunotherapy. Understanding the metabolic competition for access to limited nutrients between tumor cells and immune cells could reveal the breacht and complexity of the TIME and aid in developing novel therapeutic approaches for cancer. In this review, we highlight that, when cells compete for nutrients, the prevailing cell type gains certain advantages over other cell types; for instance, if tumor cells prevail against immune cells for nutrients, the 'ormer gains immune resistance. Thus, a strategy is needed to selectively suppress such resistant tumor cells. Altrough challenging, the concept of cell type-specific metabolic pathway inhibition is a potent new strategy in anticancer immunotherapy. View Full-Text

Keywords: immunometabolism; tumor microenvironment; metabolic reprogramming; immune checkpoint inhibitor

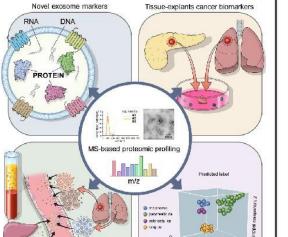
▼ Show Figures





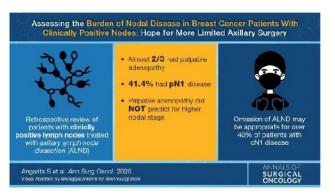
## Bacteria with facial expressions Free Vector https://www.freepik.com/ **Herpes Virus** 1 Q bacteria Ø Category Showing results for lung & Quick edit

#### 5.5 inch



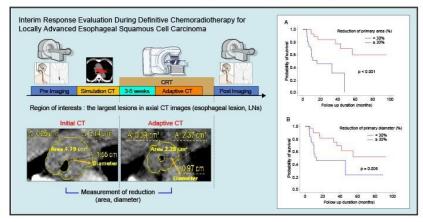
Classify primary tumor of origin

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# 7.5 inch

#### 7.7778 inch (1100 pixels)



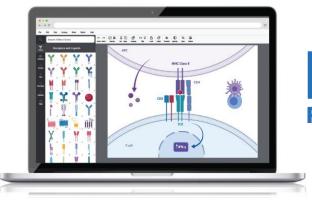
5.2778 inch (560 pixels)

Plasma cancer biomarkers

# 5.5 inch

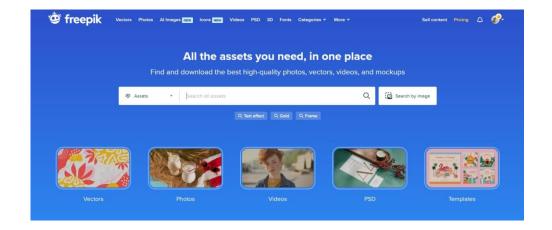
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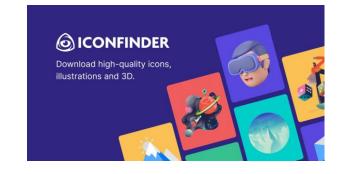


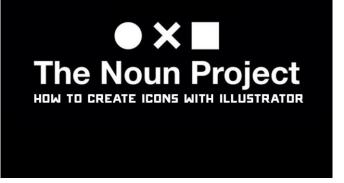


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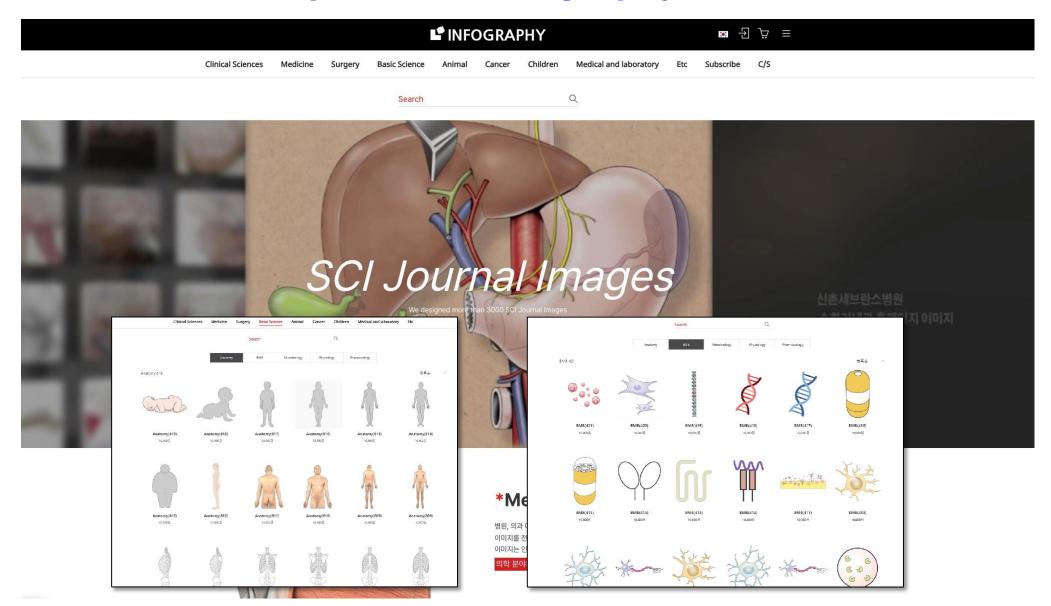




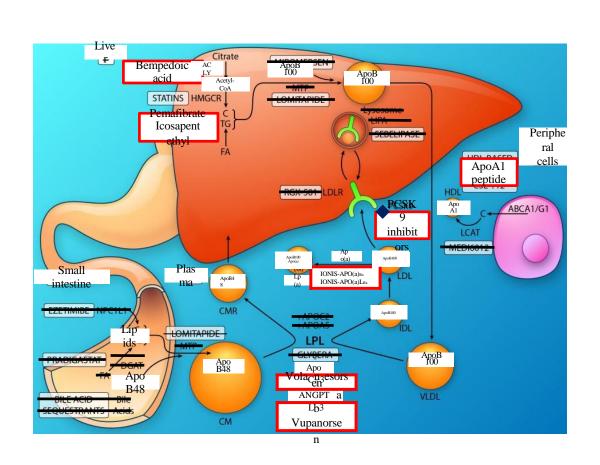


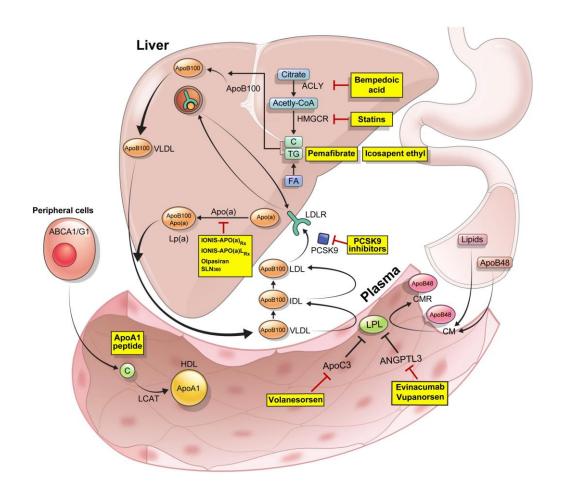


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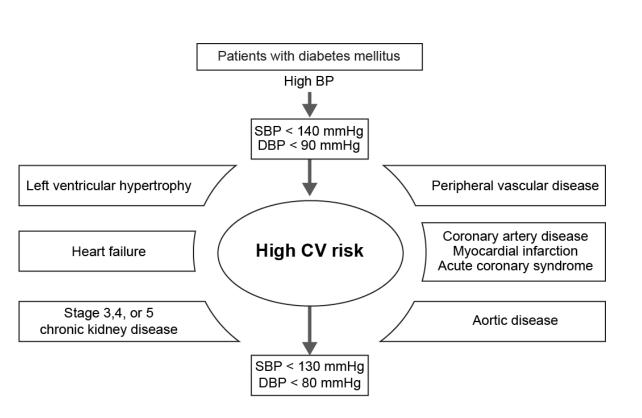


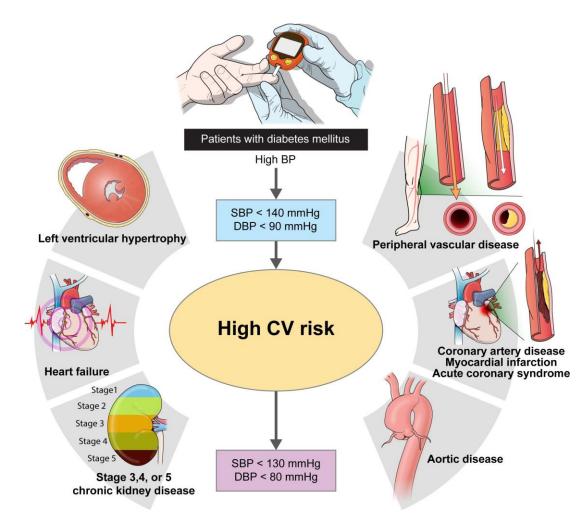
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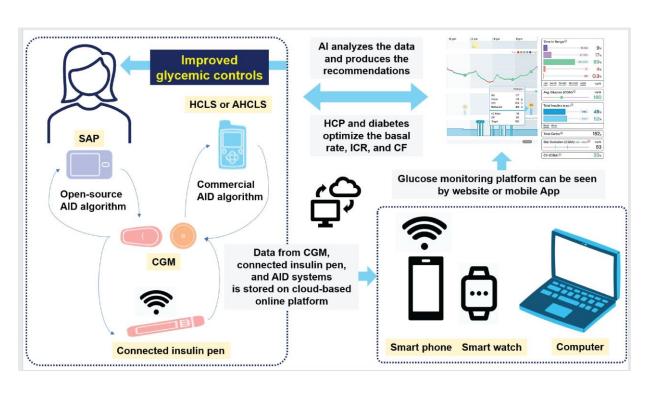


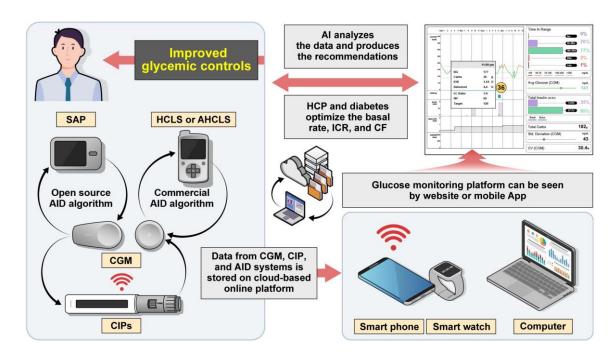
## **Before** After



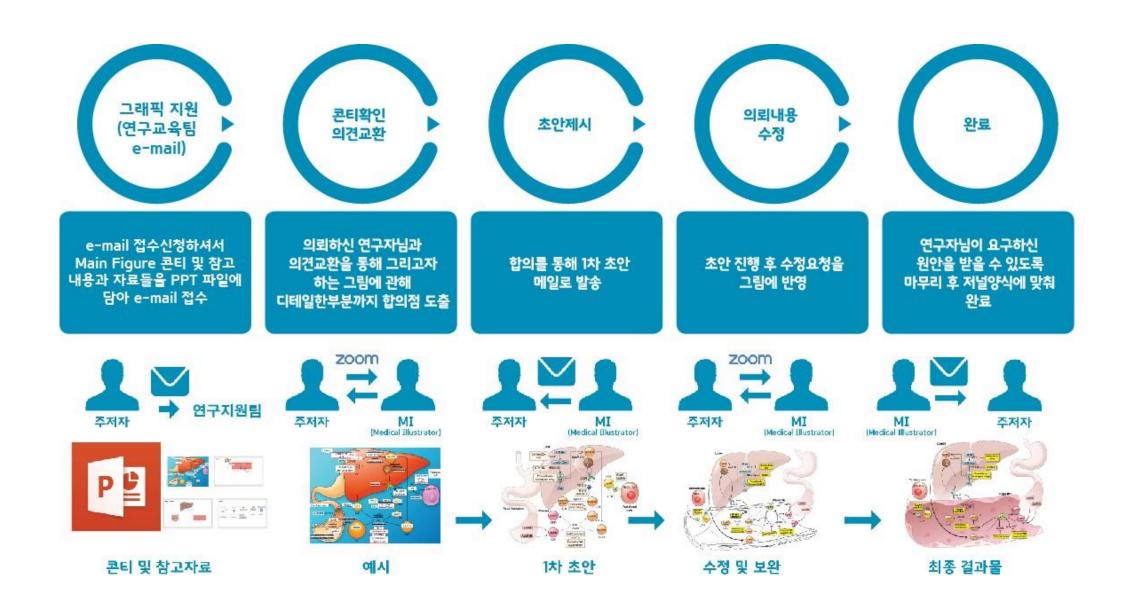


## **Before** After



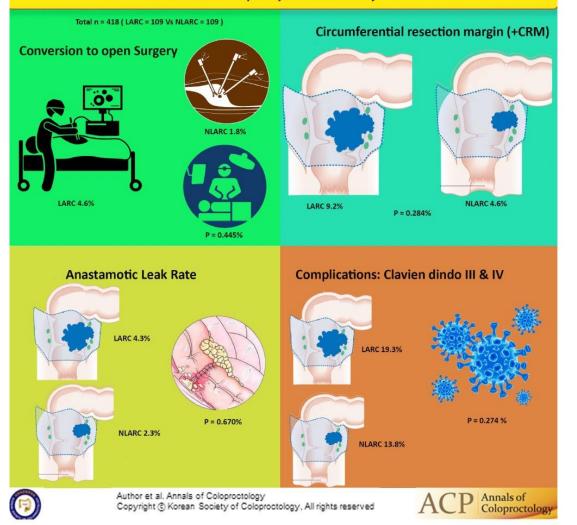


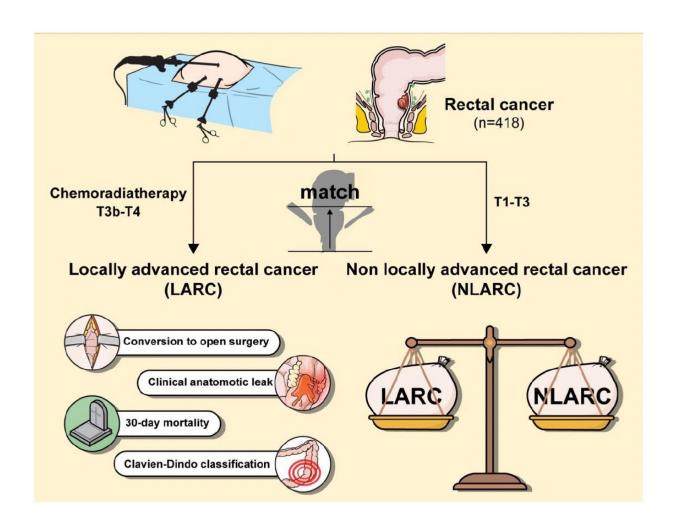
## 작업 진행 과정





Spotlight on Laparoscopy in the Surgical Resection of Locally Advanced Rectal Cancer
Multicenter Propensity Score Match Study







## Colorectal surgical management of colitis induced by vasculitis in the absence of inflammatory bowel disease: a case report and literature review

Jessica A. Paynter<sup>1,2</sup>, Kirby R. Qin<sup>3,4</sup>, Georgia Seamer<sup>2</sup>, Ruchira Fernando<sup>5</sup>, Janelle Brennan<sup>2,4</sup>, Chun Hin Angus Lee<sup>1</sup>

Department of General Surgery, Bendigo Health, Bendigo, VIC, Australia

Monash University School of Rural Health Bendigo, Bendigo, VIC, Australia

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\*Department of Urology, Bendigo Health, Bendigo, VIC, Australia \*Australian Clinical Laboratory Pathology, Bendigo, VIC, Australia

Colitis caused by vasculitis is a rare and poorly understood pathology. Little evidence exists on its clinical presentation, path to diagnosis, and surgical management. In this report, we present a case report and literature review. A healthy 20-year-old male patient presented with hemorrhagic colitis requiring total colectomy with end ileostomy. Pathological examination showed pancolitis with multiple ulcers, transmural inflammation, hemorrhage, and microvascular thrombosis. Extensive serological testing revealed elevated cytoplasmic antineutrophil cytoplasmic antibiody (c-ANCA) and eosinophilia, leading to a diagnosis of eosinophilic granulomatosis with polyangiitis (EGPA) and vasculitis-induced colitis. A literature review was subsequently conducted. Nineteen studies were found documenting vasculitis-induced colitis in dassence of inflammatory bowed disease (IBD). Systemic signs of vasculitis, hemorrhagic colitis, and progression to fulminant colitis were present. Of all patients, 40.0% required colorectal surgery and 62.5% of those patients received a stome colitis and progression to fulmination derived the colitis and progression to fulmination derived the

Keywords: Colitis; Vasculitis; Colorectal surgery; General surgery

#### INTRODUCTION

Colitis is inflammation of the colon, which can be acute, self-limiting, or chronic. Colitis can be caused by a number of conditions, which are broadly subtyped into autoimmune, infections, isch-

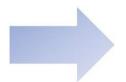
Received: Aug 19, 2022 • Revised: Sep 24, 2022 • Accepted: Oct 8, 2022 Correspondence to: Jessica A. Paynte, MBBS (Hons), BMedSc (Hons) Department of General Surgery, Bendigo Health, 100 Barnard St, Bendigo, VIC 3500, Australia

Email: jess.paynter@monash.edu ORCID: https://orcid.org/0000-0002-5888-7391

This is an open-access article distributed under the terms of the Creative Common Attribution Noncommercial License (https://creativecommons.org/license/by-nc/4.0) which permits unvestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited. emic, latrogenic (e.g., diversion or radiation colitis), or microscopic. Vasculitis can cause ischemic colitis due to the involvement of mesenteric arteries and veins for even smaller vessels] [1]. Collitis is a core component of inflammatory bowel disease (IBD). IBD includes 2 conditions: ulcerative colitis (UC) and Crohn disease (CD). Particularly in UC, colitis can acutely manifest with fulminant colitis and toxic megacolon [2, 3]. An acute colitis flare is commonly managed with anti-inflammatory and immunosuppressive agents, with potential progression to surgical management if the disease progresses to fulminant colitis or toxic megacolon [4]. As IBD is believed to be an immune-mediated inflammatory disease, patients with IBD have an elevated risk of developing autoimmune diseases, including vasculitides [5]. Many studies have explored the propensity for vasculitides in IBD to cause colitis independently [6–9]. Betheet disease is an IBD to cause colitis independently [6–9].

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## ACP New Design from Aug 2023





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### Total neoadjuvant therapy for rectal cancer: evidence and challenge

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Recent advances in the management of rectal cancer have dramatically changed the clinical practice of colorectal surgeons because the main focus of rectal cancer treatment has changed from sphincter-saving to an organ-preserving strategies. Modifying the delivery of systemic chemotherapy to improve patients' survival is another progress in colorectal cancer management, known as total neoadjuvant therapy (TNT). TNT is a new strategy used by colorectal surgeons to improve the quality of life and survival of patients after treatment. TNT poses limitations or obstacles, such as overtreatment issues in patients with stage I rectal cancer. However, considering the quality-of-life issues in patients with low-lying rectal cancer necessitating a permanent colostomy, the indication for TNT will be expanded. This review summarizes the recently conducted clinical trials and foresees future perspectives on TNT.

Keywords: Rectal neoplasms; Consolidation chemotherapy; Induction chemotherapy; Neoadjuvant therapy; Total neoadjuvant therapy

#### INTRODUCTION

Advanced rectal cancers were traditionally treated with neoadjuvant chemoradiation therapy (nCRT) followed by total mesorectal excision (TME) and postoperative adjuvant chemotherapy [1, 2]. This multimodal approach significantly improved local control; however, overall survival did not improve, mainly due to distant metastasis after the surgery [3]. Marginal or poor overall survival resulted from micrometastatic disease during the waiting period after the nCRT to surgery and poor compliance with postoperative adjuvant chemotherapy.

Recent evidence has shown a good prognosis when patients achieve pathologic complete response (pCR) after nCRT [4, 5]. The current rectal cancer management should be extended to achieve more pCR and apply the organ-preserving strategy beyond the sphincter-preserving surgery because it harbored many disadvantages, such as low anterior resection syndrome, sexual and voiding difficulties, and permanent colostomy [5, 6].

Various approaches have been tested to improve the survival of rectal cancer patients and have resulted in promising outcomes. A new treatment strategy named total neoadjuvant therapy (TNT), consists of chemotherapy given before or after the CRT to control micrometastatic disease earlier and improve compliance with chemotherapy.

The year 2022 will be a landmark year for the treatment of rectal cancer because the mainstream of rectal cancer management has been changed from nCRT to TNT. The National Comprehensive Cancer Network (NCCN) guideline endorsed the TNT strategy for the circumferential resection margin (CRM) threatening and CRM-negative tumors in the 2022 guideline [7]. These dra-

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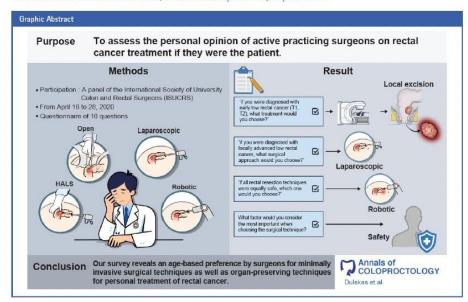
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## International Society of University Colon and Rectal Surgeons survey of surgeons' preference on rectal cancer treatment

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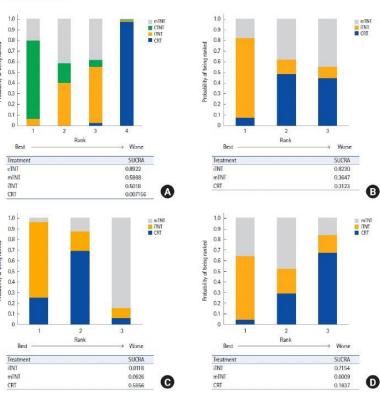


Fig. 4. Ranking plots for the efficacy of the comparison of outcomes among different neoadjuvant regimens. (A) Pathologic complete response. (B) Overall survival. (C) Local recurrence rate. (D) Metastasis rate. SUCRA, surface under the cumulative ranking curve. CRT, chemoradiotherapy; TNT, total neoadjuvant treatment; cTNT, long-course CRT (50–54 Gy) followed by consolidation chemotherapy; fTNT, induction chemotherapy followed by CRT (50–54 Gy) and capecitabine; mTNT, short-course radiotherapy (25 Gy) followed by consolidation chemotherapy.

#### Methodological quality

The patients or researchers in the studies included in the meta-analysis were not blinded in any of the publications. The details of randomization and allocation into groups were not available in some studies. A summary of the RoB is demonstrated in Fig. 9. The RoB for all enrolled studies is shown in Fig. 10.

#### DISCUSSION

The combination of CRT and optimal surgical techniques has significantly improved the treatment outcomes of patients with nonmetastatic cancer of the mid and low rectum. This combined approach enables local control of disease to be achieved in most patients with stages II to III rectal cancer, although the 5-year OS rate in stage III does not exceed 70% to 76%, due to distant metastases. This fact confirms the importance of early administration of systemic treatment [1, 26, 27].

Standard protocols for the treatment of patients with stage III rectal cancer recommend systemic chemotherapy in the postoperative setting [28], though these recommendations are based on the results of clinical studies of adjuvant chemotherapy for colon cancer [29, 30]. The role of systemic chemotherapy in the treat-

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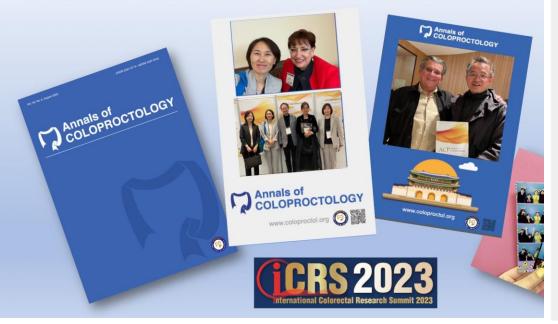
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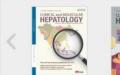
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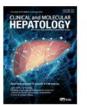






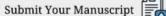


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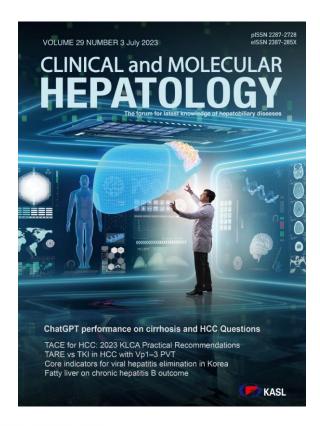
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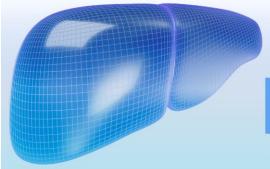
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